Environmental
Economics

Final Report
of the Environmental Economics Activity

CAMP Cyprus

UNEP

MAP

PRIORITY ACTIONS PROGRAMME

CAMP CYPRUS

Priority Actions Programme
Regional Activity Centre
Split, December 2007

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Acknowledgements

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.

Part I:

General Environmental Economics Guidelines

1. Environmental Economics – An Overview

1.1 Integration of Environment and Development – The Key Issue

Coastal overdevelopment and resource degradation more generally, emerging from the twin process of urbanisation and the drive for economic growth, are central environmental concerns in many countries. Of equal concern is the loss of open coastal areas for enjoyment and recreation available to the wider public. Often, the responsible Government authorities, faced with pressing obligations to pursue development objectives and job creation policies are constrained in implementing effective environmental protection measures by the need to ensure that development commitments are not compromised.

Integrated Coastal Zone Management (ICAM) is essentially a strategy adopted in many Mediterranean countries to incorporate environmental management in development policies and align development choices with coastal resource conservation.

1.2 Integrated Coastal Zone Management (ICAM)[1] [2]

Coastal areas are often the setting for a dynamic coastal economy. [3] ICAM has to come to terms with the dual role of coastal resources, both as ecological functions and socio-economic assets. Dealing successfully with this duality is perhaps the most challenging task of ICAM. To address this challenge and produce sustainable coastal development solutions, ICAM puts forward an integrated approach supported by several analytical elements and tools including environmental economics to deal with the interactions of the coastal environment with socio-economic forces.

The use of environmental economics in ICAM is not and should not be for the analysis of the economy of coastal areas in terms of its production, consumption and employment but for the analysis of the value of environmental quality for the sustainable development of coastal areas to ensure long term production, consumption and employment objectives. To do that, environmental economics has to be a viable part of an integrated approach to coastal management. There are, however, particular concepts, techniques, methodologies and data issues that support environmental economics, just like any other discipline involved in ICAM. It is therefore important to explain the rationale for environmental economics, the practical techniques which are available and applicable, the contributions they make, the data they require and the expected outputs.

1.3 The Essence of Environmental Economics – Some Basic Principles

Environmental degradation results from the way resources (primarily water and land) are used. The uses of coastal resources are subject to two main forces: **markets and policies**. The application of environmental economics seeks to contribute to the development of strategies for the future uses of coastal resources by identifying the markets which operate in a given coastal area and the appropriate policies that correct or strengthen market forces affecting environmental quality.

Analysis of markets and policies can be an elusive exercise and for this reason the focus should be on specific environmental issues of major concern involving particular markets and particular policies operating in the specific coastal area. In this context specific information is needed. To provide that information environmental economics focuses initially on the economic activities in a project area and their links with the environment.

This involves three salient issues (and areas of work):

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1 UNEP/MAP/PAP, 1997, Guidelines for Integrated Coastal Area Management in the Mediterranean.
2 UNEP/MAP/PAP, 1999, Formulation and Implementation of CAMP Projects.
3 UNEP/MAP/PAP, 2001, White Paper: Coastal Zone Management in the Mediterranean.

- The **spatial distribution** (locations) and *size* of economic activities relative to the location(s) of significant/vulnerable environmental resources;
- The **dependence** of economic activities on the quality of coastal resources, in other words the **contribution** of coastal resources to the productivity of economic activities (tourism, agriculture, recreations, etc.);
- The need and opportunities for **future policy changes** to influence the uses of coastal resources, and the **policy/economic instruments** that may be applied, so that environmental quality will actually support future sustainable development.

More specifically, doing this contributes sequentially to the objectives and outputs of ICAM in four major ways:

- First, generate *information* on the socio-economic structure of the project area as an element of the overall "*coastal area profile*";
- Second, provide a basis for *analysis and evaluation* of the importance of the coastal environment for economic activities (and hence of the economic value of environmental resources);
- Third, allow identification of options for development and conservation to inform public participation, decision-making, implementation actions and investments;
- Fourth, contribute to an *integrated approach* (ICAM) within which economics can strengthen the *socio-economic justification* for specific implementation proposals entailing limits to activities and the application of economic instruments for land use changes and/or revenue raising.

It is to be clearly understood that if the value of benefits from conservation is not identified, analyzed and measures, development and its benefits will overwhelm the policy making process leading to environmental damages and resource degradation.

1.4 The First Steps

Three important "organizational" issues have to be considered at the outset of any application of environmental economics:

- definition of the main problem and choice of the appropriate economic assessment approach;
- definition of the scope and limits of the analysis and the information required for the chosen assessment approach; and
- definition of the data collection method and valuation techniques.

Having decided on the above, the next step is to work on the following three main areas:

1. **A focused information gathering survey to identify the locations and size of economic activities in the Project area.** This will provide a clear understanding of the economy of the area and the sectors that comprise it (tourism, agriculture, construction, trade, etc.), the sources of impacts, if any, on the coastal environment to allow preliminary conclusions about the geographical focus of resource use conflicts.
2. **A rapid socio-economic assessment of the (main) economic and social activities whose "productivity" depends directly or indirectly on the quality of coastal resources.** This will allow (a) definition of the type, extent and value of the environment of the Project area for the economy and society and (b) clear understanding for assessing the benefits from coastal management actions aiming to preserve environmental quality.
3. **Formulation of development/conservation options** based on (1) and (2), to enable a balanced and integrated approach to such options for policy making. This is an important part of the work aiming to highlight the benefits of conservation / management which may otherwise be overlooked or overshadowed by the usually strong political bias towards development and its monetary benefits.

2. The Main Challenges and Rationale For "Valuing Environmental Resource"

The underlying purpose of going through the above three stages is to identify and measure the value of environmental resources so that it will be a useable tool in decision-making. Otherwise, environmental resources, despite their inherent *environmental value*, can be conveniently assumed by policy makers to be without any *social and economic value* to the area worth protecting and investing in its quality.

Valuing environmental resources entails several challenges including the following:

- *The problem of "partial information"* – Information on the value of the environment identified by its contribution to economic activities is missing or hidden. Therefore, *partial information* leads to a bias towards development. **Environmental economics provides the analytical and information support necessary for closing this "information gap" by bringing into focus the value of resources and the benefits from balanced policies for development and conservation.**
- *The problem of ignoring "non-use" values* – Environmental resources are valuable and provide benefits not only through their direct production and consumption uses (tourism, agriculture, etc.) but also in their natural form (nature protection, enjoyment, education, etc.), a value which is known to be significant but often under-estimated or sometimes even ignored in policy making. **When "non-use values" are ignored, the true value of coastal resources is under-estimated, therefore environmental resources are over-used, consequently damaged, degraded and, ultimately, reducing the flow of enjoyment benefits.**
- *The problem of elusive environmental awareness* – Environmental awareness is essential for ICAM. The challenge for ICAM is to give awareness of the value of the environment a sharp economic focus, a concrete socio-economic content and an operational role in implementation to justify the benefits of investment in reducing or avoiding environmental damages. **Expressing environmental values in economic terms, environmental awareness, far from remaining an elusive idea, becomes a major tool for ICAM implementation.**
- *The problem of "institutional sectoralism"* – ICAM is sometimes "locked in" within sectoral ministries/departments with little or no influence on financial and investment decisions. Effective ICAM implementation calls for a broader understanding of coastal development problems liked to economic causes and consequences. **Valuing environmental resources attracts the attention of economic and finance ministries who are called upon to pay for the costs of proposed measures and policy changes**.
- *The problem of "putting a value on the priceless"* – A usual misunderstanding among environmental specialists and other professionals of the concern of environmental economists for the value of the environment creates serious problems. There is a common objection among environmental scientists and activists to environmental economics on the grounds that "we cannot put a price on the environment" because, put simply, it is priceless, it is part of nature and beyond cold economic calculations. This position is 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 is expressed in their expenditures, actions in avoiding personal or property damages or preferences backed by how they spend money.

3. Methodology of Resource Valuation

3.1 The Starting Point in Resource Valuation

Resource valuation includes but is not limited to the monetary estimates of the value of resources. Preceding monetisation are two equally important tasks:

- defining the **types of benefits** involved, such as economic, social, health, recreational, etc.;
- assessing the **extent of benefits** involved, such as identifying their significance in relation to the project, action or programme.

The estimation of the **value of benefits** in money terms should only be attempted after the first two tasks have been completed.

3.2 "Categories of Value" in Environmental Economics [4]

The rule of market economics is that the value of a commodity or service depends on its use. Given the predominance of markets in resource allocation and development decisions and the use of market prices as a measure of value for most goods and services, environmental economists have developed a particular perspective on value appropriate for environmental resource management which allows consideration of non-market values. The "use value" of coastal resources in terms of production and consumption is only part of the multiple social value of environmental quality offered to society and therefore under-estimates total economic value which includes the non-use value.

Environmental economists take a comprehensive look at value, using the concept of **Total Economic Value (TEV)** to capture not only the Use Value (production value) but primarily the elusive Non-Use Value (conservation value) of environmental resources.

Box 1. Total Economic Value (TEV)

Total Economic Value (TEV) of a resource consists of:
- Use Value (UV); and
- Non-use Value (NUV).

Use Value may be broken down into
- direct use value (DUV);
- indirect use value (IUV); and
- option value (OV).

Non-use value includes:
- Existence Value (Biodiversity value).

Total economic value is therefore:

TEV= UV + NUV,

or:

TEV = [DUV + IUV + OV] + NUV

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

[4] This section draws from classic works on the subject including David W. Pearce, "Economic Values and the Natural World", MIT Press, 1993, R. Kerry Turner, et. al. "Environmental Economics: An Elementary Introduction", Harvester, 1994, Nick Hanley and Clive L. Spash, "Cost Benefit Analysis and the Environment", Edward Elgar, 1993.

The following table offers an illustration of the classification of the different categories of value of resources in their use or non-use services they provide.

Table 1: Categories of Value of Resources

A. Use Services of Environment			B. Non-Use Services
Direct use	**Indirect Use**	**Option**	**Existence**
Extraction of materials, quarrying and building development	Recreation Population visits to coast	Future use of direct and indirect services	Biodiversity Ecology Aesthetic aspects
Timber and fisheries	Aesthetic enjoyment – landscape		Common social heritage capital
Tourism accommodation	Habitat and marine species		Natural history education and research
Tourism services	Coastal protection and control against erosion		Heritage in relation to landscape features
Marinas			

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

- **Direct Use Value** corresponds to production and consumption of goods and services. This category of value is generally the easiest to measure by observable quantities and prices of products in a market context. The task of environmental economists is to record the quantity and price of goods dependent on coastal environmental quality (productivity approach). For example, tourism accommodation and prices reflect the productivity of the quality of coastal environment; over-building on the coast will reduce the use productivity of a particular coastal area.
- **Indirect Use Value** corresponds to the wider non production and consumption services provided by a coastal area. For example, wetlands filtering water, national parks providing opportunities for recreation, etc. Such "services" have value without any goods being extracted, produced or harvested, deriving from people visiting the particular coastal area. Measuring indirect use value is often more difficult than measuring production/consumption use value because the "quantities" of the service are not directly recorded in market prices. **Of particular interest is the "economic" value of rural landscape, wetlands and water bodies where attention is focused on their physical attributes and degradation risks, less attention is given to the analysis of their value to tourism, the "special interest" visitor markets and in many cases the property market.**
- Option Value **derives from maintaining the option of enjoying the direct and indirect benefits of a coastal site in the future. Often, the degradation of landscape quality is not interpreted in terms of social and economic damages incurred by local communities and the economic activities that would benefit from landscape quality.**
- **Non-Use (Existence and Biodiversity) Value.** In contrast to use value, non-use value corresponds to the value that people derive from the knowledge that the site exists and they form part of the natural heritage. People (when asked) do place a value on the existence of pristine coastal environment, marine habitat or species, coastal forest, sand dunes, turtles, whales, penguins, etc. Non-use value is the most difficult type of value to estimate.

