



CAMP CYPRUS

ENVIRONMENTAL ECONOMICS ACTIVITY

ENVIRONMENTAL ECONOMICS PILOT APPLICATION CASE STUDY

SOUTHERN LARNACA COASTAL AREA



Prepared by
Glafkos Constantinides, PAP RAC Consultant
Savvas Maliotis National Consultant

December 2007

The PAP/RAC Consultant Mr Glafkos Constantinides and the National Specialist Mr Savvas Maliotis wish to acknowledge the support of the **Environment Service of the Ministry of Agriculture, Natural Resources and Environment of the Republic of Cyprus** to **CAMP Cyprus** Project in the capacity of National Implementing Authority.

Particular thanks are expressed to the **Planning Bureau of the Ministry of Finance** which acted as lead agency for the Environmental Economics Activity, the Team Leaders and staff.

Above all, thanks are extended to the EE Activity Team for their support and contributions.

Ms Egli Pandelakis, Economic Director and Team Leader, Planning Bureau
Ms Georgia Christofidou, Senior Economic Planning Officer, Co-Team Leader, Planning Bureau
Ms Joanna Constantinides, CAMP Cyprus National Coordinator, Environment Service
Mr Giannis Gregoriou, Team Member, Planning Bureau
Ms Alexia Georgiadou, Team Member, Department of Town Planning and Housing
Mr Varnavas Pashioulis, Team Member, Department of Lands & Surveys
Ms Athena Metaxa, Team Member, Cyprus Tourism Organization
Mr Spyros Stephanou, Team Member, Water Development Department
Ms Panayiota Hadjigeorgiou, Team Member, Water Development Department
Ms Stavrini Theodosiou, Coastal Unit, Public Works Department
Ms Marilena Kythreotou, Team Member, Department of Statistical Services, Ministry of Finance
Ms Christalla Costa, Team Member, Department of Agriculture
Mr Christoforos Pandeli, Team Member, Secretary of Pervolia Local Authority

Acknowledgement is also extended to the **Priority Actions Programme (PAP/RAC)** of UNEP's Mediterranean Actions Programme for their diverse contributions to CAMP Cyprus under which this Activity is implemented.

Table of Contents

ABSTRACT

1.0 BRIEF DESCRIPTION OF THE AREA – THE ENVIRONMENTAL PROFILE

2.0 CHOICE OF THE CASE STUDY AREA

3.0 SPATIAL PLANNING ZONING REGULATION IN THE AREA

3.1 Building development zoning

3.2 Foreshore protection

3.3 Pressure on the coast – Population and Housing Density

3.4 An overall picture of coastal pressure in Cyprus

4.0 THE ECONOMY OF THE AREA

4.1 Executive Summary of the Economic Profile

4.2 The Urbanisation process

4.3 Agriculture & farming in the Pilot Area

4.4 The tourism sector

4.6 Industry (including small workshops)

4.7 Wholesale and Retail trade

4.8 Public administration, Education and Health

4.9 Other economic activities

5.0 WHY AN ENVIRONMENTAL ECONOMICS STUDY – ITS PURPOSE

6.0 THE VALUE OF ENVIRONMENTAL RESOURCES IN THE CASE STUDY AREA

6.1 Valuation methodology and Approach

6.2 Consolidated Results - The Benefits of the Coastal Environment

6.3 More general observations

6.4 Applying the visitor value to a wider area – ‘benefit transfer’

7.0 ENVIRONMENTAL MANAGEMENT AND POLICY ISSUES

7.1 From local resource valuation to policy: Development / Environment policy issues

7.2 Assessing Development challenges

7.3 Assessing Conservation challenges

8.0 THE USE OF INSTRUMENTS

9.0 LOCAL COMMUNITY FINANCE

10.0 SUMMING UP

ANNEXES

Annex I Area Economic profile supporting documents

Annex II Willingness To Pay Survey (Social Valuation)

MAPS

ABSTRACT

This Case Study focuses on the Southern Larnaca Coastal Area, in Cyprus, and includes the communities of ***Pervolia, Meneou and Kiti***. It is prepared within the framework of the Environmental Economics Activity under the CAMP Cyprus Project, which extended from May-December 2007. The main objective of the Case Study is to demonstrate how key concepts and principles of Environmental Economics are applied to a local coastal area to highlight three important issues involved in *Integrated Coastal Zone Management*:

- The approach taken to assess the economic and social values of the coastal environment,
- The type of data used to measure these values, and
- The importance of the results of such analysis for informing policy making and addressing the challenges involved in coastal development and resource conservation choices.

These issues viewed from the perspective of Environmental Economics offer new insights into the Cyprus coastal planning process complementing the existing physical-biased land use planning system.

This is the first such Study undertaken in Cyprus, and not many have been made in the Mediterranean¹. This has been a major consideration underlying the inclusion of Environmental Economics as one of the Activities under CAMP Cyprus. In this sense at least, this Case Study makes a specific contribution to the scope of CAMPs in improving the tools available for *Integrated Coastal Area Management (ICAM)*.

The preparation of the Case Study is a follow up of, and guided by, two previous activities implemented as part of the Environmental Economics Activity within CAMP Cyprus, namely:

- (a) The *Workshop* of May 2007 held at the Planning Bureau presenting and discussing with the assistance and active participation of an enlarged Activity Team the fundamental principles and issues of Environmental Economics, and
- (b) The *Environmental Economics Guidelines* Document circulated to and discussed with the Activity Team in June 2007.

¹ Three Case Studies may be cited here which focus specifically on the economics of local coastal areas in the Mediterranean: The *Study of Izmir bay* (T.I Balkas & F. Juhasz, 1993), the *Study of the Island of Rhodes, Greece* (Gl. Constantinides, 1993) and the *Study of the Coast of Israel* (Zenovar Consultamnts, 2000 under CAMP Israel). A few broader Studies covering a wider range of environmental degradation concerns including those pertaining to the management of coastal resources are those prepared within the broader framework of the World Bank '*Coast of Environmental Degradation (COED) Project*' in Lebanon, Egypt, Algeria and Morocco (2002). A significant recent review study has been prepared by PAP-RAC for the SMAP III Project *Protecting Coastal Zones in the Mediterranean, An Economic and Regulatory Analysis* (Markandya et.al, 2006).

The outcome of this Case Study is expected to provide working knowledge of Environmental Economics in Cyprus particularly in the following areas:

- In the use of *methodologies* for generating ‘missing’ information on the benefits of coastal resource conservation,
- In promoting *public awareness* of the value of coastal resources and of the risks of loss of social and economic value through excessive development,
- In presenting *justification* for setting limits to development (and to conservation) in pursuing coastal management strategies that seek to harmonize development and conservation objectives,
- In the use of *Economic Instruments* to correct distributional effects and increase financial resources in implementing spatial planning and environmental management strategies.

1.0 BRIEF DESCRIPTION OF THE AREA – THE ENVIRONMENTAL PROFILE

1.1 Resources of the Pilot area

Our observations have indicated a number of key resource factors that distinctively characterise the Pilot Area and to a greater or lesser extent influence the structure of its economic profile. Such influences could be both on a positive (supportive) side or negative where the influence relates to the absence of primary resources. These environmental or resource factors are briefly summarised below:

(a) Coastal related environmental factors

- A fairly flat coastal plain with a contouring pattern of less than 10m in most cases (Pervolia medieval Tower stands at 20m as one of the highest points) that stretches along an inward radius of 5-8kms providing substantial land for both development and agriculture that requires a minimum initial utilisation cost
- Two elongated coastal lines of around 13kms stretching eastwards and westwards of Cape Kition (see maps and pictures – Annex 1 and 2). These coastlines are regarded as safe for a wide range of sea sport activities and clean according to the recent report of Sea Water quality published by the Department of Environment – reference made to data from Pervolia sampling point).
- A mild microclimate characterized by higher than inland areas, winter temperatures and lower daily summer temperatures. The relative humidity is higher than inland areas but given its coastal location it can be termed as reasonable since it does not exceed 60%.
- A low density of housing that currently blends well with wide open agricultural land
- The salt lake complex is a region of major environmental value for the ecosystem of the area
- Community specific lack of good quality underground water supplies that can satisfy demands for drinking and/ or irrigation purposes could be termed as a negative resource factor affecting mainly the agricultural sector.

(b) Area specific factors

- Flat and fertile agricultural land stretching inwards reaching the edge of the Pilot area
- Significant agricultural land is available at Dromolaxia but a great percentage of the land is owned by the Turkish Cypriot community
- Availability of desalinated drinking water supplies from the nearby Larnaca Desalination Plant
- Availability of low cost irrigation water supplies from the nearby Larnaca Sewage Treatment facility that can irrigate more than 1.500ha of animal crops
- Short distance (less than 15 kms) and good road network of the Area from the Larnaca Urban centre for commuting purposes
- Presence of important archaeological and cultural sites
- An existing supportive infrastructure based on a complex of nearby village communities that can support further tourist and housing development
- Short distances of the area from three major urban centres (Nicosia, Limassol, Larnaca) that can act attract day visitors and second home owners.

2.0 CHOICE OF THE PILOT APPLICATION CASE STUDY AREA

The overriding aim of *CAMP Cyprus* is to develop a framework for Integrated Coastal Area Management in Cyprus to act as a tool to improve policy level responses to the need for achieving on-going sustainable coastal management covering the coast of Cyprus as a whole. **However, within the broad island-wide scope of *CAMP Cyprus*, a local spatial dimension is incorporated by the preparation of Pilot Case Study Application, such as this one, to show how the principles and methods underlying specific ICAM tools (in this case Environmental Economics) are applied in practice at the local level showing, among other issues, the data requirements, measurement techniques, the policy issues involved and the lessons learned in order to facilitate the incorporation of tools in the planning process.**

This Case Study focuses on the Southern Larnaca Coastal Area, in Cyprus, and includes the communities of ***Pervolia, Meneou and Kiti***. However, it also includes, main for important issues of comparison, the southern edges of the expanding Larnaca housing area fronting on the Salt Lakes and the 'inland' community of Dromolaxia. (See **Map1**)

Map 1

Pilot Application Case Study Area



2.1 The choice of the Pilot Case Study Application Area

The choice of the Area was determined by the following criteria:

- The presence of multi-sectoral coastal policy issues (tourism, environmentally sensitive areas, housing development, agriculture, infrastructure development, etc.).
- The presence of areas of ecological importance and existing or potential development / conservation policy conflicts.
- The presence of interacting urban and rural land uses and multi-level administrative responsibilities (Ministries, Municipalities and Village Authorities).
- Willingness of the local communities to cooperate.
- Applicability of the results to other areas.

The rationale for the choice of the 'South Larnaca peri-urban coastal area' was presented at and approved by the CAMP Cyprus *Inception Workshop of January 2006*. At the Inception Workshop as well as at the Workshop of May 2007 the choice was further explained stressing that the choice of a local area for the Environmental Economics Case Study Area, comprising only a few coastal communities, as opposed to a larger area or perhaps the whole Larnaka District, presents particular advantages,

from the standpoint of Environmental Economics, allowing the Study to address a number of important objectives:

- To focus closely on *specific environmental resources* and their value (beachfront, coastal agricultural land, Salt Lakes, open natural beach area, etc.);
- To collect and analyze *specific data on economic activities* comprising the local economy and their links with the coastal environment;
- To identify and measure the *type, extent and value* of the social, economic and environmental benefits of the coastal environment in as specific terms as possible, currently missing in the Cyprus policy framework except in very general and abstract qualitative terms;
- To identify more closely specific policy issues of wider importance yet applicable to other areas (coastal conservation, zoning expansion, the use of fiscal instruments);
- To achieve the desired results within the limited time (May-December 2007) and available resources.

3.0 SPATIAL PLANNING ZONING REGULATION IN THE CASE STUDY AREA

3.1 Land use and building development control zoning

Building development in the area of the Case Study is regulated by the provisions of the Countryside Policy Development Plan (under the *Town & Country Planning Law* of 1990) which includes, among other things, zoning comprising the following:

Table 1.1 Case Study Area Zoning Controls (Plot ratio standards)

Zoning	Plot ratio ceiling	Maximum site coverage	Maximum No of floors
Village Housing Zones			
Core village areas (H1)	1.20 :1	0.70 :1	2/3
Village expansion areas (H2)	0.90 :1	0.50 :1	2
Outer village fringe areas (H3)	0.60 :1	0.35 :1	2
Protection Zones			
Areas of special heritage interest) (P1)	0.15:1	0.15:1	1
Agricultural areas (Z1)	0.06:1	0.06:1	2
Environmentally sensitive areas (Z3) (Water drainage areas, Cape Kiti)	0.01:1	0.0:1:1	1
Tourism zones (T2a)			
Coastal hotels	0.45:1	0.20:1	3
Tourist villages	0.40:1	0.20:1	2
Coastal housing	0.20:1	0.20:1	2
Tourist zone (T2b1)			
Coastal hotels	0.40:1	0.20:1	3
Tourist villages	0.30:1	0.20:1	2
Coastal housing	0.10:1	0.10:1	2
Tourist zone (T2e)			
Coastal hotels	0.45:1	0.20:1	3
Tourist villages	0.40:1	0.20:1	2
Coastal housing	0.30:1	0.20:1	2

Note: Plot ratio is used as an index of building density and refers to ‘the ratio of allowable building volume to the area of the site’.

The following brief comments are added for clarification:

- Coastal holiday housing, which is the predominant land use in the coastal zone, is given higher building / plot ration (0.30:1) in zone T2e in 3 sections along the Pervolia coastal front. Along the rest of the coastal zone the building / plot ratio drops to (0.20:1 and (0.10:1).
- The Pervolia irrigated land re-allotment / consolidation area is given a low 0.06:1 building / plot ratio, yet allowing building development up to that limit.
- Environmentally sensitive areas (Z3) are protected by a very low building plot ratio of 0.01:1 which is essentially prohibitive for building development.

3.2 Foreshore protection

Along the coast, a building setback line is set at a distance of 100 yards from the shoreline under the *Foreshore Protection Law*. Within this zone no building development is allowed except very rarely for light structures (sheds, footpaths, etc.), after approval by the Council of Ministers following recommendation by the District Officer and on advice by the Director of the Department of Town Planning and Housing. Complications occur however due to coastal erosion that washes the shoreline closer to the land.

3.3 Pressure on the coast – Population and Housing Density

Table 1.2 Coastal length, population and tourist beds in the Case Study Area and in other coastal areas

Area	Length of coast (km)	Population (2002)	Population per km of coast
Case Study Area Meneou, Pervolia, (excluding Softathes in Kiti)	9	14,340 *	1,593
Limassol LP Area	20	151,000	7,550
Larnaca LP Area	15	75,300	5,020
Paphos LP Area	30	46,300	1,543
Ayia Napa – Paralimni Municipalities	20	38,000	1,900

Source: CAMP Cyprus Project Research (LP Area = Local Plan Area)

* Population estimate: 2,050 coastal holiday houses x 4 persons per house = 8,200 summer population plus 6,140 village resident population.

Two main points are important here:

- Coastal pressure in the Case Study Area is lower relative to the urban coastal towns of Limassol and Larnaca, but due to the concentration of holiday houses along a small coastal area of 9 km., close to the overall population density in Paphos and Ayia Napa and Paranimni.

- Holiday housing development has occurred mainly after 1992, speeding up closer to 2002 and more rapidly towards 2006, as shown in the following table. Housing density increased by 85% in Pervolia and by 90% in the area as a whole, between 1992-2002., jumping to 173% and 150% respectively since 2002. The high percentage density increases reflect the low benchmark level back in 1982.

Table 1.3 Coastal holiday housing density in the Case Study Area

Year	Pervolia village (Length of coast 7.3 km)		All 3 villages (Pervolia, Meneou and Kiti/ Softades) (Length of coast 13.0 km)	
	Houses	Density	Houses	Density
1982	12	1.64	62	4.7
1992	571	78	827	63.6
2002	1055	144	1,569	120.6
2006	1557	213	2047	157.4
Increase 1992 – 2002		85%		90%
Increase 1992 - 2006		173%		150%

At this point it is useful to show the overall distribution of tourism hotel accommodation in Cyprus relative to the share of Larnaca District to gain a perspective of the relative size of the Case Study Area.

Table 1.4 Regional Distribution of tourist accommodation capacity at end of 2005

District	No of tourist beds	Share in %
Limassol	15,876	16.60%
Larnaca (whole District)	8,533	8.92%
Paphos	28,848	30.16%
Famagusta (Paralimni & Ayia Napa)	37,957	39.69%
Total Coastal Areas	91,214	95.37%
Nicosia	2,237	2.5%
Hill Resorts	2,121	2.4%
Total	95,572	100%

Source: Cyprus Tourism Organisation

3.4 An overall picture of coastal development pressure in Cyprus

The coastal *urban* population centres in Cyprus cover a length of about 85 km. corresponding to the length of the coastal front covered by the Local Urban Development Plans of Limassol, Larnaca, Paphos and Ayia Napa-Paralimni. As shown in table 1.5 below, in these areas population increased from 202,000 in 1982 to 311,500 in 2002, an increase of 54%. The coastal *rural* population (including the population of the Case Study Area) increased from 35,000 to 50,600 during the same period, an increase of 45%, while the *total coastal population* increased from 237,000 to 362,100, an increase of 53% compared to only 21% increase of inland population, including Nicosia, and 35% increase of the total population. In short, development pressures on the broad coastal zone is increasing.

Table 1.5 Increase of population on the coastal front in the urban areas

Area	1982	1992	2002	Increase 1982- 2002
Urban Coastal Population (Limassol, Larnaca, Paphos, Paralimni and Ayia Napa (Local Plan Areas))	202,020	260,620	311,500	54.20%
Urban population density (85 km of coast / persons per km)	2,376	3,066	3,664	54.20
Rural coastal population	35,000	41,300	50,600	44.50%
Rural coastal population density (211 km of coast / persons per km)	165	195	240	44.50%
Total coastal population	237,020	301,920	362,100	52.77%
Total coastal population density (296 km of coast / persons per km)	800	1,020	1,223	52.77
Total Inland population (including Nicosia)	300,500	330,700	364,900	21.4%
Total population	512,000	602,000	689,500	34.6%

The population density in the Case Study Area is now estimated at 1,593 per km., about half of the urban coastal density and just above the overall coastal population density.

4.0 THE ECONOMIC PROFILE OF THE AREA

4.1 Executive Summary of the Economic Profile

4.1.1 Opinion overview

It is a widely accepted fact that current practises in coastal development are based on a Friedman 'laissez-faire' style of economic management. The thrust for development is guided, almost exclusively, by the goal for a monetary profit reward at the individual level. Furthermore, market forces dictate the allocation of the scarce coastal resources thus shaping accordingly the local ecosystem most often resulting in overdevelopment and subsequently to resource degradation. Otherwise stated, microeconomic factors precede macroeconomic policy tools, a practise that invariably leads to an exploitation of resources not compatible with issues of sustainability and equitable allocation of the precious coastal resources to the wider population in a sense that can maximise social welfare. Debating further on the above statement is beyond the scope of this report, yet it should be stated that the end results of coastal overdevelopment and urbanisation are nowadays widely addressed with high environmental concerns.

Unlike conservation activists, our environmental economic approach in managing costal resources accepts the need for development as a logical outcome of a free market economy. In this economic system the need for development is driven by individual profit maximisation which targets at satisfying specific groups' human needs. Correcting the market's misallocation and depletion of resources requires that policy making forms a set of rules in which microeconomic activity is confined to operate so that,

- a) Resources are made fairly and equally available to the wider public thereby maximising social welfare
- b) Sustainable use of resources is safeguarded during the process for development
- c) The competitive advantage offered by coastal resources that guides economic growth is maintained in the long run

4.1.2 Scope of the Economic Profile section report

This case study aims primarily at evaluating the impact of a coastal economic growth on environmental and resource degradation. By studying the economic profile of the selected Area and the possible correlation of key economic activities with the coastal resources, we attempt to evaluate objectively and if possible measure the economic and social benefits of the coastal resources to the economy and growth of the Area. The information generated can then provide a measurable economic and social costing instrument of the resulting overexploitation and degradation of resources. ICAM tools have to strike a balance between the dual role of coastal resources, as ecological functions and socio-economic assets. This balance must lead to sustainable development of coastal areas which in economic terms translates to maintaining a long run competitive advantage for the Area's coastal economy which would subsequently maximise economic and social welfare in time.

Hence, the main purpose of this report is to:

- Identify the main economic drivers of growth and urbanisation in the area
- Identify the type, extent and significance of the coastal environment for the local economy and society, as reflected in the contribution of the coastal environment to economic and social activities;
- Measure the main socio-economic benefits of the area's coastal environmental resources;
- Provide adequate measurable instruments to the policy maker in shaping future policy changes that will influence the use of coastal resources so that a sustainable development and a more equitable distribution are achieved.

4.1.3 Summary of findings and conclusions

The analysis for the economic profile of the Selected Area is summarised in the table below and refers to estimated GDP ranges categorised by the broad economic activities identified.

Table 4.1: GDP estimation for the Pilot Area

	Sector	Low estimate		High estimate	
		Value (Euro)	%	Value (Euro)	%
C	Agriculture	4,910,128	6	6,993,138	7
C	Farming	5,984,639	7	6,900,358	7
D	Tourism	22,621,319	28	35,542,637	34
E	Construction & Real Estate	9,860,500	12	9,860,500	9
F	Manufacturing	4,000,000	5%	7,000,000	7
G	Wholesale & Retail Trade	11,000,000	13%	13,000,000	12
H	Public Services, Health & Education	7,638,100	9	7,638,100	7
I	Other Economic Activities	3,791,955	5%	3,791,955	4%
I	Desalination Plant	11,700,000	14	13,260,000	13

I	Sewage Treatment Plant	124,200	0	185,400	0
Total		81,630,841	100	104,172,088	100
Total (Pounds)		47,776,408		60,969,214	

The Area examined may commonly be characterised as a rural, historically agricultural, coastal region. Contrary to a general tendency for urbanisation (at the expense of rural growth), the particular Area is experiencing a substantial growth in population during the last two decades and portrays a younger than average, population pyramid structure thereby signifying a net inflow of new and younger in age families. Coastal specific along with Area specific factors are the key drivers for the on-going urbanisation process of this rural Area. The two Communities of the Pilot Area, namely Pervolia and Meneou have a combined beachfront extending 8.40 kms and a tourist zone of 5 sq.km. The other two communities that form part of the coastal plain, Kiti and Dromolaxia have no beachfront area, a fact that leads into a much lower economic benefit from the overall Area's coastal resources.

In fact, the Area's GDP is dominated by the tourist activity which is however concentrated in the two coastal Communities that enjoy 95% of the total tourist GDP while the more inland Communities maintain a blend of activities with agriculture playing a dominant role at Kiti and farming at Dromolaxia. It can be stated that coastal resources including the beachfront, the attractive climate, clean seawater and the potential of possessing vacation accommodation within walking distance from the sea, contribute greatly to the Area's GDP. The structure of the tourism sector has led to a reduction of the accessible beachfront and has obstructed the sea view along the coastal road from Meneou to Pervolia. The sector's long term sustainability is also questionable due to its dependence on available coastal, tourist land for development and the likely risk of 'overcrowding' in the tourist zones of Pervolia and Meneou. As tourist and housing development advances, the area is losing on its agricultural scenery a trend that may well distort the environmental balance of the Area. It should be further stressed, that the current structure of economic growth may not necessarily lead to an equitable distribution of resources that can maximise social welfare across the Area's population.

Despite a substantial growth in tourism and a tendency towards urbanisation, agriculture and farming as the only primary activities, have maintained a sizable share (14%) of the area's GDP. Coastal specific resources (climate and land fertility) appear to have a dominating effect in shaping the agricultural profile of the area as they favour the production of specific high value - fruit and vegetable - crops (artichokes, okra, chillies, melons and watermelons), which are not cultivated in adjacent inland regions. Yet, irrigation water as a key resource element seems to impose a major constraint in agricultural production as the Area cannot be self sufficient in groundwater supplies and neither can the South Conveyor Project guarantee the demanded supplies. A major improvement in combating the problem relates to the use of treated water from the nearby Larnaca Sewage Plant (for selected animal crops). Currently only Dromolaxia growers are connected to this water supply network but as more communities discharge their residential effluents at the Plant more supplies could be made available to growers in other communities.

Water is currently the scarcest resource and demand competes between the tourist and agricultural sectors. As irrigation water supplies approach their limit, water will become an even more competitive resource between agriculture, tourism and residential use.

Policy making will soon be faced with a decision on how to efficiently allocate the treated water supplies.