3.3 Valuation Techniques Approaches

Resource valuation methods differ in terms of **how** they attempt to measure value. Some measure values directly in terms of existing markets, others indirectly in terms of "alternative markets" by applying proxies of behaviour to capture indirect and the non-use value. As mentioned earlier, the choice of the valuation technique(s) depends on the nature of the problem and the appropriate economic assessment approach, the scope and limits of the analysis. The Table 2 puts together the menu of the main valuation approaches used in environmental economics.

Table 2: Menu of Valuation Techniques/Approaches

Market based approaches			Willingness-to-pay approaches	
Change in productivity	Change in health	Habitat changes	Revealed preferences	Hypothetical preferences
Value of changes	Human capital changes	Opportunity cost	Property prices	Continent valuation
Opportunity cost	Medical costs	Replacement cost	Travel cost	
Replacement cost			Averting and preventive cost	

Source: *Based on Giovanni Ruta, 2002, "Principles of Environmental Economics"*

"**Productivity/Market-price methods"** estimate value through the productivity of coastal resources in production/consumption. Values are measured directly using market information. The most obvious example is when tourists pay higher prices to stay in coastal hotels relative to non coastal hotels. When "coastal substitutes" are constructed, the cost reflects the value of a coastal-like environment (**replacement cost**), while the loss of beach or coastal quality and the consequent deduction of the productivity of a hotel constitutes an **opportunity cost**. The expenditure incurred for coastal works to protect the coast and maintain a particular level of quality and productivity is preventive or protective investment reflecting the value of beach at a given level of quality. In cases where it is decided to protect a coastal area as open space, thus forego development and potential opportunities for income, the income foregone shows the cost of conservation or **opportunity cost**. This approach is particularly useful when financial resources need to be mobilised to fund conservation programmes and compensate local communities for the loss of development income (*Annex – Example of the opportunity cost approach*).

A strong word of caution is needed here: These approaches (replacement cost and opportunity cost) do not imply that all coastal resources which are essentially irreplaceable as parts of nature, such as coral reefs, marine habitat, etc. are replaceable with capital assets, but, in economic terms, some or most of their economic and social services may be replaced.

Estimation of indirect value of environmental resources uses a mixture of proxy prices to value, apart from biodiversity itself, the services of environmental resources to human activities (enjoyment, recreation, etc.). In this context, damages to or protection of those services may involving costs of restoration, replacement or improvement of environmental quality which can be used to guide the estimation of indirect values and benefits. In cases where proxy prices are not available or realistic, the techniques often used are based on the concept of **the Willingness-to-Pay** (WTP) and include the "travel cost approach", the "property/hedonic analysis approach" and, most importantly, the "contingent valuation approach".

The **"travel cost"** method is an example of a technique that attempts to deduce value from observed behaviour and uses information on visitors' total expenditure to visit a site assumed to reveal the "demand" for the site's services or beauty.

The "property/hedonic method" is widely used to examine the contribution of environmental attributes (quality) to property prices in attractive locations. A home in an aesthetically pleasing environment, for example, should sell for more than an identical home in another location without particular environmental links. It is logically assumed that the difference in the prices of properties (coastal and inland) will reveal the value of the coastal environment.

"Contingent valuation" relies on asking people directly about their willingness-to-pay to obtain or retain an stated level of environmental quality or attribute. The valuation can be obtained by questionnaires requiring respondents to name a money figure from a scale of values. This method is typically used to ascertain the value of **aesthetic benefits** and **the existence value**. In many countries contingent valuation is also used to value publicly or privately provided goods such as **water supply** and **sewerage** in areas without existing services.

3.4 Main Outputs and Benefits of Resource Valuation

- Considering and estimating the non-use value of the environment.
- Dealing with externalities.
- Promoting conservation. Streamlining economic criteria in environmental management.
- Assessing development/conservation alternatives.
- Bringing long-term environmental benefits into the decision-making process.

Table 3: Case Study Example – Paralia Coastal Town Summary Table – Monetary Valuation of the Socio-Economic Benefits of the Coastal Environment

Types of Benefits	Extent of benefits	Value of benefits ($ Million per year)	Valuation Approach Used
Tourist accommodation benefits	High	150.0	Productivity approach (in market prices)
Recreation benefits	High	80.0	Travel Cost and Contingent valuation
Existence (non-use) benefits	Medium	50.0	Contingent Valuation
Property value benefits	High	200.0	Hedonic approach
Estimated total		480.0	

This table allows salient conclusions to be drawn, including:

- On the basis of this specific example, it is possible to identify the main types of coastal area benefits, their extent and their approximate monetary value, as well as the valuation techniques used to suit the nature of benefits involved. The value of annual benefits, amounting to $480.0 million.
- In this particular example, direct use benefits accrue to tourism and are the highest (150.0). Indirect benefits, accruing to recreation are relatively lower (80.0 million), possibly subject to the problems of the travel cost estimates.
- The “existence benefits” of the coast, being the most difficult to estimate, are found to be important reflecting, in part, the valuation of people who are willing to pay for conservation policies that maintain the coast in its natural form.
- Caution must be exercised in what can be said about the estimated money values. They are approximate values whose significance does not depend on their accuracy but on their use as indicators for identifying and justifying policy options and decision making.

4. Guidelines for Data Requirements and Analysis for Resource Valuation

4.1 Data and Analysis

Resource Valuation Analysis can be undertaken at various levels of detail depending on immediate needs and project resources. Generally, it is advisable to focus on "rapid appraisal" tailored to the specific needs of the project, capable also of accommodating subsequent extension to address specific requirements for deeper analysis according to needs that may emerge.

- ***Step 1:*** Define the purpose of the EE Valuation Study;
- ***Step 2:*** Define the area of the Study;
- ***Step 3:*** Define the baseline data requirements.

The database should utilise as much as possible existing information sources, avoiding deep and costly research. Effort should concentrate on data directly relevant to the needs of the particular Project. The aim in the first instance is on basic information to construct the **economic structure of the coastal area**. Important baseline data include:

- **Population**: The size, the location and recent growth trends of the coastal zone population (immediate coastal zone).
- **Economic activities**: The composition of economic activities (hotels & restaurants, construction, transport, commercial services, agriculture, etc), the main locations and recent development and the leading development sector(s) in terms of employment and income.
- **Tourism:** Number of beds by category and location, number of tourists and bed-nights per year and percentage in summer peak season. Sector employment, including tourism services (restaurants, direct construction and transport) and tourism gross foreign exchange earnings. Eco-tourism, village-based accommodation and "special interest" hinterland tourism.
- **Second holiday homes:** Number of holiday summer houses used by national and expatriate visitors during the summer months and weekends.
- **Agriculture:** Areas of agricultural production, production levels by main crop and employment.
- **Particular activities or establishments in the area of local and regional economic importance** causing serious or some environmental impacts on resources
- **Particular Population Groups**:
  - Community Groups directly dependent on the use of coastal resources for their livelihood (e.g. fishermen, small-scale tradesmen);
  - Investor Groups (or stakeholders) directly economically active in the coastal economy, having an economic interest in the development of the coastal zone (hoteliers, developers, etc.); and
  - NGOs active in conservation issues, research, etc.

These data will provide a basis for **spatial mapping** needed to trace and review the interactions between the economic and environmental structure of the coastal area, such as:

- the pressures on the coast/conflict areas;
- the areas of complementarity between the coastal economy and the coastal environment; and
- possible major "hot spots" areas for particular attention and early actions.

Step 4:
Define the general approach to valuation. The general approach is typically to estimate the direct output values, the indirect service values and the ecological (existence) values of the coastal area, or segment(s) of it.

As values represent benefits, take account of the following three stages in dealing with benefits:

- define the **types of benefits** involved, such as economic, social, health, recreational, etc.;

- assess the **extent of benefits** involved, such as identifying their significance in relation to the project, action or programme;
- estimate the **value of benefits** in money terms even in approximate order as a start.

Step 5:

Define specifically the direct production activities to be included, concentrating on the most important:

- tourist beach accommodation;
- holiday housing in the area;
- other tourist beach establishments (restaurants, cafes, beach sport facilities);
- commercial fisheries production;
- coastal agriculture;
- other.

Approach to the analysis of the direct coastal area production:

- Number of tourist accommodation units (hotels and apartments), number of bed spaces and annual bed-nights, for the past 3-5 years.
- Prices (daily rate) of tourist accommodation.
- The difference in price between beach-located accommodation and similar quality inland accommodation (if relevant). The difference can be assumed to reflect the productivity of the coastal location. Total accommodation revenues per year in the two locations will provide an estimate of the annual value of the benefit of the beach for tourism accommodation. The same exercise should apply to breach facilities, restaurants and cafes.
- The annual commercial fish catches and their market value.
- Agricultural production and type of production in the coastal area by volume and value. This should be compared to inland agriculture ensuring comparison of similar production.

Step 6:

Define the indirect coastal area services to be included, concentrating on the most important:

- recreation beach areas;
- areas of natural beauty;
- diving areas;
- coastal archaeological sites;
- coastal forest, vegetation, sand dunes;
- other.

The purpose is to assess the use of such environmental assets providing opportunities for visits and enjoyment by people even though they may not produce direct production outputs.

Approach to the analysis of the indirect coastal services:

- Estimated or surveying the number of visitors per year, preferably during the summer months.
- If it is an open access area without entrance fees, estimated rough travel cost to the area (travel cost is assumed to reveal the value people attach to enjoy such sites in their present environmental condition).
- Use the average cost of travel, times the number of visitors, to obtain a total estimated monetary valuation of (or demand for) indirect coastal services such as amenity/landscape/marine quality.

Step 7:

Non-use (existence) value of the coastal area and/or selected sites.

This is the most important aspect of resource valuation; its purpose is to estimate people's valuation of (non-use demand for) conservation of environmental quality and landscape features of beaches and any other characteristics of the coastal zone. This aspect is often overlooked in conventional financial appraisals of development / conservation options. Since it is often difficult and not always necessary to cover all natural features, define the particular area or elements to focus on. It is advisable to focus on an area of particular environmental importance or an area proposed for change of use or under development pressure to make a clear point of policy relevance.

Research Approach

Use **Contingent Valuation method,** as there are no market prices to reflect the social valuation of present and future demand for the protection, preservation and management of open space. The end result should be an approximate estimate of “how much the area is worth” in social terms.

As there are no available data to use for estimation, a **designed questionnaire survey** is needed to obtain information from target respondent groups:

- tourists in hotel accommodation;
- national population in hotel accommodation;
- day visitors; and
- local population.

The questionnaire survey and sample size should be decided in light of budget resources but it is advisable to be sufficiently large to reflect reality. The main target of the questions will be to ask people to state how much they would be willing to pay to ensure that a particular site or area (described) is preserved as open protected area for the general public, rather than used for particular development. Respondents should be presented with a scaled list of “hypothetical” payments and directed to place a monetary value on the continued existence of the area as a natural asset for this and future generations as part of the national heritage. Respondents should know that they may not necessarily be called upon to pay the quoted price.

Step 8:

Putting it all together. The analysis should tabulate and present the results focussing on estimated approximate values for each category of value. It is almost certain that the results will contain ranges of values and approximations. However, all the assumptions made and the caveats in the data should be spelled out. Absolute accuracy is not the most important objective. What is important is to be clear what the results will show about the productivity of the coastal area and the demand for environmental quality.

Step 9:

It may be useful to include in the study particular areas that attracts public attention and are of special concern to the planning authority, to provide opportunity to link up with existing institutional, economic and policy-making issues in the national planning system, such as areas that have suffered degradation, beach access exclusion, etc., as a result of a project or other unsustainable practices (pollution, erosion, over-development, etc).

Reporting:

The results should be presented in a Report including summary tables and maps, plus statistical annexes as needed. A Draft Report with an Executive Summary and Conclusions should be prepared for discussion to allow and encourage responses for improvement. The Final Report should be in a language relevant and understandable to planners, coastal experts and decision makers who will use it in their work.

5. Shaping Up Environmental Economics for Working Purposes

5.1 Annotated Work Tasks and Outputs

Moving from data collection and analysis towards a usable coastal management-oriented framework, the following format is particularly helpful:

Table 4: Annotated Work Tasks and Outputs

Issues and Tasks	Expected Outputs
Analysis of the type, size and locations of economic activities	▪ Socio-economic structure of Project Area. ▪ Extent of actual or potential threats to the coastal resources in general terms (conflicts, constraints, opportunities).
Analysis of the dependence of economic activities on the quality of coastal resources	▪ Extent of present and future social and economic significance (or value) of coastal resources – type, extent and value of benefits of the coastal environment. ▪ Losses to be incurred through degradation of the coastal environment. ▪ Possible future development-conservation strategic options (basis for defining objectives of policy measures. ▪ Defining possible policy measures / instruments for sustainable coastal development.
Definition of future changes that need to be introduced to the uses of coastal resources	▪ Context for socio-economic justification for selected plan / policy actions. ▪ Scope for streamlining environmental priorities in development policies and budget allocations.

5.2 Suggested Contents of the Study Report

1. Brief description of the Area
2. Choice of the Area
3. The Economy of the Area
4. The Coastal Environment – Key environmental features and main resources
5. Why an Environmental Economics Study – Its purpose
6. The Value of environmental resources
   - 6.1. Direct
   - 6.2. Indirect
   - 6.3. Non-use value
7. Management and Policy issues
8. What does it reveal about conservation
9. Instruments
10. Wider policy conclusions and recommendations

6. Economic Instruments – The Issue of Sustainable Finance

A commonly perceived obstacle to ICZM implementation is finance. Increasing the awareness of Ministers and economic planners of the need to increase environmental investment is a major step forward, but the question will still remains how to finance the required investment. Many countries in the Mediterranean, if not all, face strict budgetary restrictions and Finance Ministries often straggle to finance the most crucial projects with higher perceived social and economic importance, e.g. to increase employment, secure macro-economic stability, reducing poverty, etc.

> ***Article 19 Annex III Draft Protocol on Integrated Coastal Zone Management in the Mediterranean:*** *For the implementation of national coastal strategies, plans and programmes, State Parties shall take appropriate measures to adopt relevant economic, financial and/or fiscal instruments intended to support local, regional and national initiatives for the integrated management of coastal zones.*

Typically, national environmental action strategies and plans, ICZM, etc., present enormous lists of investment needs corresponding to desired solutions to environmental problems amounting to many millions (if not billions) of dollars. Compared with current and planned budget expenditure implementation costs reveal insurmountable financing gaps. *Financing gaps* cannot on a long term basis be bridged by donor funds and international finance institutions. Failure to put in place a coherent demand-driven *financial strategy* to translate financial needs into real demand for finance is of crucial importance to environmental management.

6.1 Financial Strategy

The development of capacities for preparing and implementing financial strategies is the bridge from plans across to realization of the plans. Financial strategy means matching investment demand with available financing resources. There is often an imbalance. The response to this imbalance is often wrong typically including two features:

- assuming that the financing needs are constant and cannot be changed;
- adopting a “supply-driven” effort to ask for more funds (from where?) to increase the financial resources to implement all those actions proposed match them.

The core objective of the financing strategy is to close the financing gap by translate financing needs into manageable and feasible investment programme(s) corresponding to the phased actions to fulfill the most important environmental investment targets.

The financial strategy should be conceived as a two-pronged exercise: A demand side exercise of reducing “needs” down to the actual “demand” for funds, and a supply side exercise of increasing/mobilizing resources.

6.1.1 Demand Side Actions (Cost Review and Prioritization)

- Review of the list of financing needs identified or implied in existing or new plans to separate out those that are already under implemented or will soon start to construct the “baseline” investments.
- Update and scrutinize financial costs with a view to reducing gross overestimations. Closer attentions should be given to:
  - choosing a least-cost alternative;
  - avoiding over dimensioning of technical capacity in line with effective demand for created environmental services/infrastructures;
  - cost sharing opportunities by distinguishing public costs and private costs.
- Clarify critically that which each project/ expenditure proposal will actually achieve and whether it may be technically disaggregated/adjusted to lower its cost.
- Identify those investments with the highest social and developmental benefit so that the benefit/cost ratio will be higher than other high cost investments.

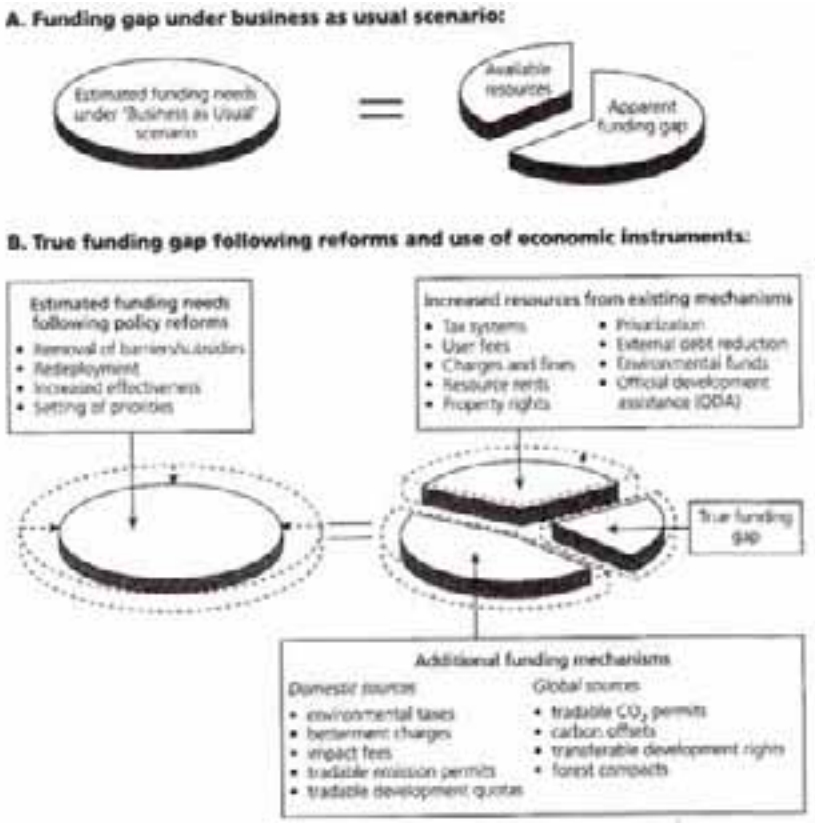
6.1.2 Supply Side Actions (Available Resources)

- Review existing financial resources (official budgets, committed donor funds, sub-regional assistance funds, etc.).
- Identify and quantify possibilities for increased financing from existing tax sources or charges related to the environment.
- Identify and quantify possibilities of forthcoming expenditure reductions in other sectors (and reductions in subsidies if they exist) to release funds that may be channelled to the environment.
- Identify and quantify possibilities for transferring funds from other programmes or from projects delayed or redesigned.

6.1.3 Development of Financing Gap Assessment

- Qualify and quantify a financing gap for a "baseline" investment programme on an annual basis for, say, a 2-year period.
- Estimate the demand for environmental funding over and above the "baseline" investments targeted to implement ICAM actions or related environmental actions which are essential to achieve valuable environmental results with associated high social and economic benefits that matter to public and private sector stakeholders.
- The new financing gap for the following 5-10 year will then assume credibility as an outcome of the application of a *financial strategy for the environment* which donor sources, regional or other programmes can consider "bankable" for support. Financial mobilization will be a more realistic process when a country demonstrates the commitment to develop capacity for operating a financial strategy.

Figure 1: Financing Needs and Sources for Sustainable Development



Source: *Theodore Panayotou, 1998, "Instruments for Change: Motivating and Financing Sustainable Development", Earthscan, London*

Environmental financial strategies emphasize strongly the distinctions between baseline and incremental financial scenarios because they allow demonstration of the type, extent and value of benefits accruing from lower or higher levels of investments and justification for increasing funding allocations for the environment:

- baseline financing scenario will achieve baseline benefits from *existing and committed financial resources*;
- incremental financing scenario will achieve incremental benefits from *increased financial resources*.

6.2 Mobilization of Financial Resources Through the Application of Market-Based Instruments

There are various market-based instruments that can be applied to promote environmental objectives which require flexibility and private sector cooperation. They are often packaged under categories intended to denote their primary target area.

The choice of instruments depends on the priority assigned to the combination of results or the primary result aimed at relative to the within the framework of the country's environmental policy. Unlike command and control regulations, instruments, when applied correctly, can:

- correct market distortions that cause environmental harm;
- raise revenue; and
- mobilize private resources to supplement inadequate budget allocations.

Ideally, all three policy aspects should be served by a combination of instruments. In practice, the instruments mostly used are those that may be enforced with existing legislation, such as charges and taxes, while policy reviews which take time to achieve are expected to be undertaken to create an enabling administrative context and capacity and legislation for those which seek to mobilize private financing for on-going investment on technology and new infrastructure development (non-compliance fees, deposit funds, performance bonds and liability payments.