Tourism and the related sectors of construction and real estate make up 46-50% of the Area's GDP (not accounting for the Desalination and Sewage Plants). Although coastal related factors are central in shaping the Area's economy, policy making should also aim at a more balanced development by supporting manufacturing and tertiary sector activities. The structure of tourism development (that gives along with construction employment to only 14% of the economically active population) and the absence of such support measures are possible factors for the high commuting rate of 77%. The associated environmental cost in terms of fuel, gas emission and the necessary road infrastructure should be further investigated with the purpose of constructing support measures that would attract industry and service sector businesses leading to job creation within the Area.

In terms of real estate, there exists a strong market on secondary home trading and our findings indicate the existence of a premium of up to 300% for housing units located on the beachfront compared to inland areas. There is also a 60% premium between beachfront locations and houses located on the back side of the tourist zone, overlooking the villages, denoting further the premium assigned by the market on coastal resources which in practise reflects the value assigned on the coastal environment by those people that want and can afford to own the asset. This value could be extrapolated on the wider population as an average premium value for the coastal assets of the area.

4.2 The Urbanisation process

4.2.1 Population growth patterns

Over the twenty year period 1982-2002 the area has experienced an average population growth of 44% while the area closer to the coast ie Pervolia, Meneou, Kiti (thereafter named as 3CPA) has experienced a population growth of 57% which significantly exceeds the registered growth rates for Cyprus urban and rural areas as illustrated in table 2 below. In terms of absolute figures, the 2002 Population Census statistics indicate that 11.131 people were permanent residents of whom 6.137 (55%) lived in the 3CPA. The population growth rate of 57% for the 3CPA exceeds also significantly the average population growth for Larnaca District (both urban and rural). The growth disparity is even more notable and verifies that it is an area specific development rather than District specific when one compares the 3CPA growth rates vis-à-vis adjacent inland communities, namely Dromolaxia, Klavdia and Kalo Chorio, suggesting that coastal factors could have a dominating impact in influencing this significant variation in population growth rates.

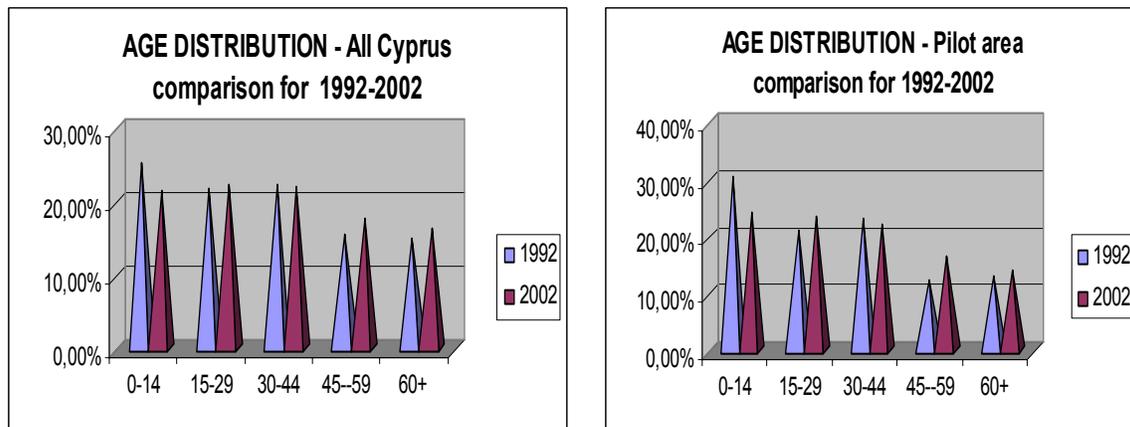
Table 4.2 includes two notable exceptions where inland communities have also experienced higher than average population growth rates, Psevdas and Kornos. This should further lead to the conclusion that factors other than coastal specific can have a positive effect on population growth patterns of rural communities. What should therefore be further examined is the impact of each area's resources on the economic growth and social welfare when comparing coastal and inland rural communities that experience sustained population growth patterns - an issue that is addressed elsewhere in this report.

Table 2: Percentage change in key population indicators 1982-2002

	Houses	Households	Population
CYPRUS Urban	83%	72%	46%
Larnaca Urban	99%	73%	46%
CYPRUS Rural	55%	25%	15%
Larnaca Rural	59%	35%	25%
Dromolaxia	52%	44%	31%
Meneou	282%	105%	83%
Kiti	91%	70%	49%
Perivolia	497%	89%	57%
Average for 4CPA	149%	63%	44%
Average for 3CPA	241%	81%	57%
Klavdia	-10%	-17%	-36%
Kalo Chorio	21%	11%	-5%
Psevdas	101%	87%	66%
Kornos	75%	60%	63%

Source: Population Censuses 1982, 1992, 2002, Statistical Service

In terms of age distribution, the trend during the decade 1992-2002, both in the 3CPA and the 4CPA (including Dromolaxia community) is closely related to the general tendency for a 'getting-older' population. The comparison depicted in the two diagrams below, suggests that the Pilot Area may not be clearly characterised as a 'young family – newly developed' area but on the other hand it is definitely not a deserted rural region.

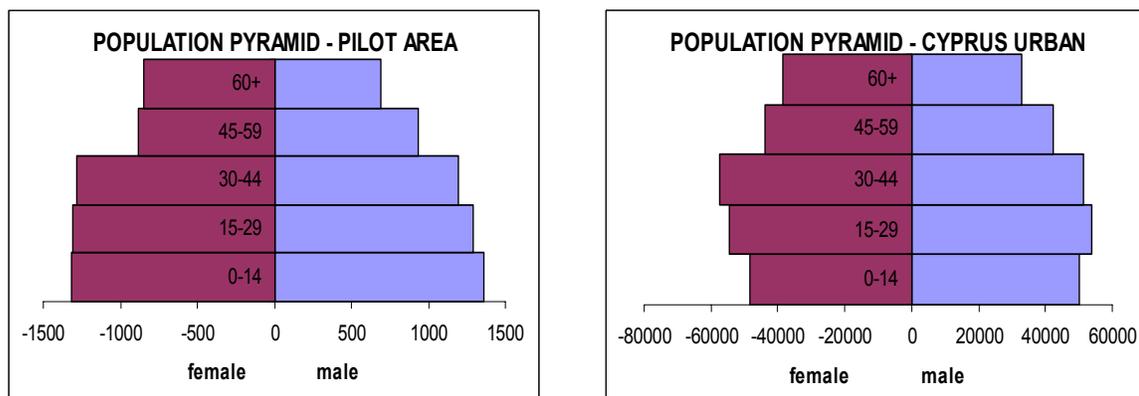


Source: Population Census 2002

Looking at the 2002 population structure, the pyramids below illustrate that the area portrays a fairly balanced blend of age and sex distribution and moreover it is a younger population pyramid compared to the pyramid structure of the Cyprus urban regions. It may therefore be concluded that the Area, is a coastal rural region experiencing a continuing influx of young family new residents, a generally uncommon characteristic of inland rural communities both in Larnaca and throughout Cyprus.

The area's population pyramid further suggests that the area is in a state of healthy population growth, implying that a number of area and/ or coastal specific factors are net

positive in attracting household migration and establishment into the area. On-site observations point out that the combination of two factors is directly related with this



population growth, namely short distance from the town of Larnaca and the coastal environment.

4.2.2 Housing

Table 4.3 confirms in percentage points the heavy housing development that took place during the past two decades in the Pervolia and Meneou Communities. In both communities the number of houses has grown respectively fivefold and threefold in 1982-2002 and our estimates (based on the actual number of individual house water meters for 2006 - table 3), indicate a further increase in housing units during the last four years by another 50% in the Pervolia area and 26% in Meneou. Meneou's lower rate of housing growth is attributed to the fact that the Community had by 2002 approached its full capacity in terms of housing development (residential and tourism).

Table 4.3: Housing comparisons 2002 / 2006

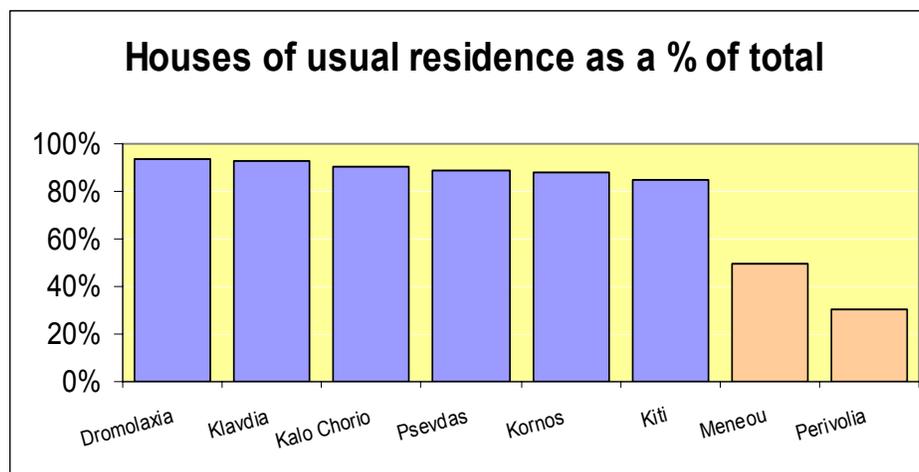
	2006 estimated figures ¹					2002 statistical figures ²			
	Total	% change since 2002	Residential housing units	Tourist housing units	Ratio of tourist units to total	Total	Residential housing units	Tourist housing units	Ratio of tourist units to total
Dromolaxia	1800	15%	1800	0	0%	1.563	1.462	10	1%
Meneou	890	28%	430	460	52%	696	348	323	46%
Kiti	1800	62%	1665	135	8%	1.113	947	105	9%
Pervolia	2726	50%	1169	1557	57%	1.819	568	1.055	58%
Total for Pilot Area	7216	39%	5064	2152	30%	5.191	3.325	1.493	29%

Sources: 1. Figures estimated using data from Area Community Councils 2. Population Census 2002

The Kiti community has also experienced a housing expansion during the period 1982-2002 approaching 91% which also exceeds significantly the average housing growth of Cyprus. The growth of housing units in this community accelerated further in the period 2002-06 growing by a further 52%. On site observations of the intense construction activity lead one to conclude that Kiti Community is currently at its peak in residential housing development, having lagged behind a few years to Meneou and Pervolia. A profound comparison is noted in housing development between the 3CPA and the

adjacent inland communities of Klavdia, Kalo Chorio and Dromolaxia where housing units have grown by less than 50% over the twenty year period (table 2).

Comparing the growth rates of houses vis-à-vis population growth in the 3CPA we further observe a marked imbalance that is better understood by referring to the graph below which shows that Pervolia and Meneou experience the lowest rate of permanent housing from the selected sample. Figures simply verify a clear cut observation of an extensive second (non-permanent) home market, a segment of economic activity that is worth investigating to a greater detail when referring to the tourism sector.



Source: Population Census 2002

4.2.3 Land Use patterns

Table 4.4: Land Use by economic activity

Land Usage	Dromolaxia		Meneou		Kiti		Pervolia	
	area sqm	%	area sqm	%	area sqm	%	area sqm	%
Industry	0.4	3%	0	0%	0.15	1%	0	0%
Agriculture	4.5	35%	1.2	32%	1.8	18%	0	0%
Protection zones	5.4	42%	0.4	11%	0	0%	0	0%
Re-allotment	0	0%	0	0%	4.5	45%	4.3	41%
Housing	2.7	21%	1.2	32%	3.5	35%	2.6	25%
Tourist	0	0%	1	26%	0.15	1%	3.7	35%
Total	13		3.8		10.1		10.6	
Population Density (people 2002/ sqm)	384		315		311		170	

Table 4.4 was compiled using data from the approved Map of the Development Plan for the Area (Town Planning & Housing Department) – Map 1. A number of key points should be noted relating to the compiled table:

- Dromolaxia land is mainly agricultural and/ or Protected while land for tourism development is non-existent. The high proportion of protected land relates to the Ramsar site of the Salt Lakes.
- Pervolia is the opposite extreme to Dromolaxia showing a very high proportion of tourist and residential zones.

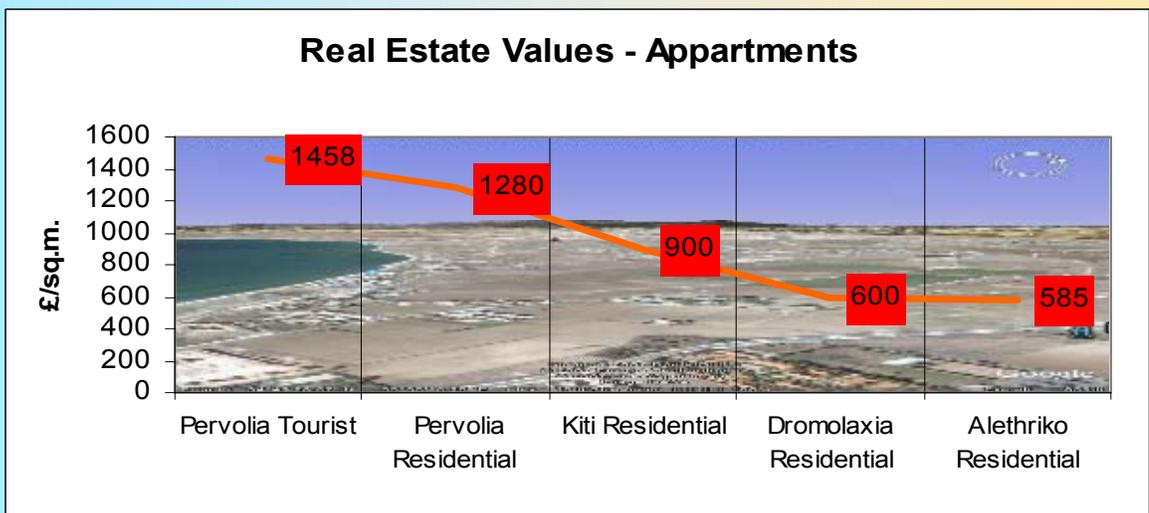
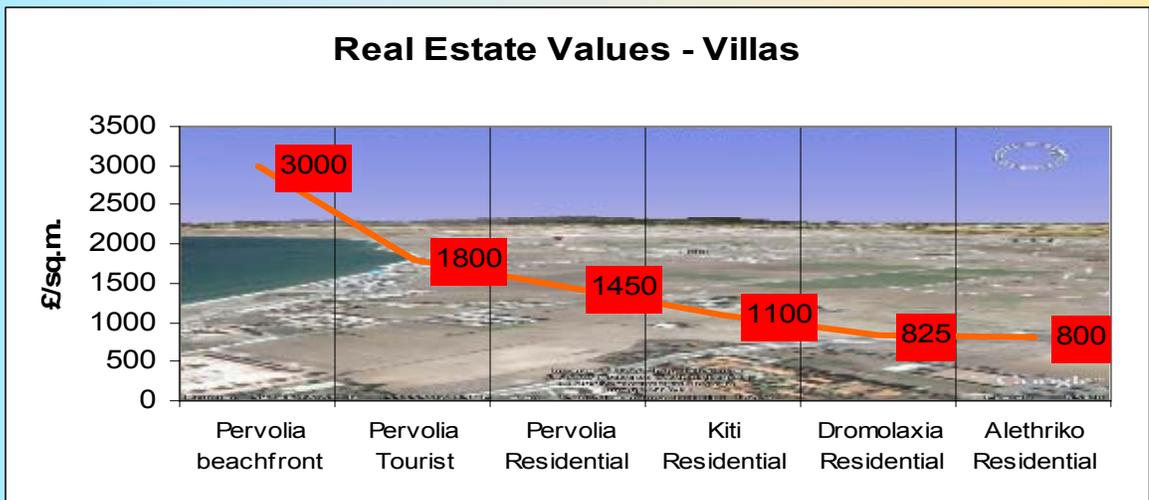
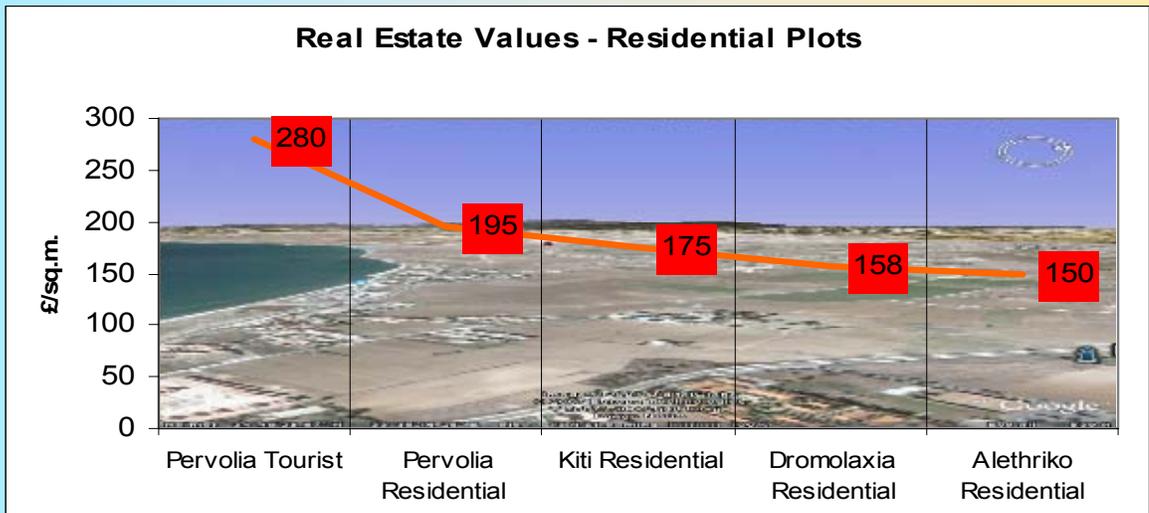
- Both Kiti and Pervolia have a sizable land allocated to re-allotment (6% housing coverage) - demands from both Communities intensify towards transferring such land into residential zones
- Meneou is the smallest of the four communities but shows a wider blend of land uses. Demands for expanding residential zones are high due to shortage of available residential land.
- Population Density is low in all communities but it is by far lowest in the Pervolia Community as a result of substantial vacation housing
- Agricultural land is mostly available at Dromolaxia village whereas Pervolia and Kiti seem to support significant agricultural activity within their Re-allotment zones.
- Although Kiti has a very small tourist zone, the inclusion of Softades (coastal region) under the control of Kiti Community Council increases its coastal front significantly.
- Land dedicated to industrial activities is very small (around 1% of the total land area and is restricted in the Dromolaxia Community plus a very small area at Kiti. Especially for the 3CPA, this creates unsolved problems for the small proprietors and industrialists of the area and shows an unorganised structure of development as these firms operate from unfit warehouses situated within residential regions in an unplanned manner.

In further examining the pattern of urbanisation we notice a development growth along the major routes that lead to the village squares, especially along the main Larnaca – Kiti road. Another substantial development pattern relates to the secondary housing complexes that expand alongside the coastal front with its boundaries edging virtually next to the beach. Meneou has a coastal front extending for 1.20km of which around 300m remains an open beach area - this however increase by 1km when combined with the open beachfront extension towards the airport which falls within the Municipality of Larnaca. Pervolia has a coastal front of 7.3 kms with a patchy tourist development along the coast. Kiti-Softades has around 3.5 kms of coastal front nearly all of which is currently un-exploited open beach area that is due however for development. This coastal front that forms part of the Softades tourist zone is currently opened up with a new road infrastructure under development and new tourist complexes are due for construction in the near future.

4.2.4 Real Estate Values

The Area is currently experiencing a boom in its real estate values, by economic terms a sign of excessive demand versus a limitation in the supply of available land for development. The thrust for development is therefore geared by the potentially huge capital profits achieved by the initial owners of coastal land and the profitability of active developers in their business target to meet the needs of a specific market segment that looks for vacation housing next to the coast.

In selecting a benchmark for valuing the coastal natural resources across the population, a logical instrument to use relates to the comparative valuation of the market price of real estate between coastal and inland regions both within and adjacent to the Pilot area. The results of this exercise are depicted in the three diagrams of Appendix 6 which have been compiled using averages from a diverse range of sources quoting market prices for real estate in the selected reference points.



It is clear that as we move from the inland areas of Alethriko (a fairly developed community) and Dromolaxia towards the coast, prices of real estate rise and the rate of price change increases as we move between points that are closer to the coast. These observations reflect,

- (a) that the supply for coastal land decreases while at the same time demand for acquiring coastal real estate increases
- (b) that real estate closest to the beachfront is valued by potential buyers at the highest, a point made explicit by the fact that in two of the diagrams the trend line becomes steeper as we approach the beachfront

It may therefore be concluded that people place a higher value for enjoying coastal environmental assets and that these assets / resources become scarcest as we approach the coastline. The combine effect of these factors pushes the supply and demand equilibrium points for coastal and beachfront areas at higher price levels than inland areas.

4.2.5 Employment

Using statistical data from the 2005 Registration of Employment (published by the Statistical Service), Table 4.5 was compiled for the purpose of evaluating the commuting profile of the Area. The table leads to the conclusion that 77% of the area's working population is employed in a different Community and hence one could term the Area as a commuting zone with its working population employed mainly in the town of Larnaca. Although this is not clearly evident from the figures (an alternative could be the case whereby there is a high intra-communities movement of people) our field work supports to a great extent the above conclusion. A further comparison of the total number of people employed between tables 5, 6 and 7 denotes clearly that, there are approximately 4.400 people eligible for work but only 1794 are employed in establishments registered in the Area, a figure that equals to a proportion of 40%.

Table 5: Commuting rate estimation

PLACE OF RESIDENCE - DISTRICT	Total employed	Municipality / Community of residence	Different Municipality / Community	Commuting rate
Larnaca	46,455	23,666	22,375	48.16%
Larnaca Urban	28,779	17,420	11,090	38.54%
Larnaca Rural	17,676	6,246	11,285	63.84%
Dromolaxia	1,939	357	1,574	81.18%
Meneou	499	70	425	85.17%
Kiti	1,226	342	870	70.96%
Perivolia	634	171	453	71.45%
Total for Pilot Area	4,298	940	3,322	77.29%

Source: Registration of Establishments 2005, Statistical Service

Table 4.6 further indicates that nearly two thirds of the workforce is employed in the tertiary sector while a percentage of 5-8% is employed in the primary sector. The blend of employment in each of the three broad economic sectors illustrates once more that the area experiences a mixture of rural and urban-like development with a high proportion of its population employed in tertiary sector activities in the town of Larnaca.

Table 6: Employment by economic activity

DISTRICT	EMPLOYMENT		ECONOMIC SECTOR		
	Total econom. Active population	Unemployment rate	Primary sector	Secondary sector	Tertiary Sector
CYPRUS	303,198	3.45%	3.59%	23.23%	72.80%
Larnaca	48,115	3.45%	4.84%	25.26%	69.68%
CYPRUS Urban	215,768	3.55%	1.17%	21.38%	77.05%
Larnaca Urban	29,843	3.57%	1.77%	23.06%	74.90%
CYPRUS Rural	87,430	3.22%	9.56%	27.78%	62.35%
Larnaca Rural	18,272	3.26%	9.86%	28.84%	61.18%
Dromolaxia	2,017	3.87%	5.31%	28.21%	66.27%
Meneou	517	3.48%	5.81%	30.86%	63.33%
Kiti	1,280	4.22%	8.40%	24.23%	67.37%
Perivolía	661	4.08%	5.84%	30.91%	63.56%
Total for Pilot Area	4,475	3.96%	6.33%	27.78%	65.84%

Source: Registration of Establishments 2005, Statistical Service

Looking at the establishments per category of economic activity, table 4.7 below reveals that the construction and real estate sectors are the leading employers in the Area giving work to around ¼ of the total people that are employed in the Area. This indicator further verifies the dominance of construction to the economy of the region but at the same time poses a serious question as to the long term viability of this profession given the fact that the industry will at some point be faced with limitations in expansion due to scarcity of development land. Both sectors are directly related to tourist development ie associated with housing and apartment construction in the tourist and residential zones.

Table 7: Registration of Establishments - 2005

Number of people employed														
	D	E	F	G	H	I	J	K	L	M	N	O	P	SUM
Dromolaxia	67	0	204	143	37	17	21	4	23	18	11	47	38	630
Kiti	118	1	88	115	31	16	24	12	46	94	4	23	56	628
Meneou	29	22	62	31	14	8	4	8	10	23	0	8	20	239
Pervolia	23	0	81	22	87	15	4	16	11	15	0	8	15	297
TOTAL	237	23	435	311	169	56	53	40	90	150	15	86	129	1794
	13%	1%	24%	17%	9%	3%	3%	2%	5%	8%	1%	5%	7%	100%
Number of Establishments														
Dromolaxia	24	0	80	64	26	15	5	3	2	7	5	31	38	300
Kiti	18	1	29	61	18	16	5	7	4	13	6	17	56	251
Meneou	7	1	24	20	10	9	2	2	2	4	0	9	20	110
Pervolia	8	0	22	16	19	11	2	6	2	2	0	10	15	113
TOTAL	57	2	155	161	73	51	14	18	10	26	11	67	129	774
	7%	0%	20%	21%	9%	7%	2%	2%	1%	3%	1%	9%	17%	
% of people employed per community														
Dromolaxia	11%	0%	32%	23%	6%	3%	3%	1%	4%	3%	2%	7%	6%	100%
Kiti	19%	0%	14%	18%	5%	3%	4%	2%	7%	15%	1%	4%	9%	100%
Meneou	12%	9%	26%	13%	6%	3%	2%	3%	4%	10%	0%	3%	8%	100%
Pervolia	8%	0%	27%	7%	29%	5%	1%	5%	4%	5%	0%	3%	5%	100%

Code			
D	Manufacturing	E	Electricity, gas and water
F	Construction	G	Wholesale and Retail trade
H	Hotels and Restaurants	I	Transport and Communications
J	Financial Services	K	Real Estate
L	Public Administration	M	Education
N	Health and Social Work	O	Social and Personal Service Activities
P	Households Employing Domestic Staff		

Source: *Registration of Establishments 2005, Statistical Service*

Although for the 3CPA the economy is tourism dependant, people employed in the sector account for less than 10% of the total workforce, a fact that is attributed to the type and structure of tourist development that is heavily focused on the secondary home market. Wholesale and retail services serving predominantly the local population rank second in importance. A notable variation occurs in the Pervolia area where restaurants and tourism employ nearly 1/3 of the employed people of the area. In fact Pervolia can be regarded as the centre of the Area's tourist activity and the only village with a square that can offer night life entertainment.

4.3 Agriculture & farming in the Pilot Area

4.3.1 The agricultural sector since 1985

Prior to 1985, agriculture was the dominant activity in the Area favoured by a number of key environmental factors that partly stemmed from the coastal climate. A visitor's first impression today is that development and urbanization are constantly eating away the Area's traditional, agricultural sector. Yet, statistical evidence based on a twenty year time span suggests differently, marking a 35% increase in the cultivated land during the period 1985-2003 (see table 4.8). This increase could well have been the result of several factors of which the following stand out as most important:

- The increased availability over this period of irrigation water from the Southern Conveyor Project
- The growing population of the greater Larnaca District that pushed the demand for agricultural products
- The highly subsidized cereals production that supported the sector's growth which outweighs any other agricultural production
- The strong Dairy farming sector of Dromolaxia which is favored by the strong prices for dairy milk (among the highest in Europe) which further created the need for extensive animal crop cultivations.

Table 4.8: Total Cultivated land 1985-2003

	2003	1994	1985
Dromolaxia	12,326	9,409	8,186
Kiti	12,006	9,853	6,520
Meneou	4,280	3,828	5,641
Pervolia	4,258	3,883	3,976
	32,870	26,974	24,324

Source: *Census of Agricultural Statistics 1985, 1994, 2003*

What should be further pointed out is that since 2003 most of the above mentioned factors have to a greater or lesser extent been negatively affected either by natural causes (shortage of quality water supplies) or by the opening up of Cyprus' market to EU imports of agricultural products.

Statistics also verify that throughout the years, Dromolaxia region experiences a different profile to the other three communities (3CPA) within the Pilot Area. A high proportion (over 90%) of its cultivated land is devoted to grain and fodder crops – the so called rainfed crops giving a comparatively low value added. On the other hand, the 3CPA experience persistently a more balanced agricultural profile with a significant proportion of land devoted to vegetables and other irrigated crops (eg summer annual fruit and citrus). This dual profile is maintained throughout the twenty year period till to date, an outcome possibly of a marked variation in the coastal microclimate of the 3CPA vis-à-vis the more 'inland' climate of Dromolaxia. Besides coastal factors, it needs to be pointed out that much agricultural land in Dromolaxia belongs to the Turkish Cypriots, hence their current users are limited in proceeding to substantial investments needed to produce higher value crops.

4.3.2 The current agricultural profile of the Area

Using recent data, obtained from the Cyprus Agricultural Payments Organisation, that relate to the total figures from the 2006 declarations for direct support on agricultural holdings, Table 4.9 below gives an up-to-date profile of agricultural land use in the selected Area.

Table 4.9: Agricultural land use – 2006

	Total area agricultural crops			3CPA		Dromolaxia	
	area dec	% total	% per crop type	dec	share of agric. Land	dec	share of agric. Land
Vegetables	2947	11%		2554	18%	393	3%
Artichokes	887		30.10%				
Leafy and other veg	840		28.50%				
Potatoes	892		30.27%				
Animal Crops	3628	14%		1702	12%	1926	16%
Hay	588		16.21%				
Wheat for hay	678		18.69%				
Siphon	1781		49.09%				
Grains	16893	66%		7758	56%	9135	77%
Wheat	2166		12.82%				
Barley	14721		87.14%				
Fruit	797	3%		674	5%	123	1%
Melons	108		13.55%				
W/ melons	332		41.66%				
Citrus	297		37.26%				
Olive and nut trees	714	3%		540	4%	174	1%
Olives	708		99.16%				
Greenhouses	61	0%		52.5	0%	8.5	0%
Set aside	750	3%		578	4%	172	1%
	25790			13858.5		11931.5	

PS. Table 4.9 figures show a much smaller total agricultural acreage compared to the 2003 Census statistics – table 8. This is attributed to two important parameters that need be mentioned,

(a) the approved for subsidy area is normally 5-10% smaller than the actual (corresponding) cultivated land

(b) part of the agricultural land is either not declared for subsidy or excluded from support for technical reasons.

It would therefore be sensible to presume that the total cultivated land for 2006 is 10-15% more than the figures presented on our table (which relate only to the approved for subsidy area), i.e. around 3.000 ha.

Source: Cyprus Agricultural Payments Organization

The resulting overall profile indicates clearly that Grains and Fodder crops dominate the local agriculture. An estimated 80% of the total agricultural area is devoted to the cultivation of these two, rain fed crop types and 72% of these crops relates to barley cultivation. The picture is typical of the lowland agricultural patterns experienced in Nicosia, Larnaca and Ammochostos regions as depicted in the table opposite, implying therefore that the Area does not differ substantially from the overall land use patterns experienced in those Districts and especially in Larnaca. Open field vegetable crops cover 11% of the agricultural land while organised greenhouse production is practised in a very small scale. A smaller proportion of land is devoted to olive trees, citrus and open field annual summer fruit crops.

District	% of cereal and fodder crops
Nicosia	70%
Ammochostos	60%
Larnaca	83%
Lemesos	30%
Pafos	40%

Source: Census of Agriculture 2003, Statistical Service

However, the underlying figures coupled with an on-site observation suggest that the above profile is not representative of the overall region but instead a dual agricultural profile pattern exists, a point already noted. These profiles should therefore be studied separately and are segmented as follows:

- The 3 Communities Pilot Area (3CPA) closest to the coast, namely Pervolia, Kiti and Meneou
- The adjacent inland region of Dromolaxia

(a) **The 3CPA:** This area shows a balanced land use pattern with nearly 25% of the land devoted to fruit and vegetable crops (compared to 5% in Dromolaxia). Open field cultivation is extensively practised covering an area of approximately 300 ha as opposed to 5 ha of greenhouse crops. The dominant crops cultivated are the winter-spring season potatoes and artichokes, and the summer season okra and chillies. The former two crops are well indicated on table 9 whereas the latter two have been identified during on-site observations and personal interviews with local growers. A unique characteristic of the 3CPA and even more specifically of the Kiti and Pervolia communities, relates to the very high concentration of artichoke production, a reported figure of 89 hectares which represents more than 1/2 of the entire island's area devoted to this crop. Subsequently it could well be stated that the selected 3CPA is the major supplier of artichokes and that any adverse effects will create shortages of this product in the local markets. Artichoke cultivation has been for decades a traditional crop in this region. The majority of the plants of "Kiti" variety artichoke are very early in production and high yielding. The farmers still use it because of its earliness, the high yield and the good quality of characteristics. Besides tradition, artichoke production is favoured by the coastal, no-frost climate and the good soil fertility and it is notable that this cultivation is only limited towards the coastal regions of the two communities. In all the nearby inland communities, where such factors do not exist, no artichoke production takes place.

Potatoes is the second most important irrigated crop but its significance to the overall Cypriot production is minimal and its overall contribution to the agriculture of the area compares negatively vis-a-vis the well known 'red soil potato regions' where potato

cultivation is a dominant activity. However, it is a substantial income yielding activity for the area accounting for 14% of its agricultural GDP.

Substantial volumes of summer cultivated okra and chillies are also grown in the area, destined almost exclusively for the export markets. Production from this particular area commands a higher price as an early maturing crop but loses ground in the late summer months to inland crops. Okra cultivation is closely related to the coastal conditions both favourably and unfavourably. The higher temperatures and RH in the area during the Spring months, especially the higher minimum temperatures and the no-frost conditions favour the early planting and subsequently harvesting of okra much demanded by Vegetable Exporters. On the other hand, the high RH of the area in subsequent months raises product susceptibility to bruising therefore turning local production inferior to inland crops.

Pervolia and Meneou have a very small farming sector as depicted in Annex 1.4, mainly due to a shortage of available land for farming and grazing activities. Contrary to this, Kiti has a stronger farming sector due to the availability of land in designated agricultural zones.

Dromolaxia: The Community has remained a highly agricultural area with a much higher concentration on rain fed crops such as cereals (mainly barley) and animal crops. This concentration reaches a percentage figure of 93% leaving only fractions of cultivated land to other more productive and value added crops. The presence of substantial land devoted to animal crops is explained by two key factors:

- (a) the significant number (10 farms/ 919 dairy cows) of intensive dairy farming and the large number (67) of sheep and goat farms
- (b) the availability of an extensive irrigation network that uses third level treated sewage water from the nearby, Larnaca Sewage Plant, with 1.5mln tons (80%+ of its output).

Although situated near the coast and experiencing similar climatic and other environmental conditions, Dromolaxia shows a marked variation compared to the 3CPA in the cultivation of fruit and vegetables. Environmental factors do not show a marked variation that can justify the absence of irrigated tree and vegetable crops. Instead, the reasons behind this variation are linked to (a) the fact that most agricultural land in Dromolaxia belongs to Turkish Cypriots, therefore serious capital investments may not take place and (b) the absence of irrigation water via the Southern Conveyor Pipeline as the area is not connected to the network of pipelines.

4.3.3 Agricultural profile comparisons with nearby inland areas

Even though Dromolaxia has a similar agricultural profile to more inland communities, it could be stated that environmental factors could be contributing more than other factors in shaping this profile compared to the 3CPA crop patterns. The tables below confirm the different agricultural profiles between (a) the 3CPA, (b) the inland areas starting from the Northern side of Dromolaxia Community and moving along an axis that extends for 20-25 kms inwards. As benchmark points we have selected the Communities of Klavdia, Kalo Chorio, Psevdas and Kornos. Both tables denote a clear variation in the agricultural profiles between the 3CPA and the selected inland regions. The 3CPA derives most of its income from the irrigated crops (vegetables and citrus) whose production is favoured by coastal resource factors whereas inland regions are more dependent on rainfed crops with a much smaller value added. In general, inland areas seem to face poor soil fertility

and lack of water supplies meaning that crop patterns of the type met in the 3CPA are not feasible. Furthermore, coastal climatic conditions, especially the lower diurnal temperature spread, the milder Winter and Spring and the higher summer RH can be termed as differential factors influencing the two agricultural profiles.

Observations also suggest that inland areas have a stronger farming sector as this is not dependant on environmental factors but requires an abundance of farmland which is available in the selected inland area. Farming creates the need for larger volumes of rainfed crops, ultimately resulting in a lower agricultural GDP per ha, counterbalanced however by the high GDP of the farming sector. Yet, the lack of 'green crops' including irrigated tree yards or vegetable crops can be seen as a drawback in relation to the side effects of agriculture ie attractiveness of the environmental scenery. Furthermore, unlike agriculture, farming is incompatible with other forms of development therefore affecting negatively land prices for housing and other forms of development.

Table 4.10: Agricultural land use in selected communities

	Total area (decares)	Major agricultural uses					
		Cereal for Grain Production	Fodder Crops	% of cereals and animal crops	Fruit & Veg	Citrus	Olive trees
Dromolaxia	12,327	60%	30%	90%	5%	0%	3%
Meneou	4,280	68%	6%	75%	2%	16%	6%
Kiti	12,006	59%	13%	73%	14%	0%	3%
Pervolia	4,257	67%	3%	70%	22%	0%	5%
Klavdia	8,469	80%	17%	98%	0%	0%	2%
Kalo Chorio	13,206	80%	18%	98%	0%	0%	2%
Psevdas	2,554	50%	34%	84%	1%	0%	12%
Kornos	4,263	39%	14%	54%	2%	1%	32%

Source: Census of Agriculture 2003, Department of Statistics

Table 4.11: Farming activities in selected communities

	BOVINE ANIMALS		SHEEP & GOAT		PIGS HOLDINGS	
	No of Holdings	No of Animals	No of Holdings	No of Animals	No of Holdings	No of Animals
Dromolaxia	8	1,868	76	8,268	5	17,812
Meneou	-	-	13	1,858	-	-
Kiti	5	1,530	44	3,453	6	22
Pervolia	-	-	16	1,528	-	-
Klavdia	5	234	43	4,201	11	243
Kalo Chorio	7	494	78	8,553	4	12
Psevdas	2	130	24	1,753	6	27
Kornos	-	-	26	2,067	15	413

Source: Census of Agriculture 2002

4.3.4 The key value crops

Annex 3 is an extended approach to the Area's agricultural profile (Table 4.9) and has been compiled using data from the 2007 Norm Input-Output Data published by the Agricultural Research Institute. The total GDP from agriculture has been calculated at

€4.9 to €7.0mIn, accounting for 6-7% of the area's GDP. Farming (dairy cows and sheep/goat) contributes another €6.0 to €7.0mIn raising the total GDP from all primary sector activities to around €11 - €14mIn. Furthermore, Annex 1.3 gives a few other interesting issues worth investigating further.

- Vegetable crops dominated by artichokes and potatoes contribute greatly to the agricultural GDP (48%) despite the small coverage of agricultural land (11%). The case is similar with greenhouse vegetable crops (mainly tomatoes and cucumbers) which account for less than 1% of the agricultural area but contribute nearly 9% to the Area agricultural GDP. These value crops are not cultivated in inland areas thereby reducing the total value of agricultural production in the economies of these communities.
- Although Dromolaxia is the major agricultural centre accounting for 46% of the total agricultural area its contribution to the Area's agricultural GDP is only 22% a fact attributed to the high proportion of land cultivated for low value cereals and fodder crops. Yet, the value added on these crops is reflected with the addition of farming GDP and the higher concentration of dairy farms raises Dromolaxia's contribution to the Area overall primary sector GDP to 47%.
- Although it is well known that the climatic conditions favour citrus production, the area has not been traditionally involved in this type of cultivation with the notable exception of the Meneou yard which however has recently been turned into residential land and is gradually sold as residential plots. Without going into deeper analysis it is evident that citrus production is in recent years losing out to foreign competition and that on pure economic grounds, the owners chose to sell their land for residential purposes, a sensible action at individual level that has however, adversely affected the Community's rural scenery.
- Grain and Fodder crops which offer the lowest value per ha dominate the region's agricultural land despite the lack of any significant comparative advantage arising out of its coastal location. A notable exception takes place in the Dromolaxia Region where Fodder Crops capitalise on the abundant treated water supplies from the nearby Sewage Plant.
- It should be pointed out that with the notable exception of fodder crops that are cultivated for use in the local farms, much of the agricultural output is destined for the local markets of Larnaca and Nicosia. A strong summer export crop is cultivated in the 3CPA of okra and chillies, both products greatly favoured by the coastal climatic conditions but facing production constraints from short supplies of irrigation water.

4.3.5 Employment in agriculture

Using employment statistics from the 2003 Agricultural Census and cross-checking the resulting figures with on-site observations and interviews we have concluded that 1 out of 5 working people are employed in agriculture.

This should re-affirm the conclusion that the agricultural income is vital for the economy of the Area, despite a continuing tendency for urbanisation. The age structure of the growers / farmers (as owners of the holdings) is adequately balanced and in line with island wide and District figures which however denote a general tendency for a 'getting older' agricultural population. We have not estimated the contribution of agriculture to the area's employment figures as a significantly large number of immigrant workers have been included in the statistical figures that could give misleading conclusions.

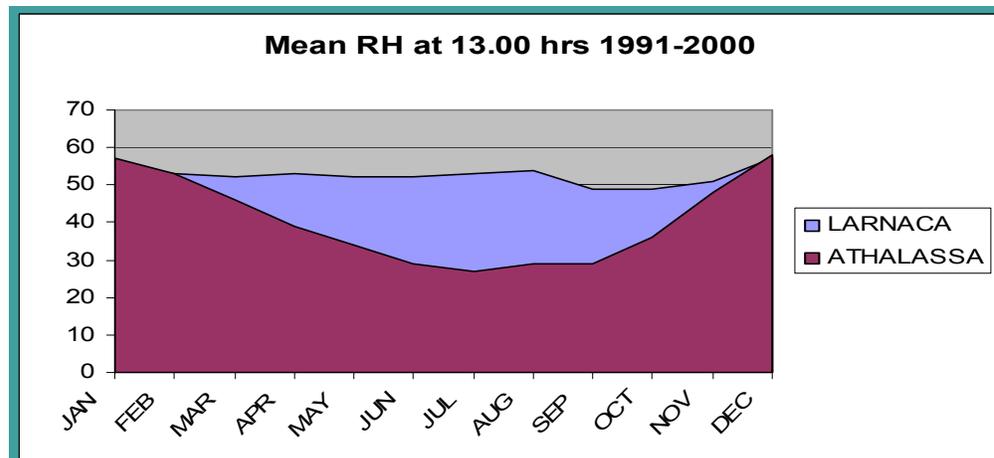
Table 4.12: Employment in agriculture - 2003

	No. of owners and members of household	No of labour permanent & temporary	Age of owner / % of total holdings		
			Up to 44	45 - 64	65+
Cyprus	80,122	123,456	24%	53%	23%
Nicosia	28,148	24,142	21%	55%	23%
Larnaca	12,382	10,703	26%	53%	21%
Dromolaxia	354	178	30%	45%	25%
Meneou	76	140	29%	38%	32%
Kiti	377	310	24%	51%	25%
Pervolia	156	178	25%	57%	18%
TOTAL FOR AREA	963	806			

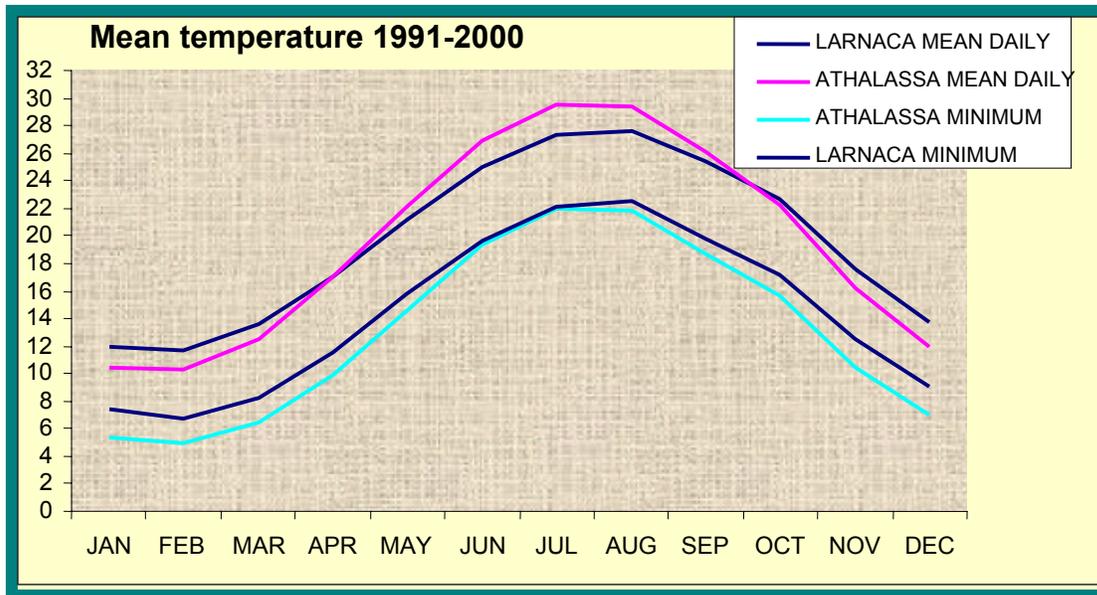
Source: Census of Agriculture 2003, Department of Statistics

4.3.6 Environmental factors favouring agricultural production

Mild climate: Due to its coastal location, the area experiences a more even distribution of temperature diurnally and seasonally compared to inland regions, therefore favouring the production of a range of crops throughout the year. Winter frost is minimal and summer extreme hot conditions are rare, as depicted by the climatological graphs below. These factors favour an early maturity to the production of selected summer crops and a relative advantage in frost sensitive crops.



Source: Meteorological Service, Ministry of Agriculture, Natural Resources and the Environment



Source: Meteorological Service, Ministry of Agriculture, Natural Resources and the Environment

Flat land: Identified visually and confirmed using a contouring map, this particular coastal Area is characterised by a flat plain reaching inwards as far back as 8kms therefore providing farmers with a cost efficient cultivation land to work with and a wide open area to utilise machinery and practise large scale cultivation techniques.

Water supplies: This is a key resource input that is missing from the area and a factor that adversely affects the viability of the area in maintaining an agricultural comparative advantage. Underground boreholes, especially in the Pervolia and Meneou District pump water with high salinity levels. The Kiti District reports a handful of rich in quality water irrigation boreholes which are owned by 2-3 vegetable growers and 2 such boreholes are used by the Community Council to provide for irrigation supplies in Community land uses. Agricultural water supplies are met via the Sothern Conveyor irrigation scheme which currently faces substantial shortages and constraints the cultivation of irrigated crops. A major and possibly important for the future source of water supply is in the last few years, water from the nearby Larnaca Sewage treatment plant. This is a major environmental addition to the area which to a great extent provides a partial solution to the limiting water resources of the region. Planning for an efficient use of this water supply and creating added value for the area may be vital for its future sustainable growth.

Larnaca Sewage Plant - facts

The Sewage Plant currently produces 1.8 million tons of third level treated water which is given to the Local Water Board. Through a network of pipe lines this water is sold at a price of 4-6c and used for agricultural and garden irrigation purposes. Around 80% of the annual production is sold to farmers in the Dromolaxia Community used for irrigating animal crops. The balance 20% is used by hotel owners on the eastern coast of Larnaca for the garden irrigation needs. As noted by the Plant's Director, demand by growers and farmers of Dromolaxia and nearby communities are high, pointing towards the suitability of this water for animal and tree crops. The plant additionally produces 5,000 tons of compost which is currently used as fertiliser in animal crop cultivations.

A new capacity expansion is due to start soon which also includes the connection of the Pilot Area (estimated to provide the plant with 5.000 cu.m. per day) to the Sewage Plant. Future capacity is set at 24,000 cu.m./ day (8 million tons annually) and a long term target (2020) raises the annual production to 15 million tons. A further plan includes the desalination of the treated water which essentially means that it can be used in a multitude of activities, hence policy making on this issue is essential in achieving an optimum economic and social welfare balance.

Fertile land: Our field work and interviews suggested that land fertility is to some extent inversely related to the distance from the coast as we move inland along a 25km radius. Areas between Dromolaxia and Kornos are characterised by a low land fertility an observation which is to a great extent supported by the absence of any significant vegetable cultivation or commercially managed tree crops. Historically, the agricultural scenery in the inland areas stretching from Kalo Chorio, Klavdia, Alethriko and Kofinou was dominated by the large number of carob and olive trees well suited to dry, harsh climates and infertile soils. Land fertility could be related to the geomorphology of the region as it evolved throughout the centuries and appears to have played a key role in shaping up agricultural patterns between coastal and adjacent inland areas.

4.4 The tourism sector

4.4.1 Types of tourist development

Unlike other similar coastal regions of Cyprus, the Pilot Area has over the past twenty years developed a tourist industry that is primarily focused on the construction and sale of secondary (vacation) housing, a development structure favoured by the abundance of privately owned, flat coastal land in a designated tourist zone. In a coastal front of nearly 8.5kms that extends from Meneou to Pervolia covering a total tourist zone of 5 sq km there are only 2 hotels with a total (daily) capacity of 350 beds and three approved tourist apartments with a capacity of another 58 beds. Using a hypothetical (imputed) rent approach, Annex 5 illustrates that the secondary home market generates three times more GDP than the hotel/ apartment sector.