Box 2. The Analyzed Economic Instruments

The economic instruments analyzed include (modified from Pearce & Howarth, 2000):

- Property rights allocation
- Fiscal instruments: emission and effluent taxes, input taxes (e.g. pesticide, fertilizer tax), product taxes, export/import taxes, differential taxation (e.g. leaded/unleaded gasoline), royalty (rent) taxation (e.g. forest taxation), land use taxes, accelerated depreciation (environmentally beneficial investments allowed to depreciate faster for tax offset purposes), subsidy removal (where subsidies harm the environment), subsidies (where subsidies benefit the environment).
- Environmental charges: user charges (e.g. entry fees, road pricing), betterment charges (charges on properties which benefit from public infrastructure or environmental improvement), impact charges (charges on properties for making the environment worse, usually levied with property and land use changes).
- Deposit-refund schemes and performance bonds: deposit-refund (tax subsidy) schemes (e.g. returnable bottles and cans), environmental performance bonds (mining. quarrying. forest logging etc), accident bonds (e.g. for oil spills).
- Liability systems : legal liability, non-compliance fines (charges for emissions above standards), joint and several liability (one contributor can be held responsible for all damage), liability insurance.
- Financial incentives: creation of funds for environmental improvements. These funds can come from government grants, specific taxes, debt- for-nature-swaps or international donors such as GEF.
- Tradable quotas and offsets: tradable water rights, tradable fishing quotas, tradable development rights (land is zoned, some of it for development and rights to that development then become tradable)

Source: UNEP/MAP/PAP, 2002, "Analysis of the Application of Economic Instruments for Combating Land Based Pollution in the Mediterranean Coastal Areas".

The experience in the Mediterranean shows that this channel of domestic resource mobilization is at present of limited importance. They are confined to revenue raising charges with emphasis on partial recovery of public sector investment costs without an overall vision for sustainable environmental finance mobilization aiming at a phased financial strategy to deal with the gross mismatch between financing needs and the supply of financial resources. A Report prepared by UNEP/MAP/PAP[5] under the SAP MED Programme for the GEF eligible countries reveals that:

> ***"...the most often used economic instruments are charges (70%) followed by subsidies (25%) and the deposit refund (5%). No market creation or financial enforcement incentives were reported. Compared to 1993, it can be concluded that no significant change in the number or structure of economic instruments used in environmental protection has occurred. As far as the charges are concerned, all countries reported the use of these instruments, mainly in the fields of transport, natural resources and water. Deposit refunds are in operation in only four countries: Egypt, Slovenia, Tunisia and Turkey".***

Another part of the same Report refers to the lack of linkage of the charges system to any environmental financial strategy.

> ***"Wastewaters, industrial and municipal, present the biggest issue in pollution of the Mediterranean Sea. It can be said that the use of economic instruments in this field in our region is not at a satisfactory level. On the other hand, because of the huge capital investment needed in this sector, the need for financing resources is extremely high. The Percentage of the population connected to sewage system was reported as low as in Albania 35%, in Bosnia and Hezegovina ranging from 91.4 to 1.9, in Egypt and in the area of Beirut 60%, in the rest of Lebanon 10%, 62% in Turkey, 74% in Morocco. The sewage user charges are the instruments reported by most countries. The revenues from these charges are aimed at the operation and maintenance of the sewage system and the wastewater treatment plants. These revenues should provide possibilities for investment in the sector, which happens very rarely. In Lebanon, there is no sewage charge. Moreover, currently, there are no economic instruments planned in this field. In Albania, no sewage water treatment exists. The revenues from user charges are collected in 3 towns only, while in 2000 sewage charges started to be introduced in 6 more cities. In Croatia, Egypt and Turkey the sewage user fees are liked within the same bill together with the water use charges. The water pollution charge in Morocco was introduced with the objective of financing actions and operations intended to reduce pollution of water. These charges are paid for all kinds of dumping, discharge, direct or indirect disposal into surface and ground water, etc. The Slovenian water pollution tax is the most advanced instrument reported in this field".***

Although economic instruments are used for achieving one of more of the classic objectives (*incentive objectives*, to correct failures in the market and encourage sustainable use of resources, *financial objectives*, to raise revenues for use in infrastructure projects, and *fiscal objectives*, to recover capital costs), rarely do economic instruments fall neatly into such separate categories.

As revealed by the existing literature on the Mediterranean and the EU, most countries impose user charges for water, sewerage, which aim mainly to recover investment costs rather than to change behaviour or create incentives. User charges have been easier to introduce due to the requirements imposed on the countries by the funding agencies (World Bank, European Investment Bank, etc.). The use of instruments for funding sustainable coastal development is limited.

[5] Analysis of the Application of Economic Instruments for Combating Land Based Pollution in the Mediterranean Coastal Areas, 2002.

6.3 Environmental Economics: An Outline of Rapid Training Workshop

First Mission	
Day 1	**Introduction to Environmental Economics (Why Environmental Economics)**
Morning session 09:30 – 13:00	Presentation of principles, methodologies, problems and examples
Afternoon Session 15:00 – 17:00	Discussion
Day 2	**Guidelines for application of Environmental Economics**
Morning session 9:30 – 13:00	Discussion Data requirements (generating a list of Data)
Afternoon session 15:00 – 17:00	Review of available data / data to be collected
Second Mission	
Day 3:	**Application of Environmental Economics**
Morning session 09:30 – 13:00	Developing the economic profile of the area Identifying and estimating the direct value of environmental resources Identifying and estimating the indirect value of environmental resources Qualifying the non-use value of environmental resources
Afternoon session 15:00 – 17:00	Pulling the first results together
Day 4	**Policy issues**
Morning session 09:30 – 13:00	Development/Environment options Working with spatial planners and other environmental specialists Reaching for the Minister(s) Use of Economic Instruments
Afternoon session 15:00 – 17:00	How to use Environmental Economics in policy making and knowing the limitations

Part II:
Guidelines
for the Pilot Application Case Study
in the Southern Larnaca Coastal Area

7. Guidelines for Data Requirements for Resource Valuation Analysis

7.1 Constructing an Economic Profile of the Coastal Area

The database should utilise as much as possible existing information sources, avoiding deep and costly research. Effort should concentrate on effective data management focused on data directly relevant to the needs of the particular Project. Important data include:

Population	The size, age composition, spatial concentration and recent growth trends (1982-2002/6)	Information available from the official Population Censuses, Department of Statistical Services and local community authorities
Summer housing accommodation	Number and location(s) of holiday houses in the area. In the area there is only one hotel, there are holiday houses owned mostly by Cypriots who use them, predominantly, during weekends and in the summer months. Little or no direct employment is associated with second homes, although some percentage of the growth of service employment (cafes, banks and restaurants), over and above the growth attributed to the size of the permanent village residents, may be considered to be "tourism-related".	Information available from the local community authorities and the CTO
Economic activities	Composition of economic activities (tourism hotel accommodation, if any, restaurants, commercial establishments – shops, construction, transport, agriculture, etc), the main locations of these activities and recent growth (1980-2000/6.	Information available from the official *Registration of Establishments* Reports and other sectoral Reports of the Department of Statistical Services. The location of activities (activity zones) should be marked on a map by field visit.
Agriculture	Areas of agricultural production, production levels by main crop and employment.	Information available from the official Agricultural Census Reports of the Department of Statistical Services and the Agricultural Support Payments Authority. Additional information should be obtained from the Larnaca District Department of Agriculture and by local field visits for particular details and more in-depth data.
Particular activities or establishments in the area of regional and national economic importance Desalination plant and the Larnaca International Airport	The International Airport has no particular connection with the coastal environment but nevertheless it is pat of the "production structure" of the area.	Information available from the relevant authorities themselves.
Particular Population Groups	Community groups (NGOs, fishermen, etc.) Investor groups (property developers active in the area) District level Chamber of Commerce and Industry District level development organisation(s)	Information from consultations with the local authorities, the District Administration, the Larnanca Chamber of Commerce and Industry, the Banks and the Federation of Ecological and Environmental Organisations.
Mapping of information	All the above data will provide the framework for the subsequent analysis as well as a basis for spatial mapping to show, among other things: ▪ the pressures on the coastal environment, ▪ the linkages and interactions between the coastal economy and the coastal environment and ▪ the environmental "hot spots", if any.	Information obtained from rapid field survey and the project environmental database, supplemented if necessary by field observation. Key information of the main environmental profile of the area should be utilised, such as water resources, quality of agricultural land, micro-climatic conditions, sensitive ecological areas, etc.

7.2 Getting Into Economic Analysis

7.2.1 Introduction

Environmental Economics studies can be undertaken at various levels of detail depending on specific purpose, direction and scope of the Case Study, its immediate analytical needs and the time and money resources available. As a rule, it is advisable to focus on "rapid appraisal" tailored to the specific issues and concerns of the Case Study. The following guidelines aim to spell out how a rapid environmental economics appraisal can be carried out, valid also to address wider analysis according to needs that may emerge from the basic conclusions concerning the area's coastal economic structure and its interactions with the coastal environment. (Please consult the examples in the Annex)

The main purpose of the Case Study is to:

- 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;
- develop a framework for highlighting the economic losses that may be incurred through coastal degradation and, by corollary, the benefits of coastal resource management; and
- derive fundamental policy conclusions concerning the justification of limits to development and increase in environmental investment on the basis of environmental economics focused on the benefits of conservation and management.

This basic Environmental Economics approach is currently missing in Cyprus allowing spatial planning and development decisions to rely on regulation enforcement and awareness raising efforts. Decision making will certainly be improved if a coherent Environmental Economics approach is used to provide information and analytical support for bringing into focus the value of coastal resources for a balanced consideration of development and conservation options taking into account not only the obvious benefits of development but equally the benefits of resource conservation /management.

7.2.2 Analysis

Analysis will follow three main stages roughly corresponding to three layers of environmental benefits/ values present in the Case Study Area: *The direct benefits, the indirect benefits and the existence benefits.*

Direct benefits: Assessment of the type, extent and value of the direct benefits require first an overall assessment of the economy of the area and its "GDP"

The gross production of the area should involve all the main production sectors in the area:

- holiday housing;
- agriculture;
- local trade;
- financial services;
- restaurants and cafes;
- public administration;
- desalination;
- airport (this activity may be omitted as its productivity is insensitive to the coastal environment).

Box 3. The problem of "partial information"

Private economic gains from coastal development are visible and enumerated in market prices (income, employment, etc.). By contrast, information on the environmental and social losses and costs incurred in coastal development is missing or hidden. This *partial information* leads to wrong land use and development choices (externalities) which ICZM, and indeed public policy in general, is committed to rectify. **Environmental economics provides the analytical and information support necessary for closing this "information gap" by bringing into focus prices, costs and benefits for balanced choices on development and conservation.**

Indicatively, a simple tabulation may look like the following:

Table 5: Gross Estimated Production

Sectors	Gross estimated production in money terms (Cy Pounds or Euro)
Holiday housing	
Agriculture	
Local trade	
Financial services	
Restaurants/cafes	
Public administration	
Desalination	
Airport	
Total / Area "GDP"	

The approximate estimated production of the area should then be compared with production levels (sector by sector) in a selected inland area of similar size (taking into account other characteristics too) to establish the differential that may be attributed to the coastal environment. A large part of the difference surely can be considered as the "productivity of the coastal environment/location". This value should be put down as the direct benefit of he coastal environment. Note that all values derive from a market context.

The need to compare the economy of the Case Study area with an inland area economy is a necessity to derive important differences that may be attributed to the coastal environment (a kind of "with" and "without" comparison). It is suggested that this inland area may be the area of Kornos or Kalo Chorio, (or an alternative inland location) a nearby inland area where agriculture, second homes and other village-based activities exist exhibiting a different non-coastal profile.