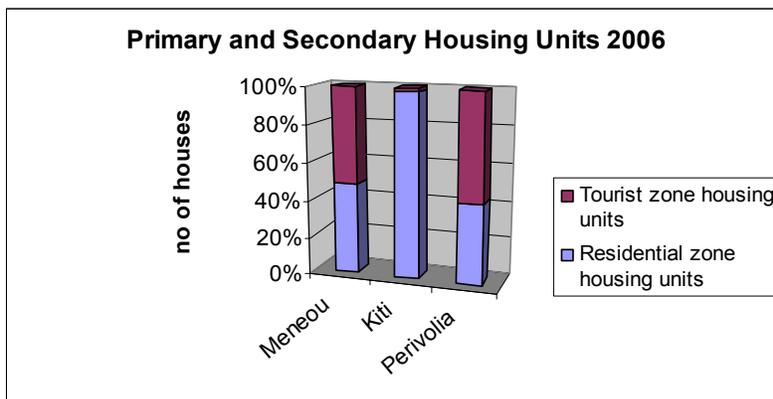
The table below shows the growth trend of vacation housing in the 3CPA during the period 1982-2006. The growing importance of this sector is depicted by the percentage figure of secondary to total housing units that has risen from a mere 6% in 1982 to 40%+ by 2006. In terms of absolute figures the number of housing units has grown from 62 to 2.047 during the period of 24 years. This growth could be translated into an estimated figure of 150-200 ha been used up in the process for tourist development.

	1982		1992		2002		2006*	
	Total	Secondary/ seasonal	Total	Secondary/ seasonal	Total	Secondary/ seasonal	Total	Secondary/ seasonal
Meneou	182	13	410	161	696	348	890	460
Kiti	583	37	848	95	1,113	166	1695	30
Perivolia	315	12	983	571	1,819	1,055	2726	1557
Total for 3CPA	1,080	62	2,241	827	3,628	1,569	5311	2047
Secondary/ total		5.74%		36.90%		43.25%		38.54%

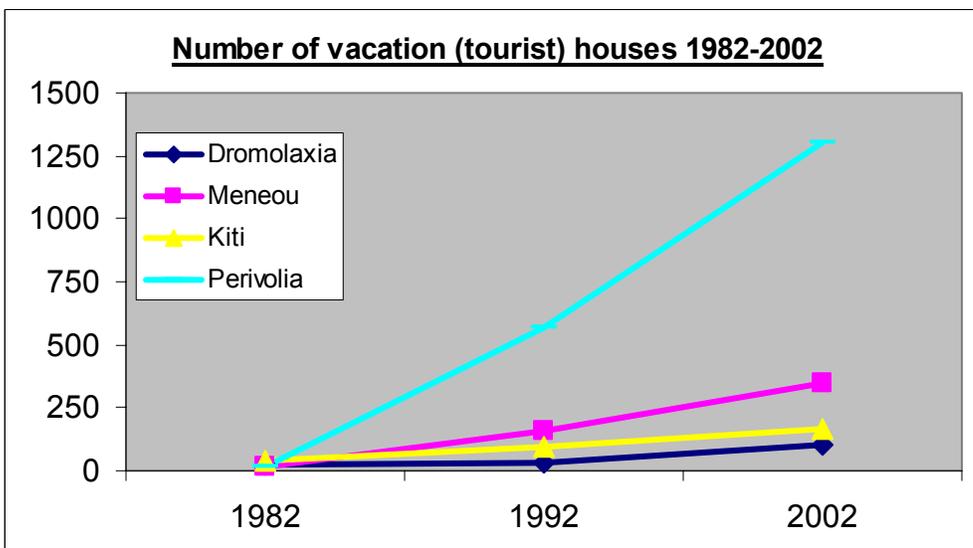
Source: Population Census 1982, 1992, 2002

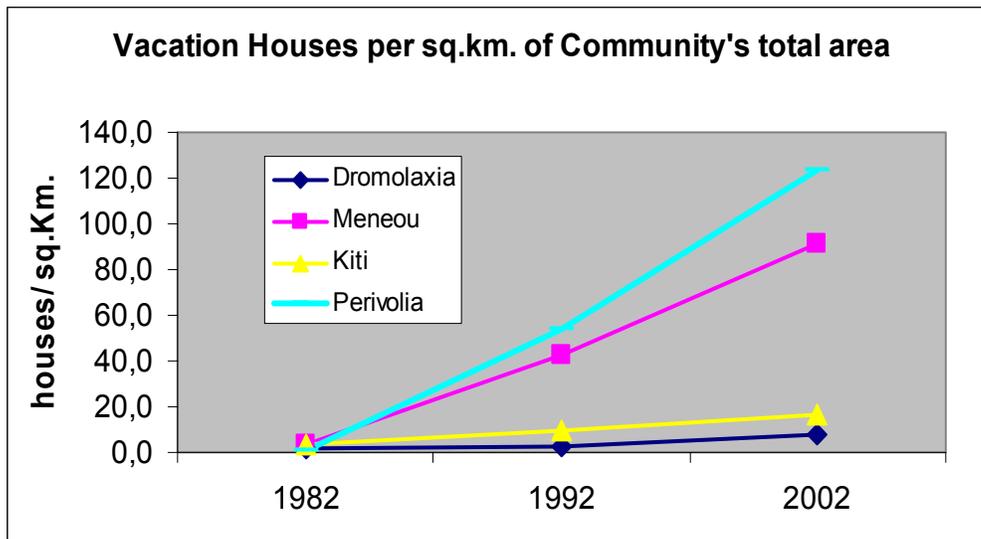
* Figures are based on community council data and are segmented by residential and tourist zone

The graph below illustrates a comparison between housing units in the residential and tourist zones for 2006. Given the fact that nearly all housing units in the tourist zone are vacation houses we may conclude that 50-60% of all housing units at Meneou and Perivolia belong to non-permanent – vacation owners.



The two coastal Communities benefit the most from the tourism economic activity, a fact that is easily depicted when comparing the growth of vacation houses in each of the four communities during the period 1982-2002.





Kiti presents a different outlook, with a very small and undeveloped tourist zone (which however becomes much larger if joined with Softades) and therefore a figure of only 30 (2%) tourist houses are recorded. Observations further suggest that vacation housing is nearly non-existent in the Kiti residential zone. However, the Softades coastal area, currently governed by the Community Council of Kiti, is a designated tourist zone with the highest development potential. The zone covers an estimated area of 4 sq.km and a beachfront of 3.5 kms and the land is currently used for agricultural purposes (cultivated with barley for baling purposes).

On the eastward coast extending from Faros to the Airport, the total coastline is estimated at 6 kms of which 3 kms remain as clear, un-developed beach.

A great part of the tourist zones in Pervolia and Meneou is therefore already been transformed by real estate developers into secondary home complexes. On site observations further lead to three broad conclusions:

- (a) That development has already reached a limiting point at Meneou tourist zone and the only undeveloped beach front falls outside the Meneou boundaries, towards the Larnaca airport
- (b) That development potential exists at Pervolia tourist zone but high land values act as a barrier to development as they push housing prices too high thus squeezing the available market. Furthermore, new development projects in the area may lead to the problem of an overcrowded tourist zone, depriving the region from possible current competitive advantages that stem from a peaceful environment.
- (c) That a new untapped area is due for development in the Kiti-Softades coastal region and Kiti Community Council is currently giving a push to development by funding the construction of a wide road that links Kiti with Softades and Pervolia tourist zones.
- (d) Dromolaxia, the non-coastal community has not developed any tourism industry. This leads to an important conclusion, that despite the small distance of Dromolaxia from the coastal communities, there is a significant loss of economic development from the non-coastal environment which supports the growth of a tourist industry.

4.4.2 Tourism GDP estimates

From points already raised, it becomes apparent that the Area's income from tourism arises mainly from an unrealised (imputed) rent that is calculated by assigning a rental value to the secondary housing units found almost exclusively in the two coastal Communities, Pervolia and Meneou. Table 1.5 (Annex I) broadly records the available tourist accommodation units in the Area and denotes the significantly small share of hotel accommodation. The value of the imputed rent represents an averaging from a set of rental values quoted in the market during the period June-August and refers to 3 bedroom houses of an estimated 150-200 sq.m covered area. Additional GDP values have been entered to cover the remaining economic activities related to tourism calculated using a set of data derived from various statistical reports. It should be pointed out that from statistics of the Cyprus Tourism Organisation average occupancy rates for the Larnaca District in 2006 were 58% for 2* hotels, 66% for B* hotel apartments and 6% for tourist apartments.

The secondary house market type of tourism development has a number of implications on the area's economy being on the one hand a less intensified form of tourist activity but on the other hand it contributes to a lesser extend in the Area's income growth. It goes beyond the scope and budget of the current report to estimate the amount of money spent by tourists (including second home owners) in the Area and compare this figure to the island's average so as to judge the possible 'spending gap' between conventional tourist development vis-à-vis vacation housing tourism.

4.4.3 Attractions and recreation facilities



Medieval Rigaina's Tower, Pervolia: dated from the Venetian period (1489 – 1571) and declared as a protected cultural site.



Kiti dam was built in 1964, capturing water from Tremythos River. It has a capacity of 1.6 million cu.m. and attracts wild life during the winter and spring season when it carries an adequate water reservoir.



Catering facilities these are concentrated mainly around the Pervolia village square which is the focal point of attraction for the area's night life.



The "Aggeloktisti" church is of the transept order with a dome and was built around the 11th century. The apse of the church, which is considered to be older, is a remain from a 5th century Basilica while the west part is a more recent expansion.

4.5 Construction and Real Estate

Current data from the 2005 Registration of Establishments (see table 4.7) puts construction and real estate as the leading employer in the Area with 26% of the total labour force or 475 people employed of whom 435 are in construction alone. Figures and observations also place the sector as the most economically active business capitalising on two major development factors,

- (a) The continuing demand for secondary homes with a prime comparative advantage that stems from the coastal environmental resources and the high demand for resort homes closest to the beach
- (b) The attractiveness of the Area for new families that raise demand for residential land and housing property

GDP for the sector has been calculated using an estimated average annual salary for the number of people employed using salary figures from the Statistical Abstract of 2005. For the construction sector the average monthly salary has been calculated at £950/ month (technicians, craft workers and building labour). For the real estate sector the estimated salary is £667/ month and is based on duties of receptionist and information clerks.

	Construction		Real Estate	
	No of people	Wages	No of people	Wages
Dromolaxia	204	£2,519,400	4	£34,684
Kiti	88	£1,086,800	12	£104,052
Meneou	62	£765,700	8	£69,368
Pervolia	81	£1,000,350	16	£138,736
TOTAL	435	£5,372,250	40	£346,840

Source: Registration of Employment 2005, Statistical Abstract 2005

Our observations indicate that other than land, no more local resources are employed in the industry.

Both in economic and environmental terms this sector of activity has by its nature limits in its growth potential guided by the following factors:

- (a) Land available for real estate trading and construction becomes all the more scarce as development advances

- (b) High real estate development (especially in a non-balanced manner) invariably leads to overcrowding, a situation that impairs a serious competitive advantage that is often sought by vacation home buyers. By the term non-balanced manner we refer to real estate development that is one sided, profit driven construction and sale of property not matched by proportionate betterment of environmental resources.
- (c) Scarce resources lead to an excessive push in land prices which by economic definition results in less demand.

All three factors point further on the issue that the construction and real estate sector is not, by its nature, a sustainable sector both in economic and in environmental terms. It does lead to supernormal profits in the short term and creates an abundance of jobs for the community but on a longer term basis the sector cannot on its own generate a sustained wealth for the Area. Policy making should therefore identify ways of stepping in the real estate sector for the purpose of redistributing wealth so as to provide, through the construction sector, supporting instruments to other more sustainable economic and/or social activities. Studying policy measures in the Pilot Area, we have not identified any instruments that aim at redistributing in the manner stated above, the wealth generated through real estate in favour of the Communities' total wealth.

4.6 Industry (including small workshops)

The Area has a small number of manufacturing industries, a fact that is tied to the traditional agricultural dependence of the local communities but it is also related to the absence of specific policy measures at attracting manufacturing activities in the area. Furthermore, significant shortages of industrial zone areas and infrastructure have been reported. In the 3CPA there is only one small industrial zone of 26,000 sq.m. at Kiti, capable of satisfying 55 workshops and small processing firms. This industrial area is leased for a period of 33 years and for funding the construction of its infrastructure (not buildings) the Central Government provides 2/3 of the cost. There is pressing demand from Community Councils for the establishment of new industrial zones but the lack of available communal land does not help in setting up more organised industrial zones.

	Manufacturing	
	No of people	Wages
Dromolaxia	67	£709.865
Kiti	118	£1.250.210
Meneou	29	£307.255
Pervolia	23	£243.685
TOTAL	237	£2.511.015

Our on-site observations lead to the conclusion that the residential zone in the 3CPA is developing in an unplanned manner with a mixture of residential, industrial (small workshops) and semi-tourist apartment construction. The need for a segmentation of the industrial activity in organised zones is essential and should be pursued in any future integrated planning of the Pilot Area with a twofold approach:

- (a) provide industrial infrastructure to existing companies and segment industries from residential and tourist zones
- (b) attract new businesses in the area in order to achieve a more balanced economic growth for the region.

4.7 Wholesale and Retail trade

The table below indicates that the size of establishments in this sector is very small, averaging at less than 2 people per establishment. It appears that most establishments

Wholesale and retail trade			
	No of people	No of est/ments	Employees/ est/ment
Dromolaxia	143	64	2,23
Kiti	115	61	1,89
Meneou	31	20	1,55
Pervolia	22	16	1,38
TOTAL	311	161	1,93

are one-man grocery, newsagent shops. Using figures from the Statistical Abstract 2005 that quote a Gross Output per employee of the sector is £21-24.000, giving an estimated GDP for the sector of €11-13 million.

4.8 Public administration, Education and Health

The contribution of these sectors to the GDP is depicted in the table below and is based on the average normal monthly rates of pay for the period 2005 (data taken from the Statistical Abstract 2005).

In terms of public spending, the 2006 budgets for the 3CPA Community Councils are roughly £1.6mln of which 20-25% relates to salaries and wages expenses.

Public Administration			Education			Health services		
People	Monthly salary	Value	People	Monthly salary	Value	People	Monthly salary	Value
90	€ 2.630	€ 3.077.100	150	€ 2.200	€ 4.290.000	11	€ 1.896	€ 271.128

4.9 Other economic activities

We have calculated GDP estimates for other sectors of economic activity using average monthly pay statistics obtained from the Statistical Abstract report of 2005. We have also included in the GDP estimation the output value of two major Plants that are situated in the area, the Desalination and the Sewage Treatment Plants. GDP from these operations was estimated using their annual output multiplied by the estimated selling price of their end products.

Financial Services			Social work			Households staff		
People	Monthly salary	Value	People	Monthly salary	Value	People	Monthly salary	Value
53	€ 2.069	€ 1.425.517	86	€ 1.236	€ 1.382.079	129	€ 397	€ 984.399

Estimated GDP values from major industrial Plants situated within the Pilot Area boundaries

Desalination plant	15mln cu.m. @ €0.78	17mln cu.m. @ €0.78
Sewage treatment plant	1.8mln cu.m. @ 0.069	1.8mln cu.m. @ 0.103

Economic Profile Supporting Information in Annex I

5.0 WHY AN ENVIRONMENTAL ECONOMICS STUDY – ITS PURPOSE AND BASIC PRINCIPLES

5.1 Key issues – Gains, benefits and stakeholders

In Cyprus, at present, the protection of coastal areas against over-development, and eventual degradation, relies on two main mechanisms operating on two levels:

- *Regulation* exercised as part of the instituted land use and environmental policy level, and
- *Environmental awareness* at the individual and local community level.

Both mechanisms, although they acknowledge that the coastal environment is part of nature that (ethically) has to be conserved, in practice, accept its use for building development for achieving income and employment growth. Evidently, both coastal protection mechanisms prove insufficient to provide sustainable protection due to three main reasons, two specific reasons and one more general reason:

Regulation operates through the formulation and application of administrative standards that set limits to development; it tends to be negative by definition and is perceived as 'anti-development' often resisted by the private sector which is particularly dynamic and well organized in Cyprus. Evidently, the effectiveness of regulation depends on its enforcement which is often crippled by administrative complexity, inter-departmental responsibility overlaps, issues which render regulation less than adequate to harness development pressures.

Environmental awareness, potentially a more powerful protection mechanism, is in practice a long term process and takes a long time to become effective in influencing policy and actions.

A more general factor of particular importance is the inability of either regulation or awareness to define and justify *options of higher or lower level of coastal protection* (more or less development) with reference to *net gains* from degrees of protection and development. The stress on *gains* is crucial here given that both protection measures and development policy decisions are taken to achieve *some* expected gains. Therefore, information about *relative gains* is crucial in the application of environmental protection measures. To bring into policy focus the question of gains from various degrees of protection, information is needed on three issues:

- The benefits of coastal resource conservation;
- The timeframe of benefits (short term and longer term); and
- The distribution of benefits.

Benefits To decide on the *net* benefits of development / conservation options, the type, extent and value of the benefits of both development and conservation must be considered when, for example, a certain part of the coast is given to development. The crucial point here is this: While information about the gains from development are obvious and easily measured in terms of income and employment, information about the possible gains (benefits) from conserving / protecting that part of the coast is missing.

This information gap often leads to gaps in the policy framework within which environmental regulation decisions (zoning, quality standards, etc) are taken and enforced.

Long term While development opportunities are perceived and acted upon usually within a short term horizon, environmental quality losses / damages often manifest themselves over the long term which, apart from undermining ecological integrity itself, undermine the long term *productivity* of coastal economic activities (like tourism) that depend on the quality of environmental resources. A long term perspective of the benefits of conservation is often missing creating a bias towards development.

Stakeholders / society Development decisions always involve beneficiaries who gain from development. Usually, the beneficiaries of development are the investors who appraise their gains in financial terms without regard to wider social and environmental losses. Conservation addresses the needs and preferences of a much wider population group much beyond those undertaking development investments. *The public at large*, society as a whole, has to come into the picture to take into account enjoyment benefits and recreation opportunities relative to direct development benefits.

In summary, the economic dimension of coastal protection / management, and specifically the economic value of environmental resources, is not an integral part of the formulation and implementation of spatial plans and policy provisions for coastal protection. **The contribution of environmental economics is to ‘value’ environmental resources necessary for reaching sustainable development by establishing the following parameters:**

- Valuing resources (beach areas, beach quality, access to the beach, coastal views, etc.) helps to identify damages or improvements caused by alternative coastal resource uses,
- Estimating environmental value in economic terms creates market incentives for protecting that value against over-use of coastal resources.
- Valuation also increases national and local level environmental awareness strengthening the commitment towards the implementation of *ICAM* initiatives.
- Valuation reaches the attention and vision of Economic and Finance Ministries to increase protection investment and undertake more effective measures and policy reforms.

Box 1 *The ‘problem’ of ‘putting a value on the priceless’*

A usual misunderstanding of the interest of environmental economists in ‘valuing’ environmental resources and their quality is expressed through a reaction like ‘we cannot put a price on the environment’ because the environment is priceless, it is part of nature and beyond cold economic calculations’. This position is in this sense right. But this is not what environmental economists are attempting to do. What they do is to value **people’s preferences** (demand) for environmental quality in similar terms to the way people’s preferences (demand) for any other good or service, often expressed in housing choices, market expenditures, actions in avoiding personal or property damages or preferences backed by how they spend money.

6.0 THE VALUE OF ENVIRONMENTAL RESOURCES IN THE CASE STUDY AREA

6.1 Valuation methodology and Approach

6.1.1 An overview

The valuation approach applied to this Case Study is *partial*, in the sense that it attempts to capture the most important benefits of the coastal environment and those benefits for which numerical data have been obtained and considered important to analyze. This is common in most such studies.

The benefits of the coastal environment are classified in three main categories:

- **Economic benefits**, those reflected in production / consumption in a market context,
- **Social benefits**, those reflected in preferences for the enjoyment and recreation services offered by the coastal environment, and
- **Environmental benefits**, those which refer to the general quality of the environment on which, usually, a qualitative assessment is attempted.

The broad valuation framework applied to this Case Study is outlined below:

Table 6.1 Types of benefits

Type of Benefits	Sector accruing benefits
Economic benefits	Benefits reflected in market values
Coastal development	-Beachfront holiday housing development -Back row beach holiday housing development -Salt Lakes front housing development
Coastal agriculture	Production of 'coastal' agricultural products
Coastal open rural landscape	Rural heritage and open landscape view benefits to housing
Social Benefits	Social preferences for coastal environment
Coastal open beach use	Willingness to pay for preservation
Local community development	Contribution of coastal development to the local community
Environmental benefits	Quality benefits
Salt Lakes ecological benefits	Heritage value of landscape quality

Two important valuation techniques have been applied:

- **For the valuation of the economic benefits** use is made of the *differences* in the productivity of the housing and agricultural sectors attributed to the coastal environment. This is a particular application of the more widely used economic appraisal technique of considering '*with*' and '*without*' situations.
- **For the social valuation of benefits** the technique of *Willingness to Pay* has been applied to deduce the 'demand' of the public for environmental services either for enjoyment or for the existence / preservation of specific parts of the coastal environment. Local community benefits are also taken into account in this Study to assess the extent to which coastal development benefits reach the local communities.

6.1.2 Valuation Framework and Results

The value of any environmental resource is assessed by the benefits it generates. The benefits are often diverse accruing to multiple beneficiaries and stakeholders. The approach adopted in this Case Study to assess the benefits of the coastal environment begins with a broad identification of the resources in question and their location. From the point of view of this Case Study, the area comprises five main sub-areas (See **Map 2**):

- The beachfront
- The back of the beachfront area but still near and visually linked to the beachfront
- The agricultural area extending north of the main road towards the villages offering rural landscape view features
- The Salt Lakes, and
- The public open beach area.

The beachfront is the main environmental resource which shapes the structure of the local economy and its main *differences* with other neighbouring inland communities. Other areas are also taken into account to obtain a better understanding of benefits. The 'model' is outlined below:

Table 6.2 Locations and type of local environmental assets

Locations generating benefits	Type of benefits	Sector
Beachfront	-Production benefits -Recreation benefits	Holiday housing (high value)
Back-row beach area	-Production benefits	Holiday housing (lower value)
Agricultural land between back row beach area and the villages	-Production benefits -Existence benefits	-Agriculture -Housing -Social / heritage
The Salt Lakes	-Production benefits -Enjoyment benefits -Existence benefits	-Housing -Society -Environment
Natural public open beach land area	-Recreation benefits	-Society

6.1.3 Identification of benefits and their extent (all values in Pounds, 1 Pound = 1.71 Euro)

(i) The beachfront

This is the most intensely developed area. This is explained by the demand for holiday house fronting on the beach set back from the 'foreshore protection line'. Demand for coastal holiday housing is *'derived demand'* reflecting (deriving) from the demand for beachfront location giving open beach views and immediate beach access. The *difference* considered is the market price(s) of housing between the beachfront zone and the other locations (such as back-row beach area and nearest village housing area, at a distance of about 1 km.). This difference can be inferred to be the value of the benefit of

the beach environment. This difference is found to be **40-52%** for villas and 12% for apartments on a square meter basis.²

(ii) Back-row beach area

This area is almost equally intensely developed, predominantly with apartments rather than villas. Back row housing development comprises relatively lower priced apartments and houses demonstrating the reduced beach benefit component in the price. No clear price differential has been obtained between front row and back row accommodation prices, although from interviews in the area it is inferred that the difference in the average price of the back row holiday houses relative to similar size houses further inland drops to around **30%**.

(iii) View to agricultural landscape

Back row houses without direct view to the beach with orientation towards the villages are reported to maintain the 30% price premium relative to village houses for permanent residence, measures on a square meter basis. This 30%, according to local interviews, can be attributed only partly to proximity to the beach *and partly to the open view of the agricultural area (landscape)* which is reported to add to the demand value of housing in this area. Informed local opinion tends to put this value to about 10%. In connection with agricultural land, it should be stressed that, in addition to the agricultural production, part of which is attributed to the coastal microclimate, there is a *landscape view value* working indirectly through the holiday housing market in the following sense. If this area, instead of offering good rural landscape views, was a dry dusty unsightly plane, the value of the houses would certainly be lower. This tends to be borne out by the reported lower prices of similar apartments close to uncultivated open sites in the Zygi / Mazotos area (up to between 7-8%).

(iv) The Salt Lake

The main body of the Salt Lakes washes the southern neighbourhoods of Larnaca town. To gauge the housing market benefit of the proximity to the Salt Lakes figures were obtained from the Housing Census of 2002 showing that some 1,705 houses are located in the zone fronting the Lakes. Information on house pieces obtained from interviews and research put the prices of the front row houses at 2,400 Pounds per sq.m., lower than the Pervolia beachfront (3,000 Pounds) but higher than in the back of the beach areas (1,800 and 1,450), say at 80% of the price ruling in the beachfront area of Pervolia. The back row Salt Lakes house prices drop to 70%, that is 2,100 Pounds.

² The Study of the coast of Israel (CAMP Israel, 2000) has shown premium property values ranging between 25 and 100, although the most frequent value centred around 40% (See Review Paper Protecting Coastal Zones in the Mediterranean, Markandya et.al, PAP-RAC, 2006).

Map 2



6.1.4 Market price indicators used in valuation

Table 6.3 House price hierarchy (prices per square meter in Pounds)³

Beachfront	3,000	100%
Salt Lakes front row	2,400	80%
Beach / Salt lakes back row	2,100	70%
Village housing	1,450	48%

³ House price data have been obtained from interviews with several real estate companies and local stakeholders drawing information from their record of sales as well as their broad experience of the property market. Information was also obtained from the Lands and Surveys Department which confirmed the said data obtained from interviews.

(vi) Non-market – ‘public goods’ benefit valuation

The Case Study Area includes environmental resources which may be called ‘*public goods*’ whose value is not recorded in market transactions but generate benefits for the wider public living, visiting or enjoying their view, an experience which nevertheless people value. The valuation approach in this case cannot rely on market prices but can be captured by interviews allowing people to express preferences for them, an indirect method of assessing public demand for environmental assets / qualities.

For the purposes of this Case Study, and to demonstrate how it can be done, the kind of results obtained and the significance of the information, a questionnaire Survey (**WTP**) was carried out focusing on the valuation of:

- The Salt Lakes
- The Agricultural Landscape
- The open public beach front
- The archaeological site

The survey due to time and resource limitations was small, a random sample of 113 people, 29 permanent community residents, 28 owners of vacation houses, 28 foreign tourists and 28 Cypriot visitors, carried out during August and part of September 2007.

The whole WTP Survey Report is included in Annex II.

6.1.5 Key findings

The survey results provide evidence to support analysis of people’s preferences for the main environmental resources characterizing this area. The survey reveals that people visit the area, either as short-time visitors or summer house owners, because of the areas environmental profile, mainly beach quality and access, and climate.

Table 6.4 Average Willingness to Pay in Pounds as revealed by the Survey

Environmental Asset / Area	WTP Value in Cy P	
	Highest value	Lowest value
Salt Lakes	17.87 by the residents	5.89 by the foreign visitors
Agricultural landscape	18.23 by the residents	7.02 by the Cypriot visitors
Open beach front (public open beach)	22.93 by the holiday house owners 21.17 by the residents	15.57 by the Cypriot visitors
Archaeological site	16.48 by the residents	3.25 by the Cypriot visitors

The valuation of the environmental assets applying average values derived from the survey to the relevant population groups is shown below:

Table 6.5 Value of environmental ‘public goods’ in Pounds

Asset type	Category of respondents / beneficiaries				Total value
	1 Permanent Residents	2 Vacation house owners	3 Cypriot visitors	4 Foreign tourists	
Salt Lakes	214,440	36,440	1,191,600	1,301,690	2,744,170
Agricultural landscape	218,700	45,280	841,800	2,538,185	3,643,965
Open beach area	254,040	91,720	1,954,800	3,449,970	5,750,530
Preserving land with archaeological value	197,760	35,160	390,000	3,361,410	3,984,330
Total value	884,940	208,600	4,378,200	10,651,255	16,122,995

Notes:

1: value of sample respondents multiplied by the number of residents (12,000)

2: value of sample respondents multiplied by the number of vacation house population (4,000)

3: value of sample respondents multiplied by the number of Cypriot visitors (120,000)

4: value of sample respondents multiplied by the number of foreign visitors (221,000)

It is observed that the aggregate value attached to environmental assets by the residents is lower than the aggregate value referring to the tourists due to their numbers. Applying the values obtained from direct surveys to a relevant wider population is a standard methodological practice.⁴ Nevertheless, the values referring to the permanent residents (884,940) and of the vacation house owners may be classified as ‘value of local social benefits’ and the others applying to visitors (4,378,200 and 10,651,255) as ‘value of wider social benefits’.

Table 6.2 Consolidated Results - The Benefits of the Coastal Environment

Type of benefit	Sector	Estimated value (in CyP)	Note
Economic benefits	A. Market price information		
	(i) Summer accommodation market		
	Tourism hotel accommodation	1,237,714	(1)
	Holiday housing	4,298,052	(2)
	Village holiday apartments	124,323	(3)
	(ii) Restaurants and related activities	2,695,550	(4)
	(iii) Agriculture	1,331,200	(5)
(iv) Agricultural landscape	979,200	(6)	
(v) Larnaca Salt Lakes front row housing	3,273,600	(7)	

⁴ See for the Mediterranean GI. Constantinides 1993 and F. Juhasz 1993, and for wider reference D.W. Pearce 1998.

	<u>Value of Local Economic Benefits</u>	13,939,639 (14,000,000)	
Social benefits	B. Willingness to Pay information Local Social value for:		
	(i) Preserving open beach area	304,000	(8)
	(ii) Preserving agricultural landscape	263,980	(9)
	(iii) Preserving Salt Lakes	250,880	(10)
	(iv) Preserving archaeological site	232,920	(11)
	<u>Value of Local Social Benefits</u>	1,051,780 (1,052,000)	
	Total Estimated Value of Local Benefits (Economic and Social)	15,052,000	
	Estimated Value Wider Social Benefits		(12)
	(i) Preserving open beach area	5,404,770	
	(ii) Preserving agricultural landscape	3,379,985	
	(iii) Preserving Salt Lakes	2,493,290	
	(iv) Preserving archaeological site	3,751,410	
	Total Estimated Value of Wider Social Benefits	15,029,455 (15,000,000)	
	Total Benefits per year	30,052,000	

(1) 40% of hotel accommodation annual revenues from 407 beds. The factor of 40% is adopted on the basis of the price differential of beach and back of beach average housing prices roughly approximating also the observed differential of average prices of inland hotels in non mountainous locations in several other locations.

(2) 40% of the annual 'production' for front row and 30% for back row holiday houses (1,023 and 1,024 respectively) attributed to the coastal location. 40% is adopted as the lower percentage, given the range of 40-52% variation relative to non-coastal houses.

(3) Revenues from 77 village apartments based on mid occupancy of 75% applying 30% price factor.

(4) The coastal villages account for about 65% of all restaurants and other tourist establishments in the study area indicating the non-local demand for these services, allocating the 35% to local demand. Applying this factor to the estimated annual production of between 3,654,000 and 4,640,000 Pounds gives an estimate of 2,695,550.

(5) 40% of the revenue from artichokes production being the difference between the production level in the 3CPA relative to the production and revenue levels in the inland community of Dromolaxia.

(6) At least half (1,632) of all 3 village houses (3,264) have open view to agricultural landscape with a premium price of 10% over the rest of the housing stock. Rental value estimated at $1,632 \times 500 \times 12 \times 0.10 = 979,200$.

(7) $1,705 \times 500 \times 12 = 10,230,000 \times 0.32 = 3,273,600$ (32% shows the reduction by 20% relative to the Pervolia beach front of 40% coastal value premium).

(8) Valuation attached to the open natural beach area (19 Pounds) by permanent residents and vacation house owners (16,000).

- (9) Valuation attached to agricultural landscape by permanent residents and vacation house owners (218,700 and 45,280 Pounds).
- (10) Valuation attached to the Salt Lakes by permanent residents and vacation house owners (214,700 and 36,440 Pounds).
- (11) Valuation attached to the archaeological sites in the area by permanent residents and vacation house owners (197,760 and 35,160 Pounds).
- (12) Valuation attached to those environmental assets by the Cypriot and foreign visitors according to the survey results worked out on the basis of the relevant population figures adopted.

In summary, of the total estimated benefits of **30.0** million Pounds, **14.0** million are local economic benefits (of which **7.5** million accrue to the housing market), **1.0** million are local social benefits and another **15.0** million are wider social benefits. The magnitude of the local social benefits of 1.0 million reflect the low local population level to which they apply (16,000), while the larger magnitude of the wider social benefits from the same environmental assets accrue to a larger population.

It is here important to emphasize that the estimated socio-economic value of benefits as shown above, reveals (a) the extent of direct economic benefits generated by the coastal environment (often recognized but not measured in policy making) and (b) particularly the extent of indirect social benefits (local and non-local) typically ignored.

6.2 Some caveats

1. As mentioned earlier, the estimate of environmental benefits presented in this Case Study is *partial* as it does not include *all* sectors and *all* beneficiaries but is confined to the main sectors notably housing / accommodation and agriculture, which interact directly with the coastal environment, and the revealed social preferences (demand) for the local coastal environment.
2. It does not include possible benefits accruing to the construction and transport sectors, the spin-off effects from re-spending from land sales, agriculture and the restaurant sectors, nor does it include the purely environmental benefits provided by the marine and coastal ecosystem itself. That would require a much larger study.
3. It should also be emphasized that, in environmental economics studies the estimation of the value of benefits is typically *approximate* given the limitations of the statistical information used and the assumptions necessarily made in all fields of economic analysis.⁵
4. However, the importance of the results, while reflecting economic values as accurately as possible, does not depend on strict 'laboratory type' accuracy as in the natural sciences, but on their *policy relevance* and the broader new conclusions to which

⁵ See among other work, Gl. Constantinides 1993, F. Juhasz 1993, D.W. Pearce 1996, Gl. Constantinides 2000, CAMP Israel 2000.

they lead about the value of the coastal environment illuminating hidden (and often missing) aspects in development planning and resource management. In the case of Cyprus this is particularly true as no such study has been done before.

5. The estimation of the value of the Salt Lakes made in this Case Study is certainly on the low side as it does not attempt to include the value attached to it by the national population as part of the natural heritage of Cyprus (*Ramsar* wetland site). To show this would require a full scale survey to assess *Willingness to Pay* or the cost of recreating it (if possible) to perform the same environmental functions.

6. It is well known however that the Larnaca Salt Lakes are an important feature in Cyprus as a whole. Its proximity to the Larnaca International Airport makes it a familiar environmental feature to all Cypriots who, if asked, would certainly express *Willingness to Pay* for its visual enjoyment value and improvement through the management plan now under consideration by an inter-departmental team of experts. If such a study is made it would most probably show benefits by far larger than the cost of an upgraded management strategy. Thus, no figure is assigned in the above calculations to the benefits of the Salt Lakes for the wider public to avoid possible overestimation.

6.3 More general observations

The result that should be stressed is that a total partial estimation of coastal benefits amounting to 30.0 million Pounds derives from a coastal area of about **9 km long**. This may legitimately be translated into a level of benefits of 3.3 million Pounds per km of coast. If this is applied to the coast of Cyprus with similar environmental features (roughly about 100 km) it would imply a level of benefits of 330.0 million Pounds. This should not be a surprising extrapolation given that the economy of Cyprus is crucially dependent on its coastal activities rendering Cyprus a '**coastal economy**'.

It is worth considering the results of earlier small scale benefits estimation studies in Cyprus. Two such studies may be sited in summary below:

- The Amakas Area study
- The Protaras Area (Fig Tree Bay) Study

Box 2 Summary results of two small scale coastal valuation studies in Cyprus

The Akamas Study (Natural coastal area)

The Study was conducted in 1995 as a background survey of the number of visitors entering the Akamas coastal area of Toxeftra-Lara Beach area. The survey counted the number of visitors, the amount of money they would be willingness to pay for the preservation of the natural coastal area in it natural state (no development at all) though a management plan. The enumerators were also asked to assign a travel cost associated with the visits.

The results were the following:

10-20 August visitors: 2,720 (average daily visitors = 272, applied to the 4 summer months = 32,640)

10-20 November: 1,414 (average daily visitors = 141, applied to 8 months excluding the summer months = 33,840)

-Total estimated number of visitors per year = 66,480 (75,000 according to 1995 estimates by travel agencies interviewed)

- Average Willingness to Pay = 20 Pounds per Summer period visitor = 652,800 Pounds

- Average Willingness to Pay = 25 Pounds per non-Summer period visitor = 846,000 Pounds

- Total estimated average Willingness to Pay per year = 1,498,800 Pounds

The travel cost presented a problem since the visitors came from different distances (various parts of Paphos District, some with rented cars and some by buses). They were instead asked to say how much they would be willing to pay to travel to the area and explore / enjoy the natural coastal environment. The resulting value varied between 5-10 Pounds with a dominant value of 6.5 Pounds per person. Thus an overall travel cost of 432,120 Pounds is adopted.

-The total estimation of coastal visitor benefits in Akamas (excluding the visitors to the villages entering the area through the villages) is 1,930,920 Pounds.

-The length of the specific coastal area in question extended over 7 km, thus the annual benefits per coastal km is estimated at 275,845 Pounds (excluding travel cost 214,114 Pounds).

Source: 'Economic survey of the southern Akamas coastal area (Toxeftra-Lara)' in Glafkos Constantinides '*Environmental Economics: Case Studies*', forthcoming.

The Protaras (Fig Tree Bay Area) Study (Densely built coastal hotel area)

The coastal area studied (2006) is 1 km long of sandy beach with 5 five-star hotels on the coast with a total bed accommodation capacity of 1,505 and an average rate of 75 Pounds per bed. At the back of the hotels there are several other hotels of roughly similar quality charging on average 50 Pounds per bed. The price difference between the beachfront and the back row hotels has been found to be 33% lower in the back row hotels. The difference is attributed to the location providing different view and contact with the beach itself. The beach front hotels are built with a vertical orientation to the beach and all rooms are classified as beach view rooms. To estimate the value of the beachfront, 33% of the accommodation revenues were assumed to reflect that value.

- Estimated economic value of the beach to beach front hotel residents: $1,505 \times 240 \text{ days} \times 85\% \text{ average annual occupancy} \times 75 \text{ Pounds} \times 0.33 = \underline{7,598,745}$ Pounds.

- Beach visitors value: 1,000 visitors during the weekend days over 4 summer months (32 days) willing to pay up to 4 Pounds for a chair and umbrella, and 500 visitors during the week days over 4 summer months (88 days) willing to pay up to 2 Pounds for a chair and umbrella. Thus, the total visitor money-backed preference for enjoying the beach is estimated at 216,000 Pounds (128,000 + 88,000).

Total estimated value of coast: 7,814,745 Pounds (7,598,745 + 216,000). Thus the annual estimated value of benefits per coastal km is equal to 7,814,745 Pounds.

Source: 'Economic Survey of the Fig Tree Bay in Protaras', in Glafkos Constantinides '*Environmental Economics: Case Studies*', forthcoming.

The two studies show higher environmental value of the coast in development relative to the environmental value of coastal enjoyment from beach access, but it should be stressed that the conservation benefits reported in the two studies do not consider the *wider social value* of open natural beaches which is expected to be particularly high as they rapidly get scarce. A survey should be carried out to establish this.

6.4 Applying the visitor value to a wider area – ‘benefit transfer’

This Case Study covers a broader visitor population relative to the Akamas and Protaras small scale studies cited above. The Case Study covers 16,000 resident population and 341,000 visitors. The results of this Case Study concerning the preference for maintaining open beach areas in their natural form is on average valued at just under 12.0 Pounds. On this basis the following valuation may be constructed for all four population categories considered.

Table 6.3 ‘Demand’ for the open beach area in the Case Study

	Total number	Survey average WTP / person	Total value
Permanent population	12,000	12.0	144,000
Vacation house owners	4,000		48,000
Cypriot visitors	120,000		1,440,000
Foreign visitors	221,000		2,652,000
Total			4,284,000

If the above figure is related to value per km of coast (9 km of coast) it gives a gross value of **476,000** Pounds. It is possible that this figure may be an overestimation because it assumes that *all* Cypriot and foreign visitor population in the Larnaca District actually visit the area. To guard against possible overestimation, a lower estimation can be presented counting (a) the permanent population, (b) the vacation house owners and (c) only a third of the Cypriot and foreign visitors to the Larnaca area actually visit the coast of the Case Study Area. The high and low estimates are shown below:

Table 6.4 Estimates of environmental value per km of coast

Higher estimation Cy P		Lower estimation Cy P	
Population	Value	Population	Value
375,000	4,284,000	129,000	1,548,000
Estimated value per km of coast (9 km)			
476,000		172,000	

The lower estimate figure of visitor benefits per km of coast of **172,000** Pounds compares with **214,114** Pounds for Akamas (densely built beach area) and **216,000** for Protaras (open natural coastal beach area). It is now useful to attempt to extrapolate the likely *visitor* social value of different beach areas using the above indicative values.

Table 6.5 Estimated value of the beach area of Cyprus by type of area

Estimated annual value of coastal benefits for visitors (demand by visitors)			
Type of area	Length of coast km	Value (million Cy P)	Data base
Densely built beach areas	50 km	10.8	Protaras value per km of coast (216,000 Pounds)
Open natural beach areas of ecological interest (Akamas and coastal Natural 2000 sites)	30 km	6.4	Akamas value per km of coast (214,114 Pounds)
Other open beach areas of lower scenic and ecological interest	100	10.8	Half of Akamas value per km of coast (108,000 Pounds)
Low density beach areas	116	20.0	Case Study <i>lower value</i> per km of coast (172,000 (Pounds)
Estimated social value of Cyprus coast	296	48.0	

Still, the visitor value of coast cited above of 48.0 million Pounds underestimates the *total* environmental value of coastal areas because it does not take into account the preference of people who may wish to ensure that the coastal areas are preserved, and be willing to pay for their preservation in their natural or near natural condition or for low density development for enjoyment. Surely, almost all Cypriots would be concerned if all the beaches become densely developed (like Protaras) and they could only enjoy the coastal environment in its developed constructed ('artificial') state. So, it is methodologically legitimate to assume (until a full such study is made) that Cypriots attach value to the **existence** of open natural beaches as part of the natural heritage for themselves and their children, *particularly as such beach areas become increasingly scarce*. It is an economic axiom that, over the years, scarcity will increase their value.

A rough *conservative estimate* may be proposed, notwithstanding reservation, based on the assumption that at least a *third of Cypriots population and an equal proportion of tourists* would value the **existence** and enjoyment use of the open beach areas. On this basis, the additional conservatively estimated annual value of benefits is close to 19.5 million Pounds. The calculation is based on using the Case Study Area value of 12.0 Pounds per person, adding a low 5.0 Pounds per person travel costs (17.0 Pounds) over a population of 1.150 million (350,000 Cypriot population and 800,000 tourists population).

Table 6.6 Total estimated annual value of Cyprus coast (visitor and 'existence' value)

Type of value	Estimated value million Cy P
Total visitor value	48.0
Existence value	19.5
Total estimated annual value of coastal environment	67.5

7.0 ENVIRONMENTAL MANAGEMENT AND POLICY ISSUES

7.1 From local resource valuation to policy Development / Environment policy issues

This Case Study takes as its starting point the estimation of the size of the local economy as reflected its estimated Local Gross Domestic Product (Local GDP, see Chapter 4). The *size* of a local economy is measured by the total estimated value of the goods and services it produces and its *structure* by the sectors that produce that product. This is always a sound starting point. The next step is to show and highlight the importance of the coastal environment using that economic information. This is done mainly by identifying and measuring the value of the coastal environment as reflected in the economic and social activities that draw 'services' (economic or social) from the coastal environment. This brings into a policy context the fact that loss of environmental quality is an economic and social loss, a realization that goes some way towards justifying the implementation of ***Integrated Coastal Area Management (ICAM)*** and measures to prevent environmental damage. Specifically, this Case Study lends support to ICAM by highlighting, among other issues, the following:

- First, the coastal environment is a major factor in the production sector of the area, particularly the housing sector and the agricultural sector.
- Second, the coastal environment has a value greater than its direct contribution to the productivity of holiday housing and coastal agriculture when consideration is given to the social value attached by *the public* to the quality of existing resources for enjoyment and recreation.
- Third, the absence of appropriate financial / fiscal instruments associated with development / conservation decisions, the economic value generated by the coastal environment is not translated into financial flows to the local communities and the Government budget to increase coastal management expenditure for protecting, improving and managing coastal environmental quality.
- Forth, future development and coastal conservation decisions will create benefits distributed to different groups of people. While more development will create economic benefits to landowners, conservation will create environmental and indirect economic benefits to existing development owners / users. *Distributional issues*, overlooked in spatial planning decisions (zoning), have to be taken into account.

7.2 Assessing Development challenges

A striking feature of the economic structure of the Case Study Area is the apparent lack of *linkages* between the economic activities within the area as shown by the very limited interactions between *quasi-tourism* development (comprising almost exclusively holiday housing) and the local demand for agricultural products, retail trade and restaurant services.

The five largest economic sectors are those which in the other coastal areas are 'export sectors' addressing mainly external population demand, that is to say tourism demand.

In the Case Study Area the share of the export oriented sectors account for about 61-65% of non-agricultural activity (being the share of the establishments in the three coastal communities in the total including those in the non-coastal community of Dromolaxia), compared with a share of well over 85% in the hotel accommodation-based coastal tourism areas of Paralimni and Ayia Napa.

Table 7.1 Number of Establishments – The fiver largest sectors (2005)

Community	Total	Wholesale & Retail Trade	Construction	Hotel & Restaurants	Transport	Real Estate & Financial Services
Dromolaxia	300	64 (21.33%)	80 (26.66%)	26 (8.66%)	15 (5%)	8 (2.66%)
Kiti	251	61 (24.30%)	29 (11.55%)	18 (7.17%)	16 (6.37%)	12 (4.78%)
Meneou	110	20 (18.18%)	24 (21.81%)	10 (9.09%)	9 (8.18%)	4 (3.63%)
Pervolia	113	16 (14.15%)	22 (19.46%)	19 (16.81%)	11 (9.73%)	8 (7.07%)
Total	774 (100%)	161 (21.80%)	155 (20%)	73 (9%)	51 (7%)	32 (4.13%)

Note: The above table excludes the sectors of household domestic staff (17%) and various personal services (9%) accounting for as much as 26% of all establishments but only 12% of total employment

Points worth stressing include the following:

- The Hotel & Restaurant Sector in Pervolia account for only 17% of all establishments and only 9% in all the villages, compared to close to 50% in other coastal tourist areas.
- The Wholesales and Retail Trade Sector accounts for 14% in Pervolia and for only 22% of all establishments in all the villages, compared to close to 30% in other coastal tourist areas.

Two factors reducing the tourist-generated linkages are relevant here:

- Unlike in other coastal areas, the type of coastal development does not include hotels accommodating longer-staying guests who would spend money on restaurants and other facilities within the local economy.
- The holiday house owners staying during the summer months and the weekends do not do their grocery shopping in the local market but tend to bring their provisions with them.

This pattern has its advantages and disadvantages:

- It is an environmental *advantage* that the area is comparatively free of traffic and night life noise due to relatively mildly tourism developed, but the advantage accrues mainly to the existing house owners who appear to seek quiet coastal holidays.

- It is an economic *disadvantage* for the local communities which derive very limited direct income benefit from 'tourism spending', except the past sale of land for holiday housing development.

This particular pattern of coastal development which does not create tourism spending cycles in the local economy explains the lack of linkages across sectors, particularly housing / agriculture / trade, causes concerns and justifies the need for considering the establishments of new sources of income for the local communities.

7.3 Assessing Conservation challenges

The planning system will most likely be under pressure to expand the zoning for holiday houses in the area. Possible target areas are along the coast of *Softathes* (in Kiti) and in the present re-allotment / land consolidation agricultural area between the back row beach area and the village of *Pervolia* (**Map 2**).

The merit of any environmental management tool (like Environmental Economics) rests on its ability to advise policy. Both development and conservation options are desirable and can be justified by valid but diverse arguments. Decisions made in the framework of the present planning practice, despite the stated commitment to the protection of the coastal environment, usually favour development mainly because arguments for environmental conservation seem unfocused and anti-development. However, if environmental and landscape conservation is viewed and assessed as a source of multiple benefits, the 'environmental choice' can be better defended and promoted with reference to environmental benefits, otherwise both areas (*Softathes* and the re-allotted open agricultural land / landscape of *Pervolia*) will most probably eventually be given to development at least partly on account of two factors:

- The undervaluation of the *social and economic* benefits of agricultural landscape;
- *Local pressures* leveraged by the local communities (and the new land buyers in both areas) for additional development to accrue land and development gains.

This case Study stresses that land use changes should be decided on the basis of a balanced assessment of the short term interests of the landowners favoured by the change, and the long term interests of society as a whole for maintaining environmental quality.