Indirect benefits: The next task is to estimate the indirect environmental services to the economy, and here attention should be paid to the features of the ***landscape*** (agricultural land as landscape, the Lakes, the coastal strip, etc.) and identify their contribution to either economic activities or pure enjoyment. A case in point is the perhaps the possibility of the agricultural landscape adding value to the holiday houses, which value would not exist if instead of green pasture or pleasant Mediterranean rural landscape it was a scrap yard of a landfill site.

Indirect benefits may also include the stabilisation function of the Lakes and any other ecological effect.

Existence benefits: The next task is to identify measure and value the existence value benefits of the main environmental features through field interviews. In the area there are important coastal resources (the western open coastal stretch, the Salt Lakes, the Sultan Pasha Umm Harem Mosque) which provide "hidden" enjoyment services whose social value present a major challenge and have to be considered.

7.3 Codifying Preliminary Results

Table 6: Preliminary Results

Benefits	Type	Extent	Estimated Value
Direct benefits			
Indirect benefits			
Existence benefits			

7.4 A Framework of Where the Analysis is Heading

Often, the burden of data collection involves work which may lose sight of the how it will be used in the Case Study. The following table helps to maintain a perspective on the development of the Case Study. (Useful examples and cases can be found in the Annex).

Work Tasks	Phase and Work Plan
1: A focused survey activity of the locations and extent of economic activities Data collection and analysis	**Coastal Area Profile** Outputs: ▪ Indicators & mapping of distribution of economic sectors (tourism, agriculture, construction, trade, etc.), impacts on the coastal environment. ▪ Conclusions about the geographical focus of existing resource use conflicts, constraints and possible development opportunities.
2: A rapid valuation of coastal resources Data collection and analysis	**Economic/environmental interactions** Outputs: ▪ Preliminary conclusions on the social value and role of coastal resources for sustainable development and conservation priorities. ▪ Estimates in monetary terms of the main values of coastal resources in alternative uses and policy conclusions.
3: Formulation of development/conservation options and Proposal(s) Review of impacts and contributions of economic activities (task 1) and the value of coastal resources (task 2)	**Integrated Coastal Area Strategy proposals** Outputs: ▪ Alternative development options. ▪ Economic justification of detailed plan proposals and outline investment priorities and opportunities for the use of economic instruments in the policy framework.

7.5 Shaping up the Case Study

Moving from data collection and analysis towards usable information requires a framework to guide work within a planning context. This framework should include the following:

Issues and Tasks	Information Outputs on
Analysis of the locations of economic activities	▪ Socio-economic structure of Project Area ▪ Extent of actual or potential threats to the coastal resources (conflicts, constraints, opportunities)
Analysis of the dependence of economic activities on the quality of coastal resources	▪ Extent of present and future social and economic significance (or value) of coastal resources ▪ Possible future development-conservation strategic options ▪ Basis for defining objectives for Integrated Coastal Area Sustainable Management Strategy ▪ Basis for short-listing possible policy measures/instruments for sustainable coastal development
Definition of future changes that need to be introduced to the uses of coastal resources	▪ Context for socio-economic justification for selected plan/policy actions ▪ Scope for streamlining environmental priorities in development policies and budget allocations

7.6 Suggested Contents of the Case Study Report

1. Brief description of the Area – The Environmental Profile
2. Choice of the Area
3. The Economy of the Area
4. The Coastal Environment – Key environmental features and main resources
5. Why an Environmental Economics Study – Its purpose
6. The Value of environmental resources
   - 6.1. Direct
   - 6.2. Indirect
   - 6.3. Non-use value
7. Management and Policy issues
8. What does it reveal about conservation
9. Instruments
10. Wider policy conclusions and recommendations

8. Economic Instruments

In most Mediterranean countries, including Cyprus, **urbanization** and **tourism development** pose the greatest threat to sustainable development. In this area of environmental concerns two particular instruments are of major practical importance, both central to the crucial issue of the financing gap that besets environmental management:

- Instruments that aim to raise revenue from beneficiary properties/owners resulting from changes in land use zoning from lower use (agriculture) to higher use (housing and tourism). Most popular instruments are: property taxes, betterment taxes / levies and capital gain taxes.
- Instruments that aim to reduce the burden of compensation for loss of development rights when there is need to protect environmental assets and/or preserve open space for the public. Such instruments come under the popular name of transferable development rights.

The Case Study will examine the scope of these two main groups of Economic Instruments and for this purpose a wider framework will be established identifying the existing instruments used in spatial planning and the gap that exists justifying incorporation of these new instruments for coastal management.

A table of the existing and missing instruments is presented below as a start.

Table 7: Development Instruments Used in Cyprus – A Partial Menu

Instruments	Main Target/Impact
General application instruments	
Land use planning	Control of development
Property taxation	Revenue raising
Immovable property tax	
Capital gains tax	
Transfer tax	
Specific application instruments	
Direct planning interventions	Creating/Influencing local level development
Land acquisition by agreement	Land acquisition for infrastructure and service development
Land exchange	
Compulsory land acquisition	
Land take (conditions on planning permission)	
Land use zoning	Regulating local level development
Specific building regulations (development conditions)	
User charges – fees (other than consumption charges)	Partial or full cost recovery revenues
(Charges on water, sewerage, road improvement, parking place provision, pavement construction, planning / permission, building license, etc.)	
Other	Encouraging conservation of listed building
Building conservation grants	Reducing/avoiding compensation costs
Transfer of development rights from listed buildings	

Table 8: Development Instruments Which do Not Exist in Cyprus

Instruments	Main purpose / target
Specific application instruments	
Taxation	
Land value increase taxation (betterment tax)	Land value recapture due to planning decisions
Vacant urban land in Local Plan Areas	Stimulating development of empty land in development locations
Non-tax instruments	Conservation of environmentally sensitive/valuable areas and/or provision of open space areas for recreation or education
Transfer of development rights from environmentally sensitive/valuable areas	
Charges/Fees/Levies	Revenue raising to financing infrastructure and social services to serve new development
Impact/Infrastructure fees	
Betterment charge/Levy	

9. A Note on Environmental Finance

A commonly perceived obstacle to ICZM implementation, in Cyprus and elsewhere, is finance. Increasing the awareness of Ministers and economic planners of the need to increase environmental investment is a major step forward, but the question will still remains how to finance the required investment when such a need arises. Many countries in the Mediterranean, if not all, face strict budgetary restrictions and Finance Ministries often straggle to finance the most crucial projects with higher perceived social and economic importance, e.g. to increase employment, secure macro-economic stability, reducing poverty, etc.

Typically, environmental action strategies including CAMPs, present lists of investment needs corresponding to desired solutions to environmental problems amounting to many millions (if not billions) of Euro. Compared with current and planned budget expenditure implementation costs reveal insurmountable financing gaps. *Financing gaps* cannot on a long term basis be bridged by donor funds and international finance institutions. Failure to put in place a coherent demand-driven *financial strategy* to translate financial needs into real demand for finance is of crucial importance to environmental management.

9.1 Need For a Financial Strategy Linked to Economic Instruments

The development of capacities for preparing and implementing financial strategies is the bridge from plans across to realization of the plans. Financial strategy means matching investment demand with available financing resources. There is often an imbalance. The response to this imbalance is often wrong typically including two features:

- assuming that the financing needs are constant and cannot be changed;
- adopting a “supply-driven” effort to ask for more funds (from where?) to increase the financial resources to implement all those actions proposed match them.

The core objective of the financing strategy is to close the financing gap by translate financing needs into manageable and feasible investment programme(s) corresponding to the phased actions to fulfil the most important environmental investment targets.

The financial strategy should be conceived as a two-pronged exercise: A demand side exercise of reducing “needs” down to the actual “demand” for funds, and a supply side exercise of increasing/mobilizing resources through the use of Economic Instruments.

Two important ICAM implementation results will be achieved by using baseline and incremental financing scenarios:

- stress the need to develop and apply a financing strategy in ICAM;
- draw needed attention to “marginal analysis” to show how much more investment will be needed to achieve higher environmental standards and higher benefits, or, the maximum benefits to be achieved with a given level of investment;
- help answer questions of how to target the use of limited funds to actions with the highest benefit per unit of cost.

Annex

A1 Economics of Preserving Open Coastal Area

The issue: Implementing government policy to maintain 100 ha of coastal land as open coastal space within the framework of Integrated Coastal Area Management

Area Database

Present land use: Limited accessibility and limited existing development rights

Alternative land use: Tourism hotel development.

Economic options associated with policy implementation

- ***Option 1:*** Compensation for compulsory acquisition of 100 ha on the basis of current market values
- ***Option 2:*** Transfer of development rights
- ***Option 3:*** Government setting up a Fund accruing to the area to finance the "opportunity cost" of conservation in terms of loss of income from tourism development.

Option 3: Loss of Development Income From 100 ha (Annotated Calculations)

1. Potential number of bed spaces = 3,700

- 100 ha allocated for low medium density tourism development at 20% plot ratio
- Net development land 65 ha (35% taken for roads and other infrastructure)
- 65 ha = 650,000 m^2 X 20% plot ratio = 130,000 m^2 floor area / 35m^2 per bed space

2. Estimated annual tourism development revenue from operation= 116.0 M Euro

- 3,700 beds X 70% average annual occupancy = 777,000 bed nights
- Total estimated annual revenue = 777,000 x 150 Euro
  (including non accommodation revenue spent in the local area)

3. Minus estimated annual costs of development

- Assuming 20% average amortization costs and 25% average running costs = 52.0 M Euro
- Income after amortization and running costs = 64.0 M Euro (Income includes wages, salaries and management profits).

4. Opportunity cost of conservation = 64.0 M Euro

- This raises two important environmental economics issues:
  a) Estimating and monetizing the value of social and economic benefits of conservation;
  b) Financing the opportunity cost of conservation.
- For (b) three possible sources may be investigated:
  b1. Assessing the Willingness to Pay by the local/national population to enjoy open space
  b2. Charging the national and foreign visitor population
  b3. Charging the hotel owners of the nearest tourism development zone for the added value of securing open space and less competition to existing development.

A2 Comparing and Evaluating Presently Open Coastal Area "Futures"

The issue: Comparing market-driven and ICAM-managed development

The challenge of protecting/preserving coastal open space concerns the prospect of **potential land use change** of an environmentally valuable coastal area now undeveloped due to economic and/or political pressure for development. Therefore, the area can be perceived to have **two likely "futures**":

- market-driven development; and
- ICZM-managed development.

Open coastal area – Most likely present situation Limited or no building development (probably some illegal buildings) No roads or other infrastructure Land uses: Agriculture, forestry, fisheries Recreation use by "special interest" visitors Good quality surface and ground water Negligible or no liquid and solid wastes Attractive natural scenery, probably habitat for various species,	
Two Futures	
Market-Driven Development (maximization of economic potential)	**ICZM-Managed Development** (development / environment integration)
▪ Rapid tourism and housing development without or in advance of proper road or other infrastructure ▪ Variable building development densities ▪ Profit-based development ▪ Rising property values and speculation ▪ Mixed and conflicting land uses ▪ Increase in liquid and solid waste loads ▪ Uncertainty about the future of the area and "who is doing what" ▪ Lack of spatial and policy context for public investment planning ▪ Likely environmental degradation ▪ Loss of natural quality ▪ Declining land values and tourism revenues in the medium and longer term	▪ Framework for building development and infrastructure (agreed development objectives) ▪ Building controls ▪ Profitable development allowed but subject to limits (sustainable development) ▪ Liquid and solid waste management ▪ Shared views about the future of the area ▪ Framework for public and private investment ▪ Protection of environmental assets ▪ Creation of market demand for quality and natural beauty ▪ Rising property values and tourism over time
Cost-Benefit Analysis of the two futures will highlight the benefits of ICZM: Unlike considering only the private benefits from land use change, comparing the costs and benefits of both options / futures will inform policy, decision making and investment planning to secure social, economic and environmental sustainability.	