The conflict between short term and longer term interests in spatial planning cannot be resolved by the conventional impetus for zoning expansion, unless appropriate analysis is made of the interests of **all stakeholders** with a view to defining explicitly who is **gaining** and who is **losing** from land use changes. Environmental economic helps bring into policy focus these important distributional considerations which, among other things, draw attention to the long term interests of society and the future generations that current practice considers only in general and unfocused fashion.

Any land use change should consider the interests of four main parties:

- The land owners
- The neighbouring landowners
- Society as a whole
- The future generations

Development creates benefits to the landowners entering the development market, while conservation creates benefits to the existing land and house owners whose environmental quality and economic position are maintained and protected.

The analytical framework below attempts to show how future land use changes may be considered with emphasis on 'gainers' and 'losers' from the standpoint of the existing situation in the Case Study Area.

Three scenarios are considered:

- Major expanding tourism development zoning along the coast and housing zoning in the agricultural area,
- Limited expansion, and
- No further development.

Table 7.2 Framework for an assessment of future 'Gainers' and 'Losers' under various options

Development options	The land owners themselves	The owners of neighbouring development	Society as a whole	Future generations
No further development	Losing	Gaining	Gaining	Gaining
Some limited development	Partly losing	Partly losing	Partly losing	Partly losing
Major development	Gaining	Losing	Losing	Losing

Reflecting on the above, the issue of 'externality' becomes relevant as an underlying issue in economic evaluation of alternatives:

- In this particular case, 'externalities' means that as more development is added to the area it increases the benefits of the new entrants but reduces (*negative externality*) the amenities of the existing ones (like the textbook case of traffic increase on a busy road).
- Similarly, as the existence of the agricultural landscape contributes, even in small measure, to the value of holiday housing in the back row beach area and to the edges of the village housing area of *Pervolia* fronting the agricultural land (*positive externality*), there is an incentive for the existing house owners to favour conservation and no land use change. This would be at the expense of the prospective land owners who will benefit from the land use change. In both cases the

'*distributional effects*' become important, meaning that gains and losses are distributed unevenly.

The above points help us stress further the following policy issues:

- Increase of development through land use changes will benefit the landowners who have an incentive to press for new development on their land for capital gains and income.
- The **owners** of neighbouring developed properties (holiday homes) have an incentive to resist further development and favour conservation in order to continue enjoying the same level of amenity and property values.
- **Society as a whole** has an interest in conservation because no land gains are involved and conservation will secure scarce open space and pleasant agricultural landscape views.
- The interests of **future generations**, likewise, will be served by providing the option to enjoy the natural coastal environment and open agricultural landscape for many years to come.

In situations like this, where environmental conservation benefits some and penalizes others, decisions for either development or conservation should be accompanied by a further decision about the **policy instruments** to be used to lessen (compensate) the losses and moderate (capture) the gains involved in achieving sustainable development.

8.0 The Use of Instruments

Planning policy at present relies almost exclusively on regulation articulated and enforced by land use and density zoning provisions / standards. Planning regulation, apart from the issue of rigidity inherent in any administrative system, encounters the following two problems as a tool for environmental management, **first** it cannot address the distributions issue affecting the wealth position of the excluded landowners in the case of conservation, and, **second**, it often resorts to over-zone for development as an attempt to solve that distributional issue but at the expense of conservation:

Land use zoning leaves economic consequences unsettled. Land use zoning primarily has spatial objectives which are sometimes compromised to lessen the economic consequences that their enforcement may have on the development values of properties excluded. Zoning itself cannot address both the spatial and the economic issues in development, and its present use to do both proves inadequate for both.

Land use zoning leads to over-provision for development. Land use zoning distributes development rights through administrative action discriminating positively or negatively development opportunities in different areas to achieve degrees of protection or development according to planning and environmental objectives. As most communities perceive environmental protection as restriction on development, zoning consistent with such objectives is invariably resisted leading to over-zoning usually at the expense of environmental protection and infrastructure capacity problems. There is a general

tendency for over-zoning to pacify local reactions and this is clearly reflected in the zoning practice applied to most coastal areas allowing overdevelopment.

Given the importance of environmental quality for coastal development, in this and other areas, regulation alone will be an insufficient instrument for implementing sustainable development policies in the future. Environmental economics informs policy making and offers justification for combining regulation with economic instruments to correct for undeserved losses and unearned gains inherent in the use of zoning.

In the cases mentioned above (the western section of the coastal area in Softathes in Kiti and the land consolidation agricultural area in Pervolia) both present development as well as conservation potential and the choices will be crucial for sustainable development in the area. As environmental conservation will benefit some and penalizes others, decision making for either should involve a further decision about the policy instruments to correct externalities and secondly to raise revenue.

If conservation is the objective, and to the extent that conservation will be pursued through prohibition or restriction of further development, two issues will have to be faced: first some form of financial compensation for proven loss of any existing development rights in the conservation areas, involving budgetary costs, and second, creation of benefits for the land and property owners in the existing development zones who will enjoy increased environmental amenity. An alternative to compensation is the use of **transferable development rights** allowing the disaffected owners to use or sell the development rights elsewhere without financial burden on the budget. With regard to the second issue of the unearned benefits to the properties in the existing development zones, the owners should be made to pay for this benefit through the **property tax system** (local or national).

If some measure of development is the objective, allowing limited development through appropriate zoning extension to include new properties in development, a **betterment tax** should be applied on the land to be included in the new development zone for the 'unearned' benefit of being given increased development opportunities by the planning authority.

In both cases, the use of economic instruments, apart from correcting distributional issues (*externalities*) will **generate revenues** available for coastal management investment which will ultimately benefit the whole area.

There is now the question of the appropriation of revenues, in other words where will the money go. The preferred option is to deposit the revenues to a **Local Environmental Fund** for **reinvestment in the area** for environmental improvement expenditure.

This will not only increase the acceptability of the instruments but also channel finance to the local communities which are presently financially stricken and entirely dependent on central government transfers. The *Local Environmental Fund* will require legislative actions providing for its management. A guideline on this may be a partnership between central, district and local level administration in the management of the Fund. As the instrument does not exist at present, a second best option to the establishment of a local

level Fund would be a *national level Environmental Fund* which will then channel the funds to the local communities the same way as the existing transfers are made.

Further elaboration of the Economic Instruments proposed for application in Cyprus is made in the Report 'Proposal for the incorporation of Environmental Economics in the Cyprus policy framework.

9.0 LOCAL COMMUNITY FINANCE

The value of the coastal environment for development, enjoyment and coastal heritage integrity does not trickle down to the local communities because of the lack of fiscal instruments for the 'appropriation' of benefits by the closest resident local coastal population. Taking the case of Pervolia, the annual local authority budget (2006) comprises expenditure of 652,200 Pounds and revenues of 525,500 Pounds. Of the total revenue only 13,000 Pounds come from local property tax. Another of 87,500 Pounds (52,000 for refuse collection and cleaning and 35,000 for street lighting) come from various direct charges, totaling 100,500 Pounds.

On the expenditure side, the local authority spends a total of 45,000 Pounds for various local services (refuse collection, street cleaning, beach cleaning and maintenance of public green open spaces) and 145,000 Pounds for staff. The percentage of locally raised revenues against total revenues is 8.5%, the remaining being central government transfers and contributions to local road and other schemes. There is clearly as case here for rethinking about opportunities for strengthening the financial position of the local communities which will also encourage local governance necessary for sustainable development.

10.0 SUMMING UP

This Case Study has been prepared with specific objectives in mind. The objectives derived from the underlying purposes to be served by CAMP Cyprus, mainly to explore, develop and put forward a set of tools for formulating and incorporating an integrated approach to coastal zone management. Environmental economics is one such important tool targeting the issues that concern the need for and the process of valuing coastal resources so that planning decisions will be better informed about the benefits that will accrue to society through sustainable development.

In this sense, this Case Study could not address all the possible issues of Environmental Economics and answer all questions of the interactions between the coastal environment and the coastal economy. Rather it concentrated its focus on showing as concretely as possible the main methodology followed to give substance to the general claim that 'the environment enriches development' or 'the quality of the coastal environment help diversify tourism and the quality of tourism product' and to show some measurable results that increase awareness of the practical uses of the analysis and quantification of benefits of resource management for policy making and future policy reforms.

This Case Study brings the issue of the socio-economic assessment of environmental benefits to the forefront of the planning process. This is supported in particular by showing the direct and indirect benefits that coastal resources, including landscape,

generate to the sectors of holiday housing, agriculture, the restaurant sector, while also identifying the extent of social benefits which although outside market transactions nevertheless people value for current and future enjoyment and heritage preservation.

The Case Study also dwelled on the importance of the issue of being mindful not only of the generation of benefits but also of the distribution of benefits across various interested parties involved in coastal development, particularly useful in addressing concerns about the social outcomes of planning and zoning decisions. It is socially important to be aware whether the benefits of conservation accrue to existing housing owners in the form of protected amenity, while penalizing the landowners, or the benefits of development accrue to the local community or to national level corporate interests.

Following from these issues, the Case Study also discusses the scope for applying Economic Instruments for correcting externalities and distributional outcomes as well as raising revenues for increasing environmental investment, an initiative which goes some way towards addressing the concerns often raised by the Ministry of Finance in allocating increased funds to environmental investment and Integrated Coastal Area Management actions.

The ultimate contribution of this Case Study to sustainable coastal development in Cyprus will be achieved through helping in the process of incorporating Environmental Economics in the planning policy framework. **To address this objective a proposal is put forward as a separate report specifically tailored to the circumstances of Cyprus and the structure of the planning process.**

ANNEX 1 – SUPPORTING INFORMATION OF THE ECONOMIC PROFILE OF THE AREA CHAPTER 4.0 REPORT

APPENDIX I.1: GDP VALUATION OF THE AGRICULTURAL SECTOR IN THE CAMP PILOT AREA
High estimate

	↓				Output		Selling value		Direct support		↓		Dromolaxia GDP
	area ha	area ha	% total	% total area	yield t/ha	output tons	€/ ton	value €	€/ha	value €	Total GDP value	% total value	
Vegetables	294,7		11,43%			7463		€ 3.328.800		€ 28.684	€ 3.357.483	48,01%	€ 436.473
Artichokes		88,7		3,44%	30	2661	€ 513	€ 1.363.977	€ 110	€ 9.715		19,64%	
Leafy and other veg		84		3,26%	20	1680	€ 598	€ 1.004.658	€ 110	€ 9.200		14,50%	
Potatoes		89,2		3,46%	35	3122	€ 308	€ 960.166	€ 110	€ 9.769		13,87%	
Animal Crops	362,8		14,07%			1287		€ 172.967		€ 58.286	€ 231.253	3,31%	€ 122.564
Mixed		58,8		2,28%	4	235	€ 137	€ 32.149	€ 110	€ 6.440		0,55%	
Wheat for hay		67,8		2,63%	5	339	€ 128	€ 43.441	€ 211	€ 14.295		0,83%	
Siphon		178,1		6,91%	4	712	€ 137	€ 97.377	€ 211	€ 37.551		1,93%	
Grains	1689,3		65,50%			3819		€ 558.343		€ 356.048	€ 914.391	13,08%	€ 493.771
Wheat		216,6		8,40%	2	433	€ 154	€ 66.615	€ 211	€ 45.668		1,61%	
Barley		1472,1		57,08%	2,3	3386	€ 145	€ 491.728	€ 211	€ 310.380		11,47%	
Fruit	79,7		3,09%			3558		€ 829.150		€ 8.072	€ 837.222	11,97%	€ 125.583
Melons		10,8		0,42%	35	378	€ 308	€ 116.253	€ 110	€ 1.183		1,68%	
W/ melons		33,2		1,29%	60	1992	€ 205	€ 408.424	€ 110	€ 3.636		5,89%	
Citrus		29,7		1,15%	40	1188	€ 256	€ 304.473	€ 110	€ 3.253		4,40%	
Olive and nut trees	71,4		2,77%			1133		€ 967.752		€ 50.807	€ 1.018.559	14,57%	€ 254.640
Olives		70,8		2,75%	16	1133	€ 854	€ 967.752	€ 718	€ 50.807		14,57%	
Greenhouses	6,1	6,1	0,24%			150		€ 683		€ 668	€ 626.016	8,95%	€ 87.642
Set aside	75	75	2,91%			0		€ 0		€ 110	€ 8.214	0,12%	€ 1.889
Totals	2579	2480,9	96,20%			18174		€ 6.482.360		€ 510.778	€ 6.993.138	€6.993.138	€ 1.522.562

APPENDIX I.2: GDP VALUATION OF THE AGRICULTURAL SECTOR IN THE CAMP PILOT AREA Low estimate

				↓	Output		Selling value		Direct support subsidies				↓	Dromolaxia GDP
	area ha	area ha	% total	% total area	yield t/ha	output tons	€/ ton	value €	€/ha	value €	Total GDP value	% total value		
Vegetables	294,7		11,43%			4301		€ 1.535.272		€ 28.684	€ 1.563.956	31,85%	€ 203.314	
Artichokes		88,7		3,44%	15	1331	€ 400	€ 532.200	€ 110	€ 9.715		11,04%		
Leafy and other veg		84		3,26%	12	1008	€ 450	€ 453.600	€ 110	€ 9.200		9,43%		
Potatoes		89,2		3,46%	22	1962	€ 280	€ 549.472	€ 110	€ 9.769		11,39%		
Animal Crops	362,8		14,07%			1287		€ 172.967		€ 58.286	€ 231.253	4,71%	€ 122.564	
Mixed		58,8		2,28%	4	235	€ 137	€ 32.149	€ 110	€ 6.440		0,79%		
Wheat for hay		67,8		2,63%	5	339	€ 128	€ 43.441	€ 211	€ 14.295		1,18%		
Siphon		178,1		6,91%	4	712	€ 137	€ 97.377	€ 211	€ 37.551		2,75%		
Grains	1689,3		65,50%			3819		€ 558.343		€ 356.048	€ 914.391	18,62%	€ 493.771	
Wheat		216,6		8,40%	2	433	€ 154	€ 66.615	€ 211	€ 45.668		2,29%		
Barley		1472,1		57,08%	2,3	3386	€ 145	€ 491.728	€ 211	€ 310.380		16,34%		
Fruit	79,7		3,09%			2989		€ 714.460		€ 8.072	€ 722.532	14,72%	€ 108.380	
Melons		10,8		0,42%	30	324	€ 308	€ 99.646	€ 110	€ 1.183		2,05%		
W/ melons		33,2		1,29%	40	1328	€ 205	€ 272.283	€ 110	€ 3.636		5,62%		
Citrus		29,7		1,15%	45	1337	€ 256	€ 342.532	€ 110	€ 3.253		7,04%		
Olive and nut trees	71,4		2,77%			1133		€ 792.960		€ 50.807	€ 843.767	17,18%	€ 210.942	
Olives		70,8		2,75%	16	1133	€ 700	€ 792.960	€ 718	€ 50.807		17,18%		
Greenhouses	6,1	6,1	0,24%			150		€ 683		€ 668	€ 626.016	12,75%	€ 87.642	
Set aside	75	75	2,91%		0	0		€ 0	€ 110	€ 8.214	€ 8.214	0,17%	€ 1.889	
Totals	2579	2480,9	96,20%			14443		€ 4.399.350		€ 510.778	€ 4.910.128	€ 4.910.128	€ 1.228.502	

APPENDIX I.3: GDP VALUATION OF FARMING IN THE CAMP PILOT AREA
High estimate

	KITI	MENEOU	PERVOLIA	DROMOLAXIA	TOTAL	% of Larnaca District
Dairy Farming						
No of farms	3	1	0	10	14	14,1%
Total no of dairy cows	339	118	0	919	1376	11,4%
Labour employed	13	3	0	27	43	
Average animals/ farm	113	118	0	92	98	
Sheep & Goat farming						
No of farms	15	0	10	67	92	11,1%
Total no of animals	1455	0	740	8449	10644	8,6%
Labour employed	24	0	14	94	132	
Average animals/ farm	97	0	74	126	116	
Output Total Value						
Milk	£549.330	£155.760	£51.800	£1.804.510	£2.561.400	
Meat, manure, subsidies &c	£247.200	£35.400	£74.000	£1.120.600	£1.477.200	
	£796.530	£191.160	£125.800	£2.925.110	£4.038.600	
Milk	€ 938.586	€ 266.132	€ 88.506	€ 3.083.188	€ 4.376.412	
Meat, manure, subsidies &c	€ 422.366	€ 60.484	€ 126.437	€ 1.914.659	€ 2.523.946	
	€ 1.360.952	€ 326.616	€ 214.942	€ 4.997.847	€ 6.900.358	

Assumption used

Average annual output sheep and cows	200kg
Average annual output dairy cows	5500kg
Price per ton sheep/ goat milk	£350/ ton
Price per ton dairy milk	£240/ ton

APPENDIX I.4: GDP VALUATION OF FARMING IN THE CAMP PILOT AREA
Low estimate

	KITI	MENEOU	PERVOLIA	DROMOLAXIA	TOTAL	% of Larnaca District
Dairy Farming						
No of farms	3	1	0	10	14	14,1%
Total no of dairy cows	339	118	0	919	1376	11,4%
Labour employed	13	3	0	27	43	
Average animals/ farm	113	118	0	92	98	
Sheep & Goat farming						
No of farms	15	0	10	67	92	11,1%
Total no of animals	1455	0	740	8449	10644	8,6%
Labour employed	24	0	14	94	132	
Average animals/ farm	97	0	74	126	116	
Output Total Value						
Milk	£429.665	£119.475	£43.956	£1.432.358	£2.025.454	
Meat, manure, subsidies &c	£247.200	£35.400	£74.000	£1.120.600	£1.477.200	
	£676.865	£154.875	£117.956	£2.552.958	£3.502.654	
Milk	€ 734.125	€ 204.135	€ 75.103	€ 2.447.329	€ 3.460.693	
Meat, manure, subsidies &c	€ 422.366	€ 60.484	€ 126.437	€ 1.914.659	€ 2.523.946	
	€ 1.156.492	€ 264.620	€ 201.540	€ 4.361.988	€ 5.984.639	

APPENDIX I.5: GDP VALUATION OF THE TOURIST ECONOMY OF THE PILOT AREA - 2006

										Estimates	
										High	Low
Registered CTO tourist accomodation											
Name		VILLAGE	CLASS	ROOM	FLATS	BEDS	Double room/ flat rates CYP	Double room/ flat rates €	GDP 100% occupancy	GDP 50% occupancy	
Faros Holiday Village	Hotel	Pervolia	***	134		250	£63	€ 107	€ 5.226.780	€ 2.613.390	
Three Seas	Hotel	Pervolia	**	52		99	£49	€ 83	€ 1.577.569	€ 788.784	
Elli	Tourist apts	Pervolia			7	16	£17	€ 29	€ 73.678	€ 36.839	
Kastania	Tourist apts	Pervolia			10	24	£20	€ 34	€ 123.828	€ 61.914	
Morfo	Tourist apts	Pervolia			9	18	£20	€ 34	€ 111.445	€ 55.723	
Source: CTO staistics						407			€ 7.113.300	€ 3.556.650	
Housing units situated in tourist zones											
	No of accomodation units (houses)	Monthly imputed rent	Annual imputed rent					GDP 100% occupancy	GDP 50% occupancy		
Secondary homes in tourist zone											
Pervolia	1557	862	€ 10.345					€ 16.106.897	€ 8.053.448		
Meneou	460	862	€ 10.345					€ 4.758.621	€ 2.379.310		
Kiti	30	862	€ 10.345					€ 310.345	€ 155.172		
Source: Community Councils data								€ 21.175.862	€ 10.587.931		
Apartments in residential zones used mainly for tourist accomodation											
				FLATS		Flat rate CYP	Flat rate €	GDP 100% occupancy	GDP 50% occupancy		
Pervolia				40		£20	€ 34	€ 495.312	€ 247.656		
Kiti				30		£20	€ 34	€ 371.484	€ 185.742		
Meneou				7		£20	€ 34	€ 86.680	€ 43.340		
								€ 953.476	€ 476.738		
Restaurants and other tourist operations								€ 6.300.000	€ 8.000.000		
GRAND TOTAL								€ 35.542.637	€ 22.621.319		

ANNEX II

Annex II

WILLINGNESS TO PAY (WTP) SURVEY CARRIED OUT IN THE PILOT AREA

ANNEX II: WILLINGNESS TO PAY (WTP) SURVEY

In the context of environmental economics the challenge for valuing environmental resources dictates the need for developing tools that can measure, in monetary terms, the non-use value of an environmental asset. Environmental assets by default are priceless, they are freely available to all humans to enjoy either for recreation or even in more abstract terms, for their aesthetic value. There is however a value associated with any asset which becomes apparent when it is in danger of depletion, degradation or development which limits the asset to a specific group of people, usually trading parties in real estate deals. This is the opportunity cost or the willingness to pay value that people place for preventing a negative outcome for selected environmental assets. This survey has set out to establish whether key environmental assets in the Pilot Area do have such a value and whether people's preferences for environmental assets in their natural state precede their preferences for heavily developed or otherwise man made distorted assets.

Description of the survey

The survey was carried out using the questionnaires in *Appendix II.1*, issued in both Greek and English languages between the 20th of August and the 20th of September 2007 in the Pilot Area. Respondents were randomly selected at the area through a number of on-site visits and respondents were personally interviewed. The questionnaire initially identified and segmented four broad categories of respondents, the identification of respondent type was implemented in **Section 1** and the breakdown is indicated below:

Type of respondent with regard to the Pilot area	No of people
Permanent residents	29
Owners of vacation housing	28
Foreign visitors / tourists	28
Cypriot day travellers/ visitors	28
Total Respondents	113

The average per person scores on all questions of the survey are marked and presented in *Appendix II.2*, next to their respective questions. Furthermore, the data collected has been analysed with a focus on the grouping of respondents as mentioned above. Reported data shows that on a number of occasions there is a significant variation in the replies among these groups.

Section 2 of the questionnaire attempts to identify in a broad sense, possible factors that have attracted respondents to the area. The options presented to respondents have been grouped into area specific and environment specific factors, given out in a mixed sequence format. The survey demanded only two replies from a selection of 9 and therefore it is important to clarify that low scores do not necessarily imply that people have a zero value for the option but rather that it is of less importance compared to the selected options. The summarised results of the survey that relate to Section 2 are shown on graphs 1-4 in *Appendix II.3*.

Section 3 is made up of ten separate questions requiring respondents to place a monetary value on endangered environmental assets or show their preferences

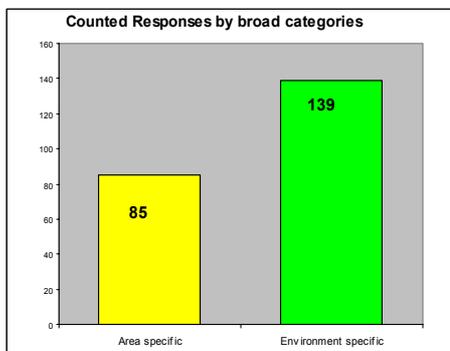
among alternative development scenarios, occasionally on specific locations within the Pilot Area. Four separate environmental assets have been distinguished and evaluated using the WTP method, as follows:

- a) The salt lakes
- b) The open agricultural landscape
- c) The coastal and beachfront areas
- d) Sites of major historical and archaeological value

Appendix II.2 is a summarised table reporting the average scores attained per person per category of respondent as identified in Section 1 and Appendix 1.4 provides a set of distribution graphs showing for each question, the number of replies per selected option of monetary value.

Factors attracting respondents to the Pilot Area (Section 2 of the Survey)

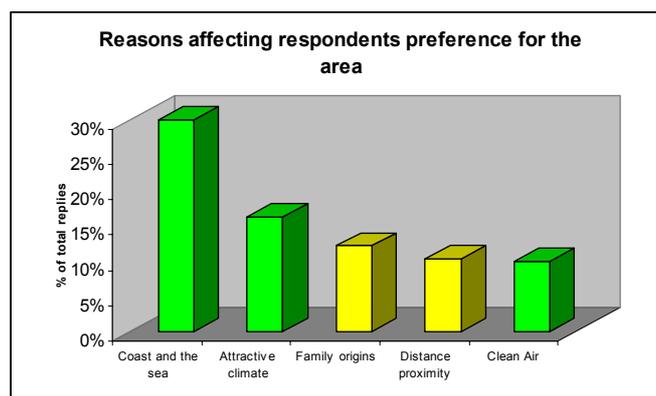
The resulting observations provide evidence to support that environment specific factors dominate people’s preference for the area (see graph below). Permanent to the Pilot region residents are an exception to the above observation, as their preference for choosing the area to live stems primarily from factors of family origins



and/ or inherited land available. All other group respondents, i.e. non-permanent residents, have shown a clear preference for the area with regard to environmental factors, focusing predominantly on the coastal character and the clean sea waters (30% of all responses) and on the attractive climate (16% of all responses). Conclusively, this section of the survey has revealed that people visit the area, either as short time travellers or as vacation housing owners because they have an appreciation

for its coastal environment which includes the accessible beachfront (ie not rocky but sandy beaches) and the clean sea waters for swimming. The attractive climate is an additional factor for preference which is closely tied to the coastal environment.

Yet, section 2 results are not in position to give the value that respondents place on their preferences for a natural environment versus a highly developed coastal area. Neither can we place a value on the opportunity cost of not having the environmental asset in its natural state. These questions are addressed and answered by looking at the data collected in Section 3 of the survey.



Willingness to pay Survey (Section 3) - Summary of findings for each environmental asset investigated

(a) WTP for maintaining the salt lakes as natural ecosystems: Questions 3.1 and 3.2 investigated the WTP of respondents for preventing tourist development within and at close distance from the salt lakes. Expressed differently, respondents were asked to set a non-use value for the salt lake ecosystem under a scenario of possible man made interference that will lead to degradation of the current natural state of the system. Average responses give an estimated figure for WTP of £10-£11 per person which rises to £20 for permanent residents. The value assigned by foreign tourists is much lower at around £6 and could be justified by the fact that this group of people cannot value much higher an environmental asset that they visit once, rarely or occasionally. The relevant Distribution Graphs give a high concentration of responses around the £5-£10 WTP options but a sizeable proportion of 12% of respondents placed a value of more than £50 indicating their strong support for maintaining the salt lakes in their natural state (the corresponding figure drops to 8% for preventing development on the banks of the salt lakes). As a conclusive remark, we have consistent evidence that people are not indifferent for the natural ecosystem of the salt lakes. Instead, they wish to see the natural balance maintained and are willing to pay to safeguard this. It would seem obvious that people living in the area develop stronger feelings for its natural assets, hence the resulting higher score by permanent residents. The resulting WTP figure could safely be extrapolated into the wider population, Cypriots and foreign travelers. Taking a conservative approach our extrapolation exercise gives the following figures (WTP values are taken as the average per respondent group between questions 3.1 and 3.2):

	Total number	Surveyed average WTP/ person	Total value
Permanent residents ¹	12,000	£17.87	£214,440
Vacation house owners ²	4,000	£9.11	£36,440
Cypriot visitors ³	120,000	£9.93	£1,191,600
Foreign visitors ⁴	221,000	£5.89	£1,301,690
Total			£2,744,170

1. *Permanent residents population 2002 (Statistical Census)*

2. *Vacation house owners based on 2006 Community data multiplied by 2 persons per vacation household*

3. *Cypriot Visitors assumed to include the whole population of Larnaca District (Statistical Census 2002)*

4. *Foreign Visitors statistics of 2006 visitors issued by the CTO for Larnaca District*

The figure of £2.7 million could be interpreted as the minimum value that people who are close to / visited the salt lakes place on preventing any sort of activity that will upset the natural balance of the salt lakes ecosystem.

(b) WTP for maintaining an agricultural landscape away from development: Questions 3.3 and 3.9 have attempted to get WTP estimation for preventing further development of open agricultural landscapes – alternatively measuring their non use value - and the replies are £14 and £10 respectively. Question 3.9 has further specified the land for conservation (between Pervolia village and the coast) and has defined the purpose of converting the land into a forest park using treated sewage effluents. As in case (a) above, responses received a higher score by permanent residents in both questions. It should be further noted that responses for question 3.9 are by 30% lower for all respondents' categories when compared to the replies of

question 3.3. As an interpretation to this one may opt for a generalized conclusion that people prefer rural landscapes in their natural state, free from human interference of any kind. We remain reserved for this conclusion as possible side effects could have indirectly affected the responses due to the multiple issues associated with question 3.9. An extrapolation table associated with an estimate of the minimum WTP value for preserving rural landscapes has been compiled below. The figures for WTP refer to the average replies per respondent type from questions 3.3 and 3.9.

	Total number	Surveyed average WTP/ person	Total value
Permanent residents ¹	12,000	£18.23	£218,700
Vacation house owners ²	4,000	£11.32	£45,280
Cypriot visitors ³	120,000	£7.02	£841,800
Foreign visitors ⁴	221,000	£11.49	£2,538,185
Total			£3,643,965

1. Permanent residents population 2002 (Statistical Census)

2. Vacation house owners based on 2006 Community data multiplied by 2 persons per vacation household

3. Cypriot Visitors assumed to include the whole population of Larnaca District (Statistical Census 2002)

4. Foreign Visitors statistics of 2006 visitors issued by the CTO for Larnaca District

During the field work relating to this survey, it has been observed that foreign respondents systematically placed a higher value on maintaining landscapes in their natural state compared to the salt lake system, which scientifically may have a higher environmental value than an equivalent area of agricultural land. In trying to explain this observation, the fieldwork has obtained verbal responses that tie WTP options with similar situations in their home land, hence the absence of a salt lake system reduces the intrinsic value of the asset vis-à-vis more common environmental assets.

We need to focus on the very high score attained in question 3.3 by permanent citizens who seem to dislike further opening up of residential land at the expense of agricultural landscapes that further leads to overcrowding of the area.

(c) WTP for keeping beachfront area in their natural state:

(c-i) Loss of open, natural beachfront - Question 3.4 looked for a WTP in maintaining the last 500m of open beach along the Meneou coast, free from housing development. A score that averaged £19/ per person was given, rated highest by vacation housing owners and permanent residents indicating clearly that they dislike further crowding of the beachfront area. We have to note that the replies received in this very specific and highly sensitive issue of 'the last remaining beach', gave the highest average score of all questions indicating a clear concern in favor of an environmental asset that has reached limits of development.

(c-ii) Pollution of sea waters - Question 3.7 has looked at the coastal asset from the angle of sea water quality and referring to a particular beach that is assumed to have been polluted from the effluents of a nearby factory. A score of nearly £18/ person was returned rated highest by vacation housing owners (£22.46) – apparently the beach presented here is familiar and is located in the heart of the vacation housing area.

(c-iii) Alternative beach development options - Unlike the above two questions which aimed at giving alert signals, by providing assumptions for extreme cases of endangered environmental assets, question 3.10 takes a slightly different approach by asking people to compare and place preference values on three different coastal development options. Data collected show that the least preferred beachfront is the one with crowded hotel development, with an average record of £5/ person. Interestingly, people have shown a slightly higher preference (£12/ person) for a beachfront that has been improved by an organized infrastructure that gives equal access to people to the beach (see relevant photo). WTP for keeping the beach natural ie with no man-made interference receives around £10 and ranks second in preference. The outcome of the survey for this question gives a clear message that respondents dislike beaches with high tourism development. Instead they would prefer to see the coastal area remain natural or be improved in a manner that improves access and creates facilities while maintaining the open beach area. Policy makers should consider that foreign visitors have shown a marked preference (more than twice the value) over this type of coastal development rather than the option with crowded tourism development.

(c-iv) Putting a value on existing, non-endangered, environmental assets - Question 3.5 also investigates coastal preferences but takes a stance away from endangered environmental assets or alternative development options. It directly asks respondents to place a value for visiting beaches with different development characteristics. This is a WTP question which does not relate to an opportunity cost of not having on not enjoying an environmental asset but it rather tries to set a price for an existing beachfront type. This question was purposely placed to test the notion that people normally underestimate the value of natural assets when they are freely available and not in any danger of destruction/ loss/ degradation. The resulting data does confirm a widespread human behavior, equally applicable towards environmental assets, of neglecting the value of an asset that is freely available for people to enjoy. Hence, respondents placed the least value on their WTP for enjoying a natural beach simply because it is there, it is available for use and it is not in danger of degradation. It should be noted that the beach photos of questions 3.4 and 3.5 are from the same area but responses differ in each case due to the message each question conveys. Despite their inherent environmental value, beachfront areas are regarded to be with no value, a notion that changes when the same beachfront is under threat of development or its natural ecosystem endangered. Conversely, respondents in this question only placed a higher value on beaches where improvements or development have taken place. Such beaches would normally offer value added facilities that people are prepared to pay for enjoying.

Conclusively, the survey has given a WTP in favor of preserving coastal areas from development, though respondents are willing to accept and support actions that would create an infrastructure for better access to the beach and/ or create facilities that improve the coastal area but not distorting or heavily altering the coast through intense development. In calculating a common value for WTP as the opportunity cost of a coastal area we have taken the average of the data for questions 3.4 and 3.7 and compiled the table below:

	Total number	Surveyed average WTP/ person	Total value
Permanent residents ¹	12,000	£18.97	£227,580
Vacation house owners ²	4,000	£22.65	£90,600
Cypriot visitors ³	120,000	£16.40	£1,968,000
Foreign visitors ⁴	221,000	£15.35	£3,392,350
Total			£5,678,530

1. Permanent residents population 2002 (Statistical Census)

2. Vacation house owners based on 2006 Community data multiplied by 2 persons per vacation household

3. Cypriot Visitors assumed to include the whole population of Larnaca District (Statistical Census 2002)

4. Foreign Visitors statistics of 2006 visitors issued by the CTO for Larnaca District

(d) WTP for preventing development on land of high archaeological value:

Questions 3.6 and 3.8 have focused on assigning a value to sites of archeological interest. The two questions have been structured differently whereby question 3.6 sets a generalized approach to a hypothetical area and question 3.8 attempts to sample respondents using a specified area of known historical value, namely the area around the Medieval Rigena Tower at Pervolia. Furthermore question 3.8 attempts to compare alternative WTP options based on four distinct development scenarios. Question 3.6 received scores that have a marked difference among the categories of respondents, and an overall distribution that concentrates on the £2 and £5 options. The average rises to £11 due to an estimated 15% of responses at the <£50 options. The responses in question 3.8 give a clear and loud message that people have the least preference for housing development – in fact the sign pictured on the photo advertises a new development project that is due to start at this particular site. The two options that relate to small scale actions aiming to either maintain the site in its natural state or promote its historical value have received similar scores of around £6.30 each. Quite interestingly the highest score was given to development that will improve the site into a park with sport facilities. It is worth noting that options 3.8.1-3.8.3 received nearly 40% of their replies (each option separately) at the two top end values - £9 and £10, whereas option 3.8.4 received nearly 40% of the responses in the lowest two values £0 and £1 (see relevant graph 3.8). For extrapolation purposes, we have used the value data collected from question 3.6 since question 3.8 has limited the value of replies from £0 - £10 as it took a comparative approach.

	Total number	Surveyed average WTP/ person	Total value
Permanent residents ¹	12,000	£16.48	£197,760
Vacation house	4,000	£8.79	£35,160
Cypriot visitors ³	120,000	£3.25	£390,000
Foreign visitors ⁴	221,000	£15.21	£3,361,410
Total			£3,984,330

1. Permanent residents population 2002 (Statistical Census)

2. Vacation house owners based on 2006 Community data multiplied by 2 persons per vacation household

3. Cypriot Visitors assumed to include the whole population of Larnaca District (Statistical Census 2002)

4. Foreign Visitors statistics of 2006 visitors issued by the CTO for Larnaca District

The Survey and the associated data collected lead to three more broad conclusions:

- 1) People value environmental assets in favor of their natural form by at least £10/ person, a value that on average denotes their opportunity cost of obtaining or retaining the natural state of environmental quality.
- 2) People have a preference for environmental assets either in their natural state or improved with an infrastructure that protects environmental quality. These preferences are valued by at least two times more when compared to the value preference for assets where development projects have taken place.
- 3) People neglect the value of an environmental asset when it is freely available and its natural state and not endangered or depleted of its environmental quality.

APPENDIX II.1 SAMPLE QUESTIONNAIRE

ΑΡ. ΕΡΩΤΗΜΑΤΟΛΟΓΙΟΥ:

C.A.M.P. CYPRUS - QUESTIONNAIRE

Section 1: Respondent's Profile	
ΟΔΗΓΙΕΣ ΣΥΜΠΛΗΡΩΣΗΣ	ΧΑΡΑΚΤΗΡΙΣΤΙΚΑ ΠΡΟΣΩΠΟΥ
Ζητούμε με μερικές υποθετικές ερωτήσεις να τοποθετήσετε κάποιες αξίες σε θέματα που σχετίζονται με την ανάπτυξη και εκμετάλλευση των φυσικών πόρων της παράλιας περιοχής Περβολιών-Μενεού-Κιτίου στα πλαίσια του προγράμματος CAMP για την περιβαλλοντική διαχείριση παράκτιων περιοχών. Το πρόγραμμα χρηματοδοτείται από τα Η.Ε. με διαχείριση από την Υπηρεσία Περιβάλλοντος. Σκοπός μας είναι να μετρήσουμε την πρόθεση συνεισφοράς σε σχέση με περιβαλλοντικές ευαισθησίες. / We shall ask a few simple hypothetical questions so that you can place values on your perceptions with regard to the exploitation of the resources in the coastal area Pervolia-Meneou-Kiti. The questionnaire forms part of the CAMP programme for coastal management funded by the UN and managed by the Department of Environment. Respondents are asked to denote a quoted price which reflects their likely environmental preferences and concerns.	Σημειώστε √ όπου ισχύει
Ερευνητής	Μόνιμος κάτοικος Περιοχής / Permanent area citizen
Ημερομηνία	Ιδιοκτήτης παραθεριστικής κατοικίας Owner of tourist housing
	Τουρίστας διαμονής πέραν από 1 μέρα / tourist staying in the area
	Τουρίστας (αλλοδαπός) περιηγητής - Day traveller
	Τουρίστας (Κύπριος) επισκέπτης
	Σημ. Άλλες ιδιότητες περιλαμβανομένων εργατών, μόνιμων ή εποχιακών αποκλείονται
Section 2	
Να απαντηθεί μόνο από Μόνιμο κάτοικο της Περιοχής	Να απαντηθεί μόνο από Ιδιοκτήτη παραθεριστικής κατοικίας
Κοινότητα Μόνιμης διαμονής	Πότε αγοράστηκε η κατοικία
Πόσα χρόνια κατοικείτε στην Περιοχή	Συχνότητα επισκέψεων/ παραμονής 5 πολύ συχνά 1 πολύ αραιά
Αναφέρατε δύο κύριους λόγους οι οποίοι σας ώθησαν (αρχικά) να κατοικήσετε στην περιοχή	Αναφέρατε δύο κύριους λόγους οι οποίοι σας ώθησαν (αρχικά) να αγοράσετε παραθεριστική κατοικία
Τόπος καταγωγής ή κληρονομική γη	Τόπος καταγωγής ή κληρονομική γη
Χαμηλό κόστος γης για κατοικία / έτοιμη κατοικία	Κοντινή απόσταση από μόνιμη κατοικία
Ευκολία πρόσβασης στην εργασία	να αναφερθεί η πόλη/ χωριό μόνιμης κατοικίας
να αναφερθεί η πόλη/ χωριό εργασίας	Μικρή απόσταση από οικιστικά κέντρα
Το πολύ καλό κλίμα της Περιοχής	Το πολύ καλό κλίμα της Περιοχής
Το αγροτικό τοπίο με τις μεγάλες μη οικιστικές εκτάσεις	Το αγροτικό τοπίο με τις μεγάλες μη οικιστικές εκτάσεις
Το παραλιακό τοπίο	Το παραλιακό τοπίο
Ο καθαρός αέρας	Ο καθαρός αέρας
Η ποιότητα του νερού και η ευθυγραμμισμένη παραλία για θαλάσσια σπορ	Η ποιότητα του νερού και η ευθυγραμμισμένη παραλία για θαλάσσια σπορ
άλλο	άλλο
Να απαντηθεί μόνο από μη Κύπριο Τουρίστα	Να απαντηθεί μόνο από Τουρίστα (Κύπριος) επισκέπτης
How many times did you visit this particular region before?	Πόσο συχνά επισκέπτεστε την περιοχή
How did you hear about this particular region of Cyprus	Έάν επισκέπτεστε την περιοχή συχνά, για πόσες ώρες διαρκεί συνήθως η παραμονή στην περιοχή
Please mention the two main reasons for choosing this area for your vacation	Αναφέρατε δύο κύριους λόγους για τους οποίους επισκέπτεστε την περιοχή
because of low accomodation rates	Τόπος καταγωγής
because of the sea shore of the area and the suitable sea for swimming	Κοντινή απόσταση από μόνιμη κατοικία
because of the climate of the area	να αναφερθεί η πόλη/ χωριό μόνιμης κατοικίας
because it is near the airport	Μικρή απόσταση από οικιστικά κέντρα
because of the clean natural environment	Το πολύ καλό κλίμα της Περιοχής
because of its night life and good tavernas	Το αγροτικό τοπίο με τις μεγάλες μη οικιστικές εκτάσεις
because of its historical and archaeological value	Το παραλιακό τοπίο / η καθαρή και κατάλληλη για κοπλύμπη θάλασσα
because of its wide open agricultural scenery	Ο καθαρός αέρας
because of its wild life and the natural beuties around the salt lakes	Η ποιότητα του νερού και η ευθυγραμμισμένη παραλία για θαλάσσια σπορ
other	το πάρκο των αλικών
other	άλλο

COASTAL AREA MANAGEMENT C.A.M.P. CYPRUS - QUESTIONNAIRE

Section 3: Willingness to Pay - Non-use asset valuation

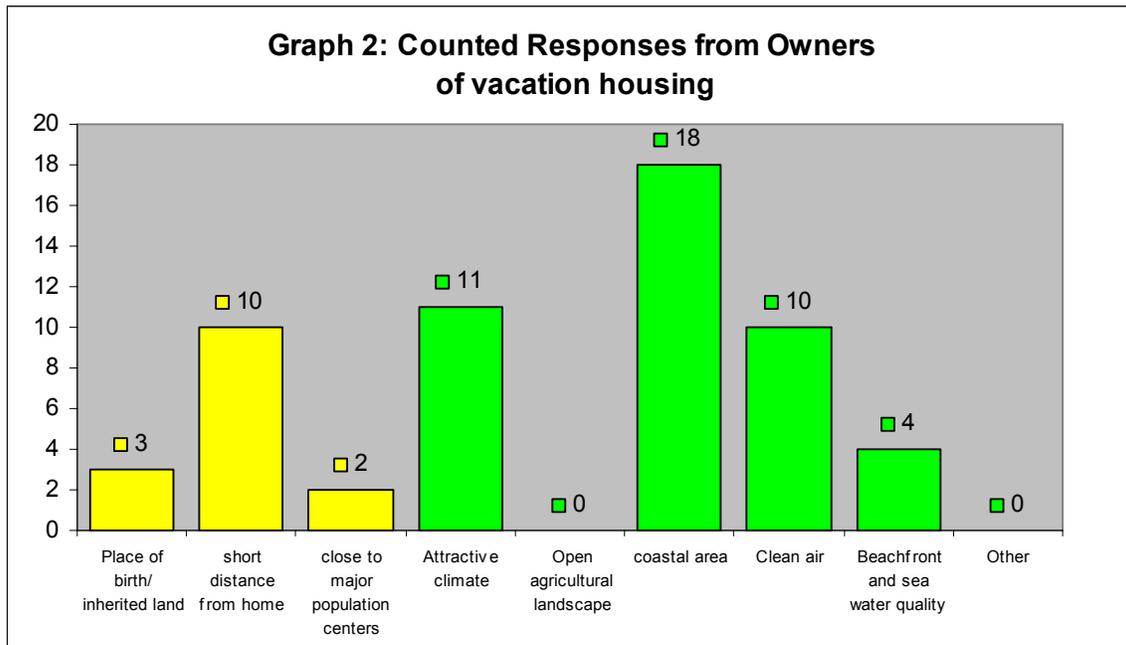
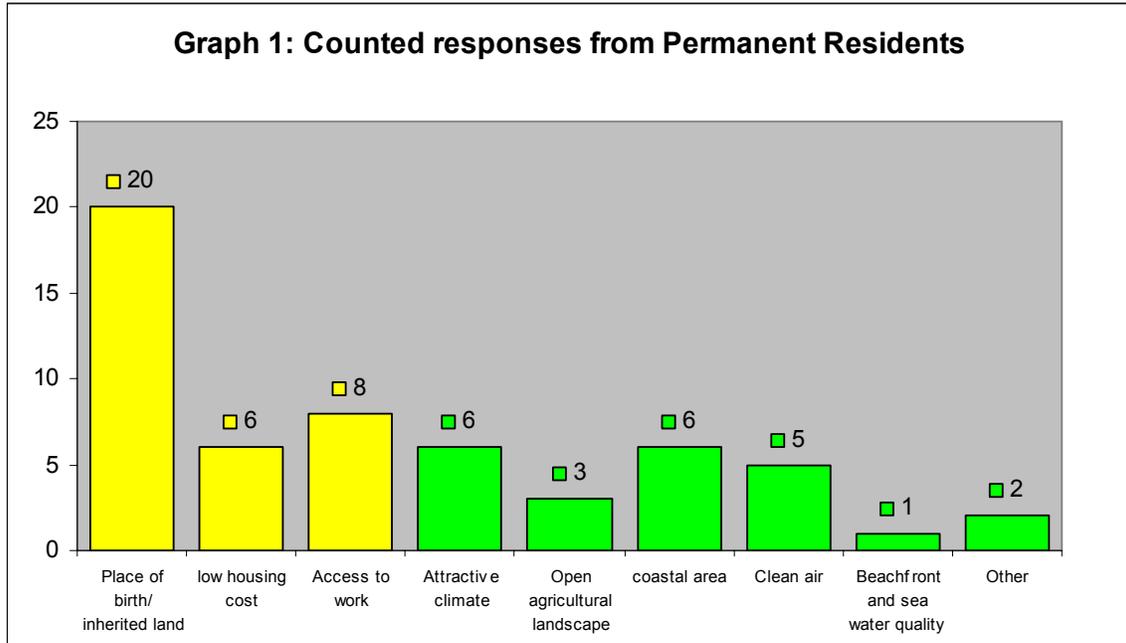
<p>3.1 Due to shortage of available housing land, part of the salt lake will be given out to housing and tourist development. Please assign your donation for a fund that will save the salt lake in its natural state.</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50		<p>3.6 An area within the Pervolia village of high archaeological value is due for development. We need your help for setting up a fund that will take the land and create an archaeological park.</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50	
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
<p>3.2 Assuming that hotel construction will soon be allowed on land adjacent to the salt lakes. How much would you be willing to donate in a campaign against this kind of development.</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50		<p>3.7 The beach below is polluted with the effluents of a nearby factory. As an Organisation for protection of the environment we ask for your help in collecting funds that will move the factory in a safer place and clean the beach.</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50	
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
<p>3.3 Assuming that we represent an environmental move against further housing development that will take away an attractive agricultural landscape, how much would you be willing to donate?</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50		<p>3.8 If we ask your opinion and your donation for developing the area around the Medieval Rigena's Tower in Pervolia, how much would you offer from £1 to £10?</p> <table border="1"> <tr><td>remain un-developed, as it is today</td><td></td></tr> <tr><td>be turned into a park with sports facilities</td><td></td></tr> <tr><td>be turned into a restored monument/ museum</td><td></td></tr> <tr><td>be given to tourist and housing development</td><td></td></tr> </table> 	remain un-developed, as it is today		be turned into a park with sports facilities		be turned into a restored monument/ museum		be given to tourist and housing development							
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
remain un-developed, as it is today																													
be turned into a park with sports facilities																													
be turned into a restored monument/ museum																													
be given to tourist and housing development																													
<p>3.4 Meneou coastline is almost hidden behind tourist houses with the exception of a small coast extending for 0,5km that is suitable for swimming which will soon be given for development. We need your help in setting up a fund that will take the land and maintain its natural setting.</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50		<p>3.9 A sizeable agricultural land between Pervolia village and the coast will soon be turned into residential zone. As people living in the area we set up a fund for buying the land and creating a small forest park using sewage treated water. We ask for your financial support.</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50	
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
<p>3.5 All three beaches below are open to the public with a daily entrance fee. How much would you be willing to pay for a day in each of the three beaches assuming that they have equally clean waters.</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50		<p>3.10 A coastal area alongside the faros beach in Pervolia will soon be developed for tourism purposes (picture c). We ask your help to either (a) buy the land and maintain its natural setting or (b) buy the coastal front and create infrastructure of the kind indicated in picture - b. How much would you donate for each project separately?</p> <table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50	
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
<table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50		<table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50	
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
<table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50		<table border="1"> <tr><td>nothing</td><td></td></tr> <tr><td>up to £2</td><td></td></tr> <tr><td>up to £5</td><td></td></tr> <tr><td>up to £10</td><td></td></tr> <tr><td>up to £20</td><td></td></tr> <tr><td>up to £50</td><td></td></tr> <tr><td>over £50</td><td></td></tr> </table> 	nothing		up to £2		up to £5		up to £10		up to £20		up to £50		over £50	
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													
nothing																													
up to £2																													
up to £5																													
up to £10																													
up to £20																													
up to £50																													
over £50																													