A3 Environmental Economics Approach to Coastal Erosion

The issue: Identifying and evaluating the socio-economic impacts of erosion

Coastal erosion is a typical problem in most, if not all, countries. Erosion, apart from its technical problems, puts at risk human life, houses, agricultural land and beach quality. Let us suppose that ICAM proposes investing in a coastal defence wall which will cost USD 0.5 million. The level of cost may seem high for a poor country and may be turned down. If the benefits are taken into account simple environmental economics can generate important information which will surely mobilize political opinion and local community support for the investment.

	Protection costs (USD)	People at risk	Houses at risk	Agricultural land at risk	Beach area at risk
Existing situation without Project	-	5,000	100	50 ha	10 ha
Future with the Project	500,000	1,000	20	10	2 ha
Incremental costs	500,000				
Benefits		4,000	80	40 ha	8 ha
Value of benefits (USD) (Benefits are damages avoided)		Not quantified	80 x 10,000 repair costs avoided = 0.8 M	40 ha x 50,000 income loss avoided = 2.0 M	5,000 people using the beach willing to pay 50 per year to avoid beach degradation = 0.250
Total value of benefits excluding human health risks					3.05 M
Ratio of annual benefits to investment cost					6.1

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Part III:
Environmental Economics
Pilot Application
Case Study:
Southern Larnaca Coastal Area

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 Mediterranean[6]. 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:

- 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
- The *Environmental Economics Guidelines* Document circulated to and discussed with the Activity Team in June 2007.

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.

[6] 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).

10 Brief Description of the Area – The Environmental Profile

10.1 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 extend 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:

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.

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 1,500 ha of animal crops.
- Short distance (less than 15 km) 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.

11. 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 **Map 1**).

Map 1: Pilot Application Case Study Area

11.1 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 Larnnca 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.

12. Spatial Planning Zoning Regulation in the Case Study Area

12.1 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 9: 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 ratio (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.

12.2 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.

12.3 Pressure on the Coast – Population and Housing Density

Table 10: 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

** Population estimate: 2,050 coastal holiday houses x 4 persons per house = 8,200 summer population plus 6,140 village resident population.*
Source: *CAMP Cyprus Project Research (LP Area = Local Plan Area)*

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 11: 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	1,055	144	1,569	120.6
2006	1,557	213	2,047	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 12: 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	2.50%
Hill Resorts	2,121	2.40%
Total	**95,572**	**100.00%**

Source: Cyprus Tourism Organisation

12.4 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 13 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 13: 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**	**21.40%**
Total population	**512,000**	**602,000**	**689,500**	**34.60%**

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.

13. The Economic Profile of the Area

13.1 Executive Summary of the Economic Profile

13.1.1 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:

- resources are made fairly and equally available to the wider public thereby maximising social welfare;
- sustainable use of resources is safeguarded during the process for development;
- the competitive advantage offered by coastal resources that guides economic growth is maintained in the long run.

13.1.2 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, extend 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.

13.1.3 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 14: 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 km and a tourist zone of 5 km^2. 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 lead 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 loosing 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.

13.2 The Urbanisation Process

13.2.1 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 15 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.

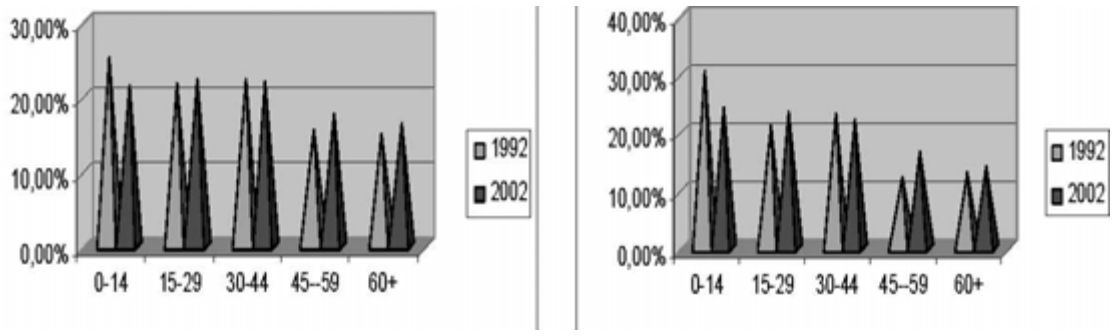
Table 15: Percentage Change in Key Population Indicators 1982-2002

	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.

Figure 2: Age Distribution Comparison 1992-2002



All Cyprus **Pilot Area**

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.

13.2.2 Housing

Table 16 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).

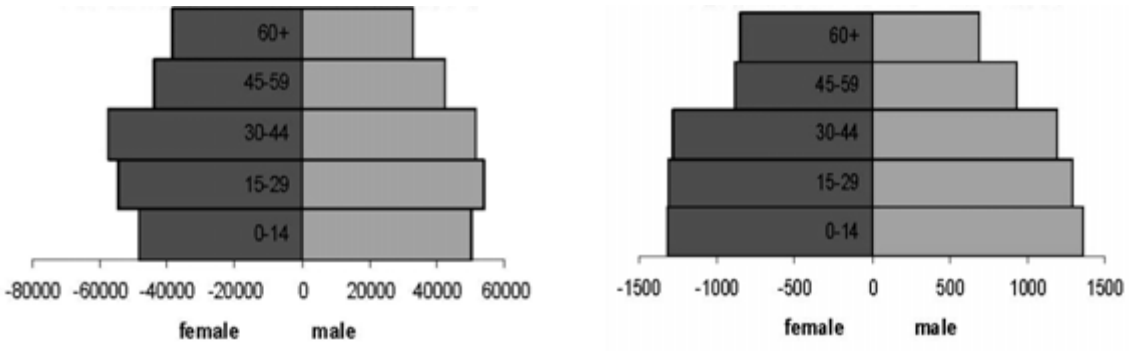
Table 16: Housing Comparisons 2002/2006

	2006 estimated figures					2002 statistical figures			
	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	1,800	15%	1,800	0	0%	1,563	1.462	10	1%
Meneou	890	28%	430	460	52%	696	348	323	46%
Kiti	1,800	62%	1,665	135	8%	1,113	947	105	9%
Perivolia	2,726	50%	1,169	1,557	57%	1,819	568	1,055	58%
Total for Pilot Area	**7,216**	**39%**	**5,064**	**2,152**	**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 15).

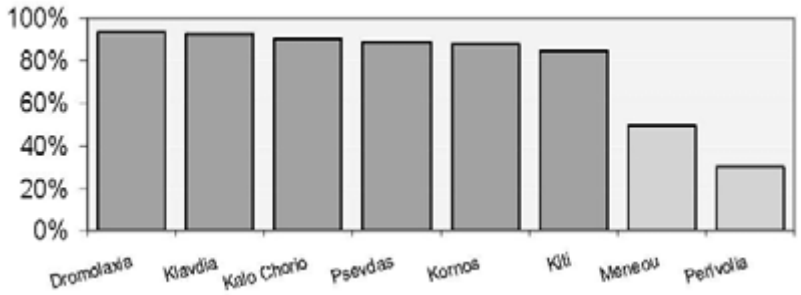
Figure 3: Population Pyramid



Cyprus Urban **Pilot Area**

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.

Figure 4: Houses of Usual residence (as a % of Total)



Source: *Population Census 2002*

13.2.3 Land Use Patterns

Table 17 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.

Table 17: 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	

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 1.20 km of which around 300 m 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 km with a patchy tourist development along the coast. Kiti-Softades has around 3.5 km 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.

13.2.4 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 Figure 5 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,

- that the supply for coastal land decreases while at the same time demand for acquiring coastal real estate increases;
- 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.

13.2.5 Employment

Using statistical data from the 2005 Registration of Employment (published by the Statistical Service), Table 18 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 extend the above conclusion. A further comparison of the total number of people employed between tables 18, 19 and 20 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%.

Figure 5: Real estate Values

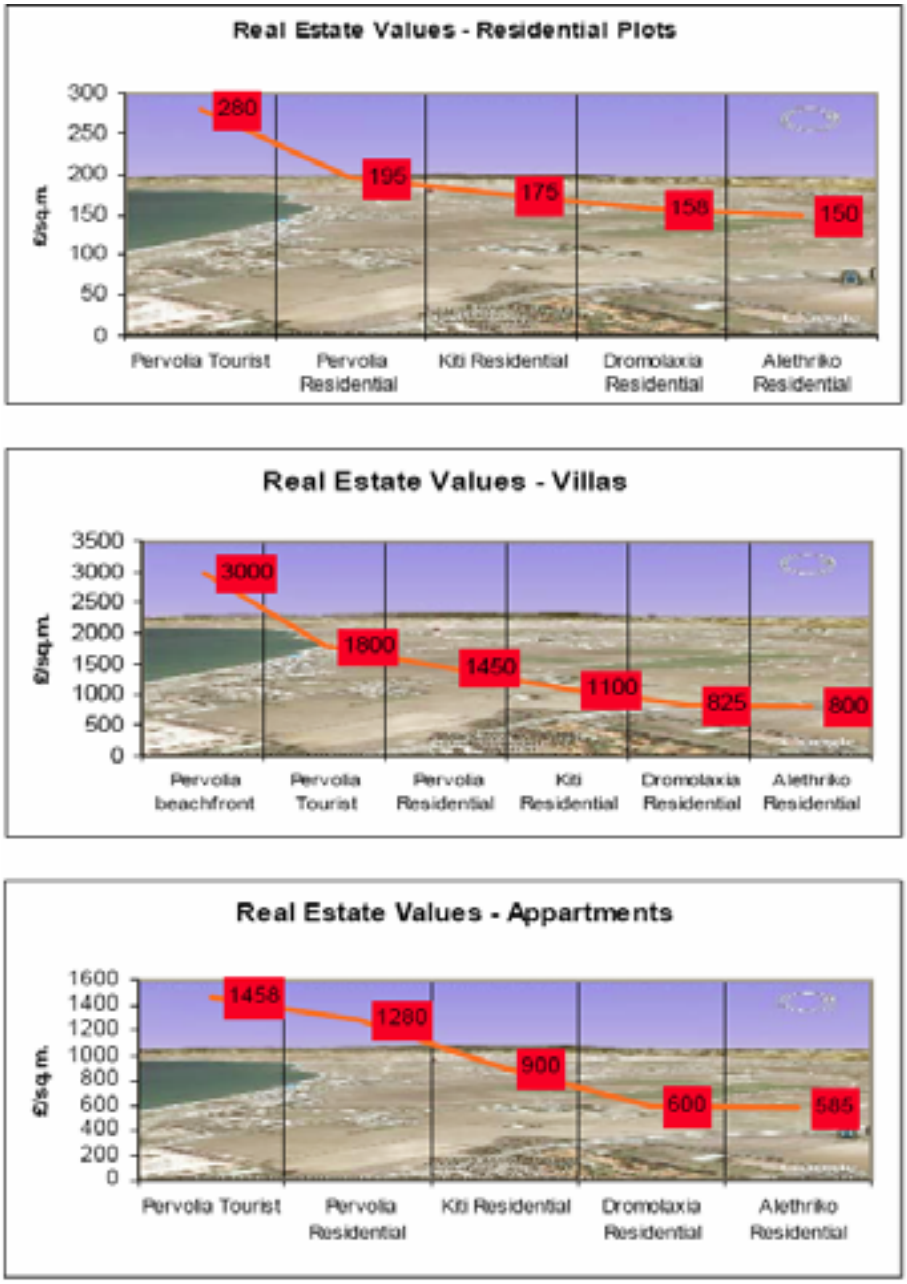


Table 18: Commuting Rate Estimation

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 19 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 19: Employment by Economic Activity

District	Employment		Economic Sector		
	Total econom. Active population	Unemployment rate	Primary sector	Secondary sector	Tertiary Sector
Cyprus Larnaca	303,198	3.45%	3.59%	23.23%	72.80%
	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%
Perivolia	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 20 below reveals that the construction and real estate sectors are the leading employers in the Area giving work to around 1/4 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.