APPENDIX II.2 SURVEY RESULTS - SUMMARISED DATA

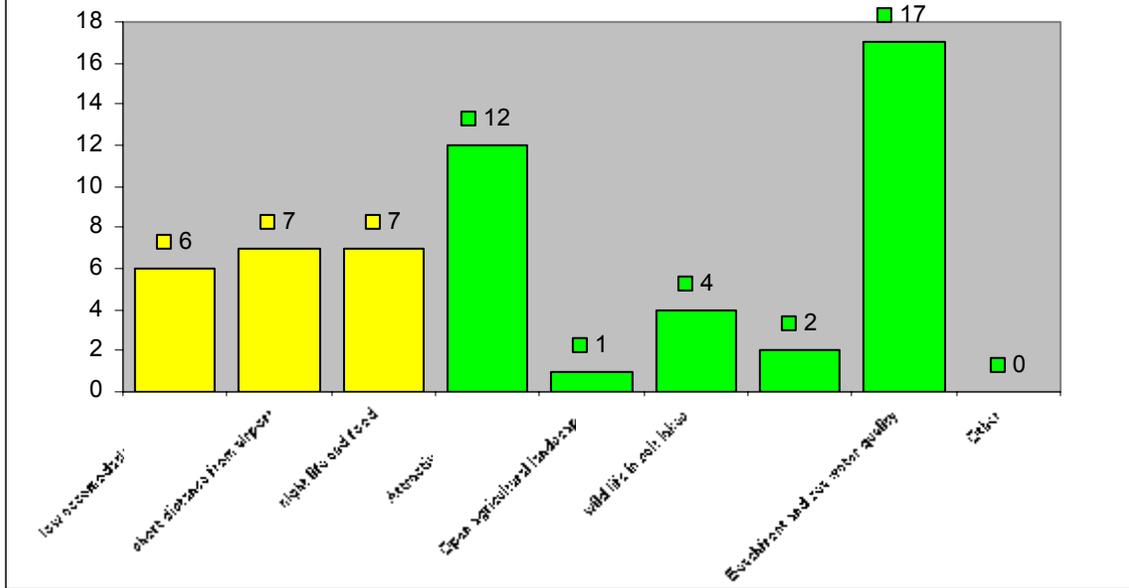
TABLE

QUESTIONS OF THE SURVEY			3.1	3.2	3.3	3.4	3.5			3.6	3.7	3.8				3.9	3.10		
Category			£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
1	Permanent Residents	Total money WTP	588,00	448,00	640,00	614,00	27,00	113,00	44,00	478,00	486,00	170,00	190,00	186,00	48,00	417,00	384,00	357,00	128,00
		WTP/ head	20,28	15,45	22,07	21,17	0,93	3,90	1,52	16,48	16,76	5,86	6,55	6,41	1,66	14,38	13,24	12,31	4,41
2	Owner of tourist housing	Total money WTP	262,00	248,00	369,00	642,00	22,00	43,00	114,00	246,00	629,00	216,00	199,00	189,00	96,00	265,00	295,00	349,00	206,00
		WTP/ head	9,36	8,86	13,18	22,93	0,79	1,54	4,07	8,79	22,46	7,71	7,11	6,75	3,43	9,46	10,54	12,46	7,36
3/4	Foreign Tourist	Total money WTP	160,00	170,00	237,00	456,00	131,00	143,00	124,00	91,00	463,00	183,00	200,00	176,00	127,00	156,00	278,00	356,00	153,00
		WTP/ head	5,71	6,07	8,46	16,29	4,68	5,11	4,43	3,25	16,54	6,54	7,14	6,29	4,54	5,57	9,93	12,71	5,46
5	Cypriot daily traveller	Total money WTP	338,00	218,00	353,00	436,00	39,00	92,00	103,00	426,00	428,00	147,00	148,00	162,00	96,00	289,00	234,00	289,00	99,00
		WTP/ head	12,07	7,79	12,61	15,57	1,39	3,29	3,68	15,21	15,29	5,25	5,29	5,79	3,43	10,32	8,36	10,32	3,54
	ALL SAMPLE	Total money WTP	1348,00	1084,00	1599,00	2148,00	219,00	391,00	385,00	1241,00	2006,00	716,00	737,00	713,00	367,00	1127,00	1191,00	1351,00	586,00
		WTP/ head	£11,93	£9,59	£14,15	£19,01	£1,94	£3,46	£3,41	£10,98	£17,75	£6,34	£6,52	£6,31	£3,25	£9,97	£10,54	£11,96	£5,19

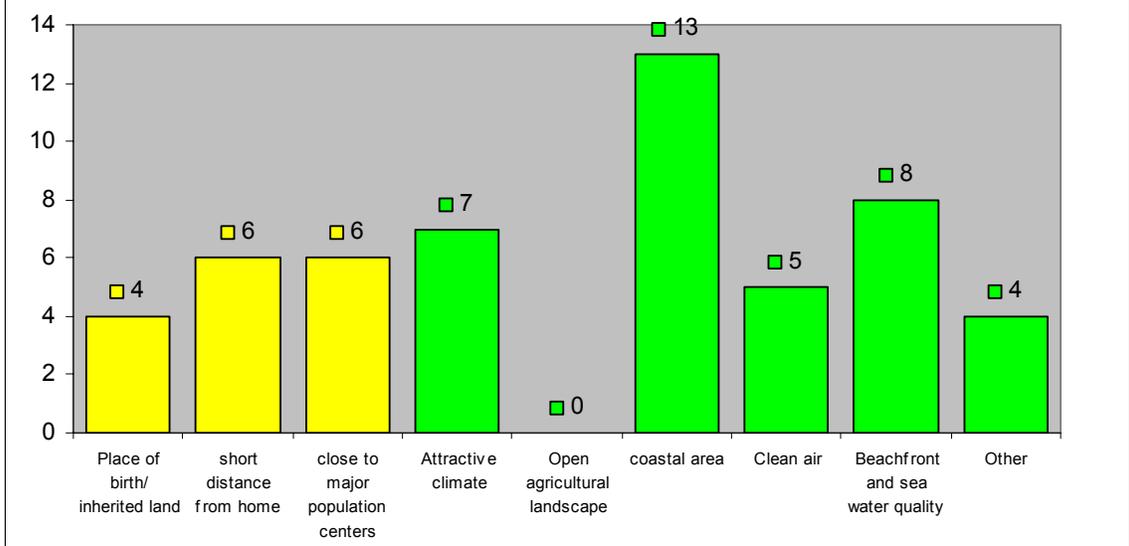
APPENDIX II.3 SURVEY, SECTION 2 DISTRIBUTION GRAPHS



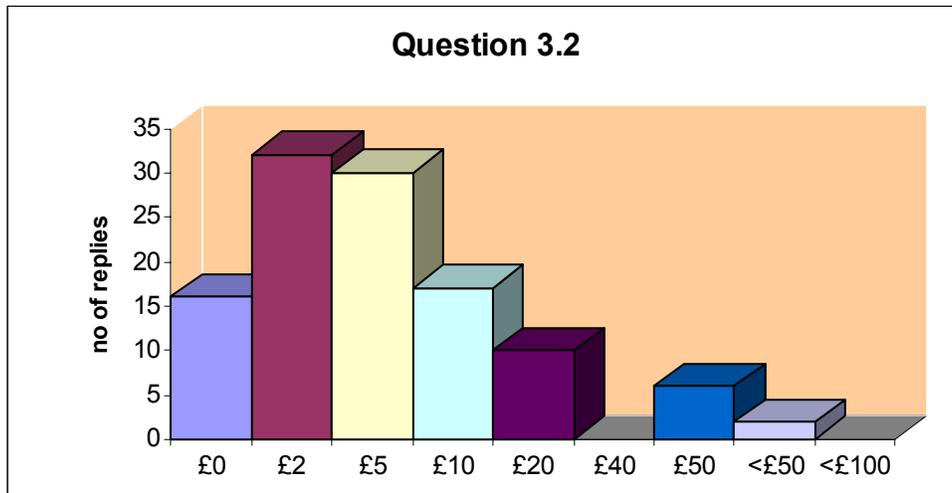
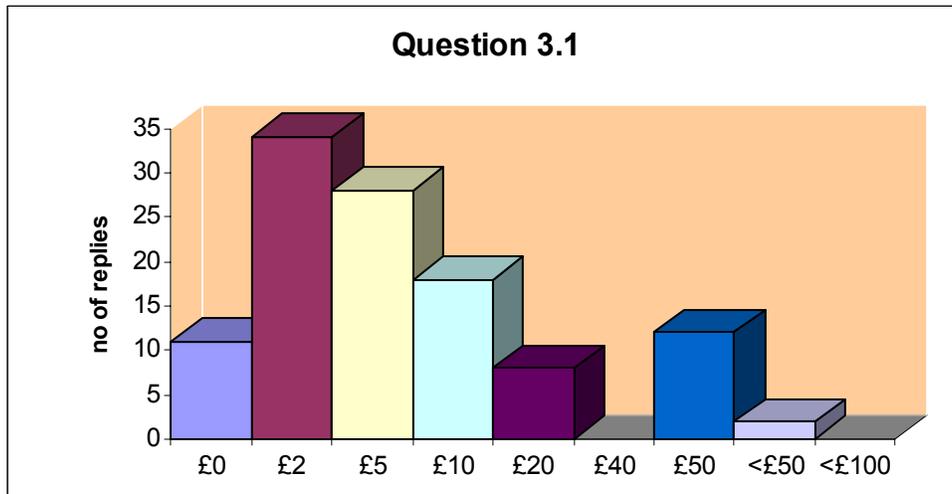
Graph 3: Counted Responses from Foreign visitors/ tourists

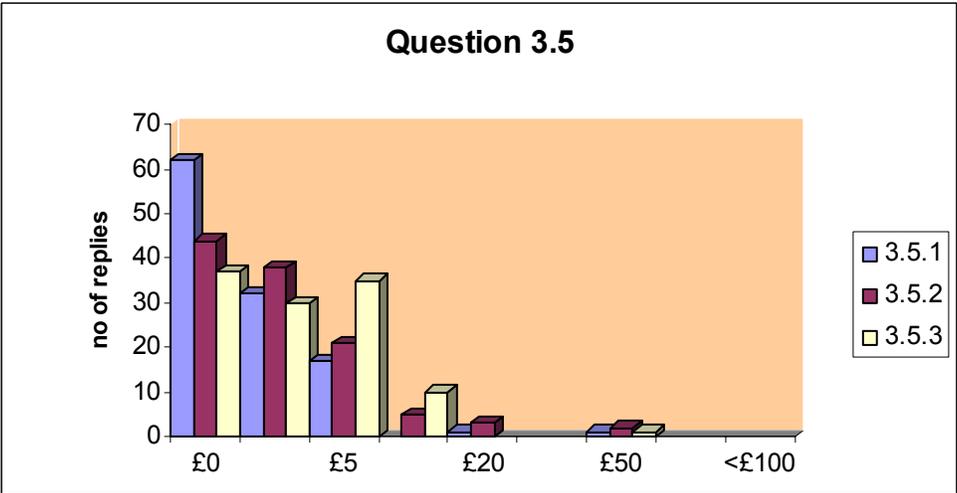
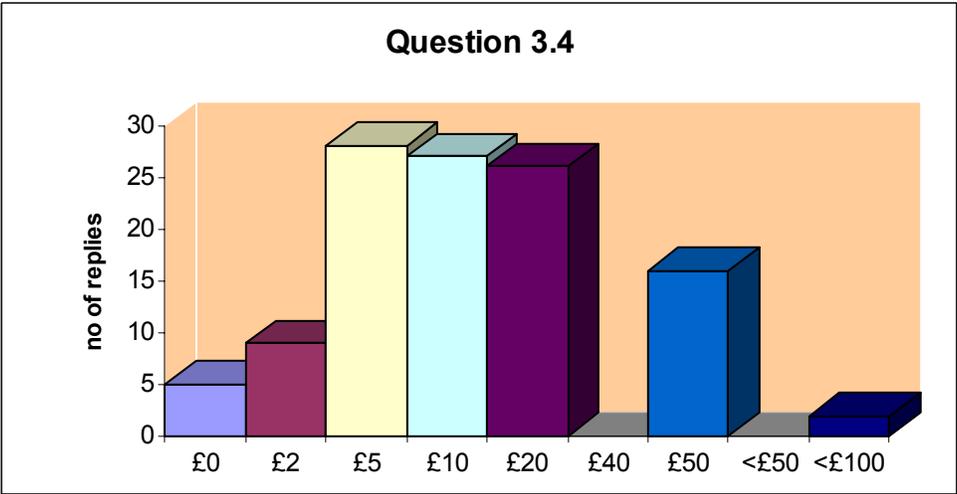
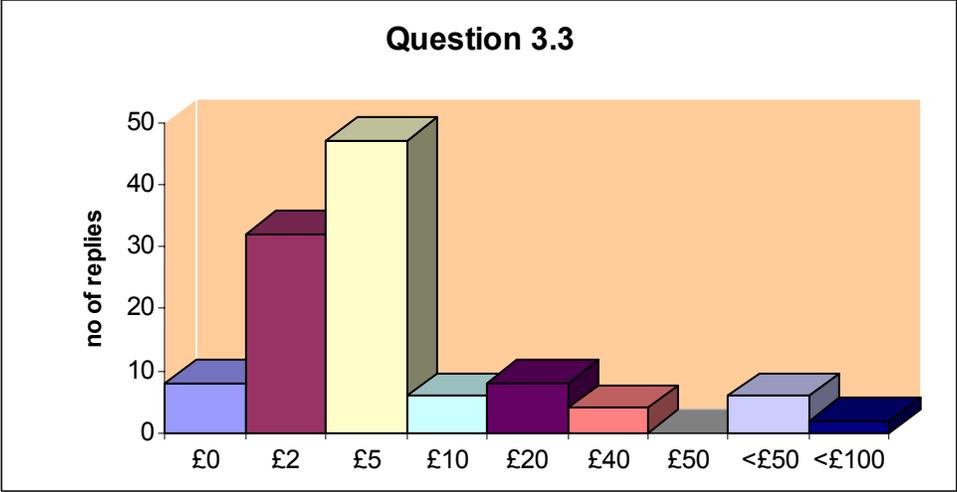


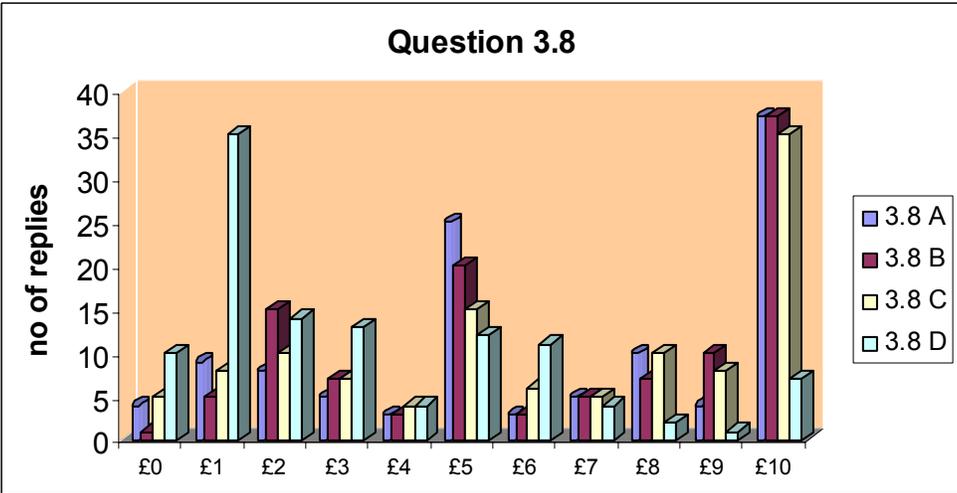
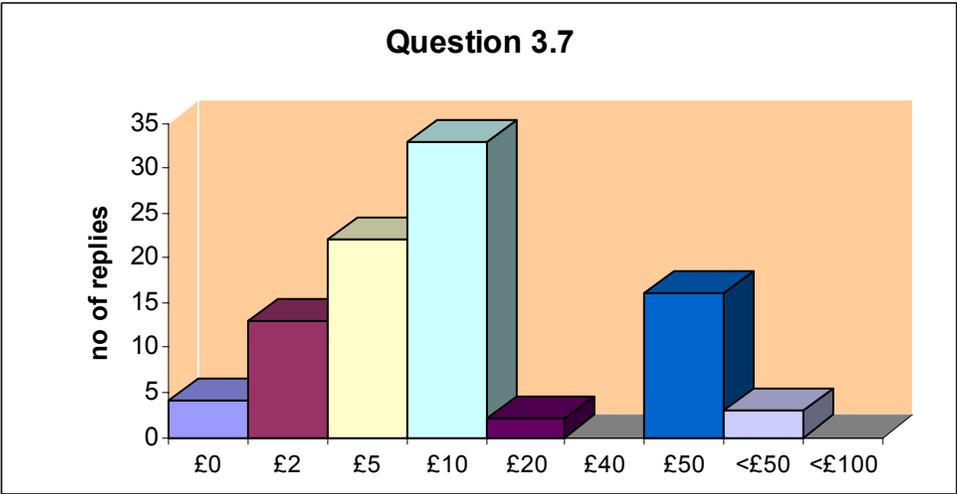
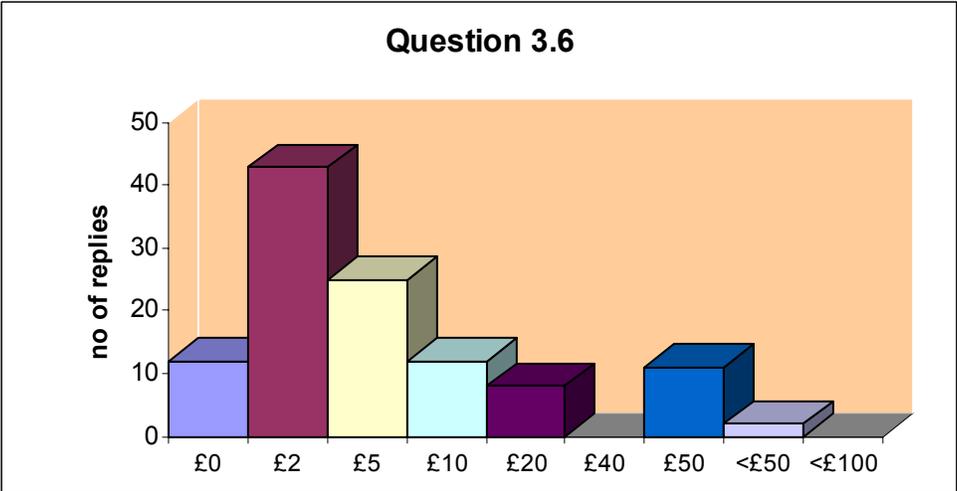
Graph 4: Counted Responses from Cypriot daily visitors



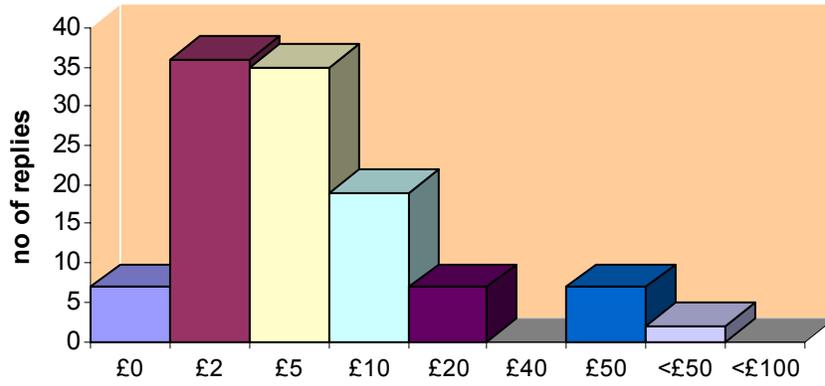
APPENDIX II.4 DISTRIBUTION GRAPHS



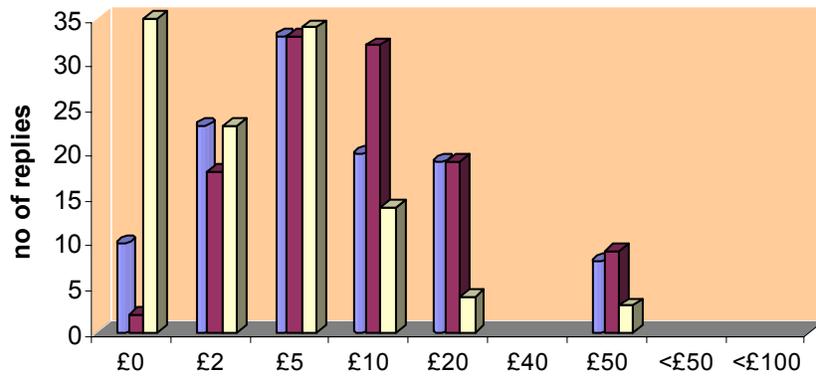




Question 3.9



Question 3.10



REFERENCES

T.I Balkas and F. Juhasz, 1993, "Costs and Benefits of measures for the Reduction of Degradation of the Environment from Land-Based Sources of Pollution in Coastal Areas: Case Study of the Bay of Izmir, Turkey", UNEP, MAP Technical Reports Series No. 72,

Barry C. Field & Martha K. Field, 2002, "Environmental Economics", McGraw-Hill

CAMP Israel 2000), "Study of Economic and Social Value of the Seashore", Report by Zenovar Consultants

David W. Pearce, 1993, "Economic Values and the Natural World", Earthscan and MIT Press

David W. Pearce, et. al. 1989, "Blueprint for Survival", Earthscan, London

David W. Pearce & J.Warford 1993, World without end: Economics, Environment and Sustainable Development

David W. Pearce & Dominic Moran, 1994, "The Economic value of Biodiversity", IUCN, Earthsca, London

David W. Pearce, 1998, "Economic Appraisal and Environmental Policy in the EU", EU and University College London

John A. Dixon and Maynard M. Hufschmidt, 1986, (edited), "Economic Valuation Techniques for the Environment", John Hopkins University Press, Baltimore and London, 1986

Giovanni Ruta, 2002, "Principles of Environmental Economics", World Bank

Glafkos Constantinides, 1993, "Costs and Benefits of measures for the Reduction of Degradation of the Environment from Land-Based Sources of Pollution in Coastal Areas: Case Study of the Island of Rhodes, Greece", UNEP, MAP Technical Reports Series No. 72

Glafkos Constantinides, 2002, "Economics in CAMPs", in 'Coastal Area Management Programme: Improving the Implementation', Report and Proceedings of the MAP/PAP/METAP Workshop, Malta, 2002

Glafkos Constantinides, 2002, "Cost Benefit Case Studies in East Africa" for the Global Programme of Action Strategic Action Plan for Sewerage

Jennifer Rietbergen-McCracken & Hussein Abaza, 2000 (edited), "Environmental Valuation", UNEP, Earthscan, London

Jean-Philippr Barde & David W. Pearce, 1991 (edited), "Valuing the Environment" Earthscan, London

Anil Markandya, Patrice Harou, Lorenzo Giovanni Bellu and Vito Cistulli, 2002, "Environmental Economics for Sustainable Development", Edward Elgar

Anil Markandya and Julie Richardson, 1992, (edited), "The Earthscan Reader in Environmental Economics", Earthscan, London

Anil Markandya et.al "Protecting Coastal Zones in the Mediterranean: An Economic and Regulatory Analysis", Prepared for SMAP III ICZM Programme, PAP/RAC, Split, Croatia

METAP-World Bank, Strengthening of the capacity in selected METAP countries to assess the Cost of Environmental Degradation (COED) in coastal areas, Egypt, 2006

METAP-World Bank, Strengthening of the capacity in selected METAP countries to assess the Cost of Environmental Degradation (COED) in coastal areas, Morocco, 2006

METAP-World Bank, (Maria Sharraf et.al) Strengthening of the capacity in selected METAP countries to assess the Cost of Environmental Degradation (COED) in coastal areas, Lebanon and Tunisia, 2006

Nick Hanley, Jason F. Shogren and Ben White, 2001, "Introduction to Environmental Economics", Oxford UP

Nick Hanley and Clive L. Spash, 1993, "Cost Benefit Analysis and the Environment", Edward Elgar

R. Kerry Turner, et. al. 1994, "Environmental Economics: An Elementary Introduction", Harvester

MAPS

Map 1 Study Area

Map 2 Zoning based on the 'Policy for the Countryside' Development Plan

Map 3 Locations of coastal environmental value