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.

Table 20: 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*

13.3 Agriculture & Farming in the Pilot Area

13.3.1 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 21). 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 21: 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 extend 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.

12.3.2 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 22: 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	2,947	77%		2,554	18%	393	3%
Artichokes	887		30.10%				
Leafy and other veg.	840		28.50%				
Potatoes	892		30.27%				
Animal Crops	3,628	14%		1,702	12%	1926	16%
Hay	588		16.21%				
Wheat for hay	678		18.69%				
Siphon	1,781		49.09%				
Grains	16,893	66%		7,758	56%	9135	77%
Wheat	2,166		12.82%				
Barley	14,721		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%
	25,790			13,858	5	11,931.5	

Source: *Cyprus Agricultural Payments Organization*

Table 22 figures show a much smaller total agricultural acreage compared to the 2003 Census statistics – Table 21. This is attributed to two important parameters that need be mentioned,

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

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.

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.

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.

Table 23: Percentage of Cereal and Fodder Crops

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

Source: *Census of Agriculture 2003, Statistical Service*

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 looses 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:

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

13.3.3 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 24: Agricultural Land Use in Selected Communities

	Major agricultural uses						
	Total area (decares)	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 25: 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*

13.3.4 The Key Value Crops

Annex 3 is an extended approach to the Area's agricultural profile (Table 22) 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 €7.0mln, accounting for 6-7% of the area's GDP. Farming (dairy cows and sheep/goat) contributes another €6.0 to €7.0mln raising the total GDP from all primary sector activities to around €11-€14mln. 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 loosing 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.

13.3.5 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 26: Employment in agriculture 2003

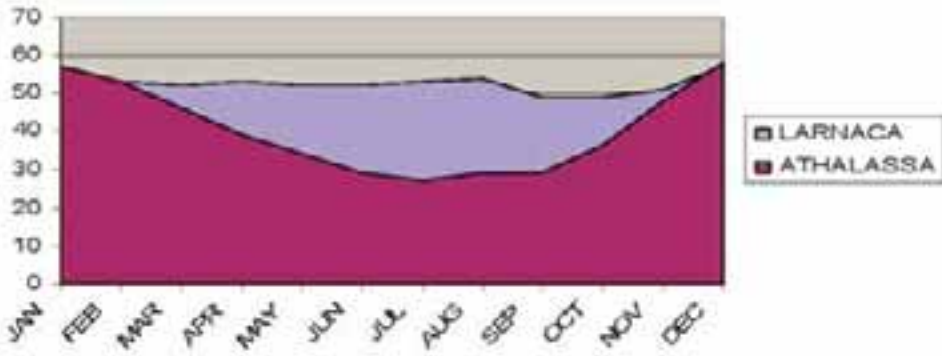
	No. of owners and members of household	No of labour permanent & temporary	Age of owner / % of total holdings		
			Up to 44	45-64	65+
Cyprus	80,122	123,456	24%	53%	23%
Nicosia	28,148	24,142	21%	55%	23%
Larnaca	12,382	10,703	26%	53%	21%
Dromolaxia	354	178	30%	45%	25%
Meneou	76	140	29%	38%	32%
Kiti	377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

Source: *Census of Agriculture 2003, Department of Statistics*

13.3.6 Environmental Factors Favouring Agricultural Production

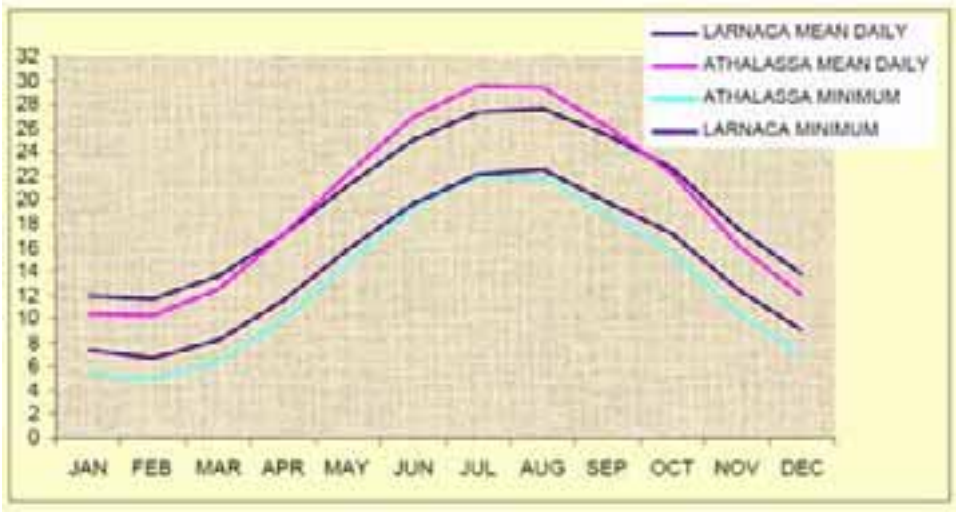
Mild climate: Due to its coastal location, the area experiences a more even distribution of temperature diurnally and seasonally compared to inland regions, therefore favouring the production of a range of crops throughout the year. Winter frost is minimal and summer extreme hot conditions are rare, 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.

Figure 6: Mean RH at 13.00 hrs 1991-2000



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

Figure 7: Mean Temperature 1991-2000



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

Box 4. 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 4-6 c 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.

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 8 km therefore providing farmers with a cost efficient cultivation land to work with and a wide open area o 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 extend 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.

Fertile land: Our field work and interviews suggested that land fertility is to some extend inversely related to the distance from the coast as we move inland along a 25 km radius. Areas between Dromolaxia and Kornos are characterised by a low land fertility an observation which is to a great extend 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.

13.4 The Tourism Sector

13.4.1 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 8.5 km 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.

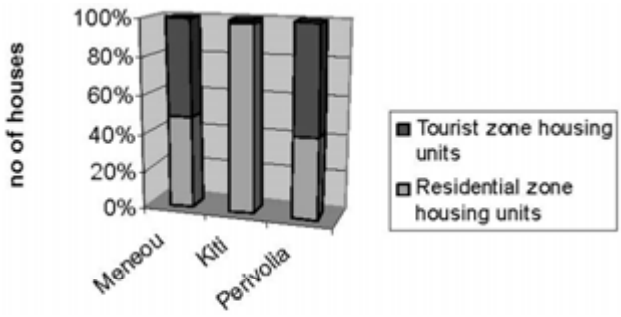
Table 27: Vacation Housing in the 3CPA

	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**	**1,695**	30
Perivolia	315	12	983	571	1,819	1,055	2,726	1,557
Total for 3CPA	**1,080**	**62**	**2,241**	**827**	**3,628**	**1,569**	**5,311**	**2,047**
Secondary/ total		5.74%		36.90%		43.25%		38.54%

** Figures are based on community council data and are segmented by residential and tourist zone*
***Source:** Population Census 1982, 1992, 2002.*

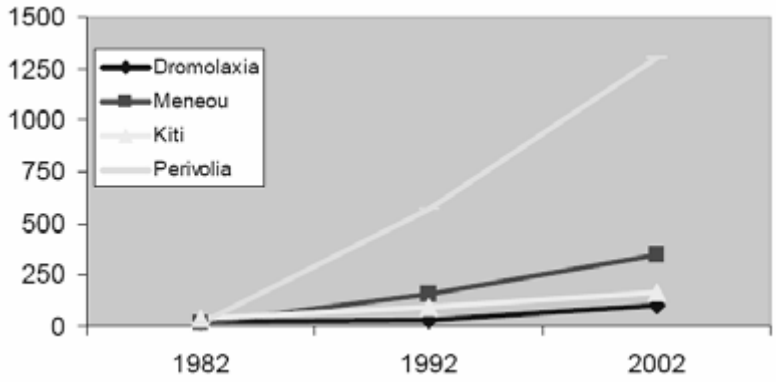
The figure below illustrates a comparison between housing units in the residential and tourist zones for 2006. Given the fact that nearly all housing units in the tourist zone are vacation houses we may conclude that 50-60% of all housing units at Meneou and Pervolia belong to non-permanent – vacation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

Figure 8: Primary and Secondary Housing Units 2006



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.

Figure 9: Number of Vacation (Tourist) Houses 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 km^2 and a beachfront of 3.5 km 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 km of which 3 km 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:

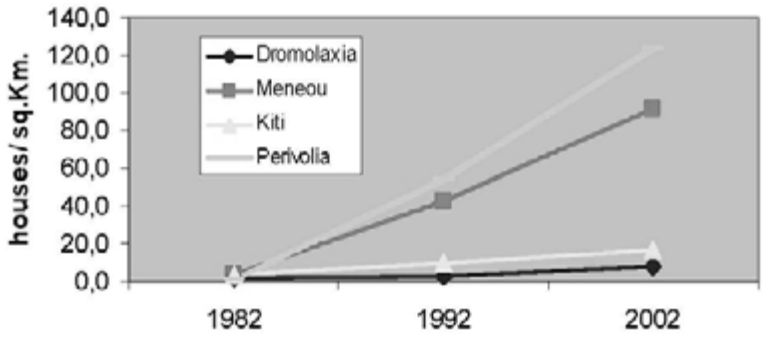
- that development has already reached a limiting point at Meneou tourist zone and the only undeveloped beach front falls outside the Meneou boundaries, towards the Larnaca airport.
- that development potential exists at Pervolia tourist zone but high land values act as a barrier to development as they 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;
- 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.

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.

13.4.2 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 in Annex A1 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 m^2 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.

Figure 10: Vacation Houses Per km^2 of Community's Total Area



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.

13.4.3 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.

13.5 Construction and Real Estate

Current data from the 2005 Registration of Establishments (see Table 20) 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:

- 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;
- 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.

Table 28: Employment in Construction and Real Estate

	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:

- land available for real estate trading and construction becomes all the more scarce as development advances;
- 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;
- 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.

13.6 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. 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:

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

Table 29: Employment in Manufacturing

	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**

13.7 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 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.

Table 30: Employment in Wholesale and Retail Trade

	Wholesale and Retail Trade		
	No of people	No of establishments	Employees/ establishment
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**

13.8 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 £1.6 mln of which 20-25% relates to salaries and wages expenses.

Table 31: Employment in Public Administration, Education and Health

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

13.9 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.

Table 32: Employment in Some Other Economic Activities

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

Table 33: 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

14 Why an Environmental Economics Study – Its Purpose And Basic Principles

14.1 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 5. 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.

15. The Value of Environmental Resources in the Case Study Area

15.1 Valuation Methodology and Approach

15.1.1 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 in the Table 34.

Table 34: 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.

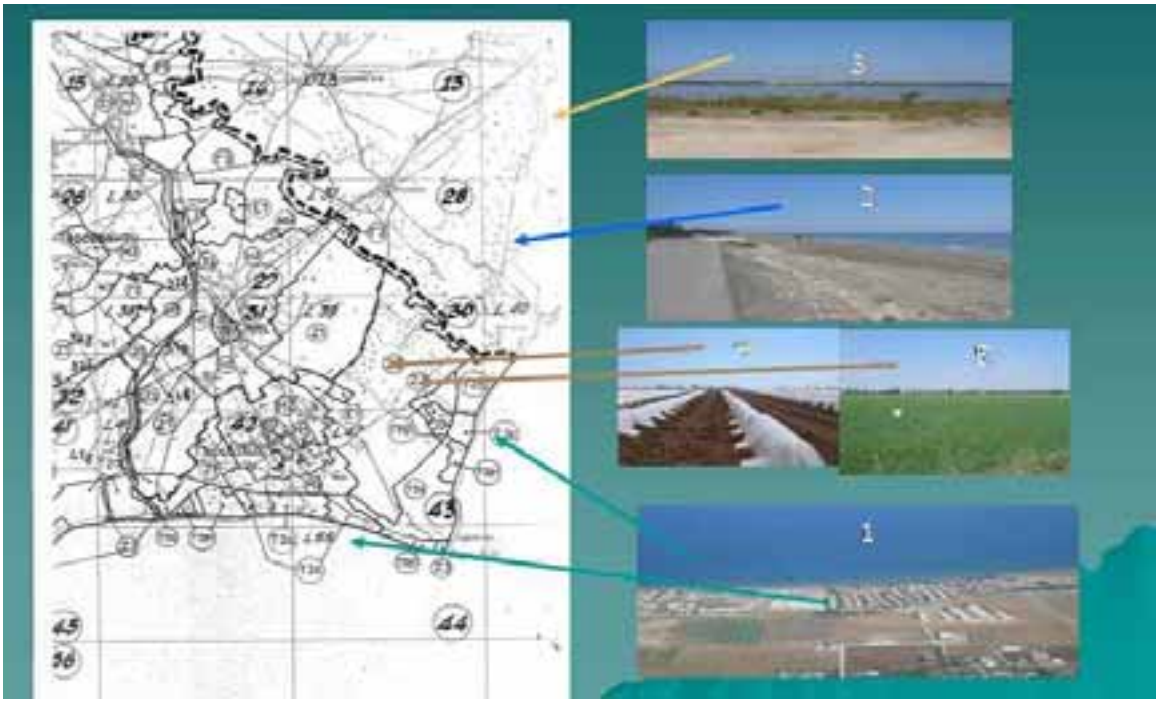
15.1.2 Valuation Framework and Results

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.

Map 2: Coastal Resources / Assets of Value



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 35: Locations and Type of Local Environmental Assets

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

15.1.3 Identification of Benefits and Their Extent[7]

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

[7] all values in Pounds, 1 Pound = 1.71 Euro

"*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.[8]

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%**.

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%).

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.

15.1.4 Market Price Indicators Used in Valuation

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.

[8] 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).

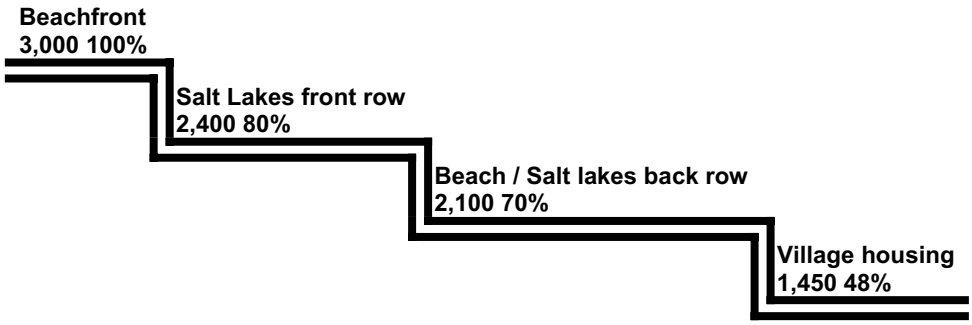
For the purposes of this Case Study, and to demonstrate how it can be done, the kind of results obtained and the significance of the information, a questionnaire Survey (***WTP***) was carried out focusing on the valuation of:

- 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.

Table 36: House Price Hierarchy (Prices Per Square Meter in Pounds)[9]



15.1.5 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 37: 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 in Table 38.

[9] 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.

Table 38: 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 that 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.[10] 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 39: Consolidated Results – The Benefits of the Coastal Environment

Type of Benefit	Sector	Estimated Value (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)
	Value of Local Economic Benefits	**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)
	Value of Local Social Benefits	**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**	

[10] See for the Mediterranean Gl. Constantinides 1993 and F. Juhasz 1993, and for wider reference D.W. Pearce 1998.

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 X 500 X 12 X 0.10 = 979,200.
7. 1,705 x 500 x 12 = 10,230,000 X 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.

15.2 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.[11]
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 they lead about the value of the coastal environment illuminating hidden (and often missing) aspects in development planning and

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

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 as 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.

15.3 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 the Box 6:

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

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 rabidly get scarce. A survey should be carried out to establish this.

Box 6. 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 X 240 days X 85% average annual occupancy X 75 Pounds X 0.33 = 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.

15.4 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 40: "Demand" for the Open Beach Area in the Case Study

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

If the above table 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 in the Table 41.

Table 41: 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 42: 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 breach areas	50	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	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 lower value per km of cost (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 43: 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**

16 Environmental Management and Policy Issues

16.1 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 13). 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 staring 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.
- Fourth, 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 creates environmental and indirect economic benefits to existing development owners/users. *Distributional issues*, overlooked in spatial planning decisions (zoning), have to be taken into account.

16.2 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.

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.

Table 44: Number of Establishments – The Five 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*

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.

16.3 Assessing Conservation Challenges

The planning system will most likely be under pressure to expend 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 45: 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.

17. 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 benefits 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.

18. 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 changes, 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.

19. 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.**

A1.1: GDP Valuation of the Agricultural Sector in the CAMP Pilot Area – High Estimate

					Output		Selling value		Direct support subsidies				
	Area ha	Area ha	% total	% total area	Yield t/ha	Output tons	€/ton	Value €	€/ha	Value €	Total GDP value	% total value	Dromolaxia GDP
Vegetables	**294.7**		**11.43%**			**7,463**		**€ 3,328,800**		**€ 28,684**	**€ 3,357,483**	**48.01%**	**€436,473**
Artichokes		88.7		3.44%	30	2,661	€513	€ 1,363,977	€110	€9,715		19.64%	
Leafy and other veg		84.0		3.26%	20	1,680	€598	€ 1,004,658	€110	€ 9,200		14.50%	
Potatoes		89.2		3.46%	35	3,122	€308	€960,166	€110	€ 9,769		13.87%	
Animal Crops	**362.8**		**14.07%**			**1,287**		**€ 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	**1,689.3**		**65.50%**			**3,819**		**€ 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		1,472.1		57.08%	2.3	3,386	€145	€ 491,728	€211	€310,380		11.47%	
Fruit	**79.7**		**3.09%**			**3,558**		**€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	1,992	€205	€408,424	€110	€ 3,636		5.89%	
Citrus		29.7		1.15%	40	1,188	€256	€ 304,473	€110	€ 3,253		4.40%	
Olive and nut trees	**71.4**		**2.77%**			**1,133**		**€ 967,752**		**€ 50,807**	**€ 1,018,559**	**14.57%**	**€254,640**
Olives		70.8		2.75%	16	1,133	€854	€ 967,752	€718	€ 50,807		14.57%	
Greenhouses	**6.1**	**6.1**	**0.24%**		**150**	**915**	**€683**	**€ 625,348**	**€110**	**€668**	**€ 626,016**	**8.95%**	**€87,642**
Set aside	**75.0**	**75.0**	**2.91%**		**0**	**0**		**€0**	**€110**	**€8,214**	**€ 8,214**	**0.12%**	**€1,889**
Total	**2,579**	**2,480.9**	**96.20%**			**18,174**		**€ 6,482,360**		**€ 510,778**	**€ 6,993,138**	**£6,993,138**	**€1,522,562**

A1.2: GDP Valuation of the Agricultural Sector in the CAMP Pilot Area – Low Estimate

					Output		Selling value		Direct support subsidies				
	Area ha	Area ha	% total	% total area	Yield t/ha	Output tons	€/ton	Value €	€/ha	Value €	Total GDP value	% total value	Dromolaxia GDP
Vegetables	**294.7**		**11.43%**			**4,301**		**€ 1,535,272**		**€ 28,684**	**€ 1,563,956**	**31.85%**	**€203,314**
Artichokes		88.7		3.44%	15	1,331	€400	€ 532,200	€110	€9,715		11.04%	
Leafy and other veg		84.0		3.26%	12	1,008	€450	€453,600	€110	€ 9,200		9.43%	
Potatoes		89.2		3.46%	22	1,962	€280	€ 549,472	€110	€ 9,769		11.39%	
Animal Crops	**362.8**		**14.07%**			**1,287**		**€ 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	**1,689.3**		**65.50%**			**3,819**		**€ 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		1,472.1		57.08%	2.3	3,386	€145	€ 491,728	€211	€310,380		16.34%	
Fruit	**79.7**		**3.09%**			**2,989**		**€ 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	1,328	€205	€ 272,283	€110	€ 3,636		5.62%	
Citrus		29.7		1.15%	45	1,337	€256	€ 342,532	€110	€ 3,253		7.04%	
Olive and nut trees	**71.4**		**2.77%**			**1,133**		**€ 792,960**		**€ 50,807**	**€ 843,767**	**17.18%**	**€210,942**
Olives		70.8		2.75%	16	1,133	€700	€ 792,960	€718	€ 50,807		17.18%	
Greenhouses	**6.1**	**6.1**	**0.24%**		**150**	**915**	**€683**	**€ 625,348**	**€110**	**€668**	**€ 626,016**	**12.75%**	**€87,642**
Set aside	**75.0**	**75.0**	**2.91%**		**0**	**0**		**€0**	**€110**	**€8,214**	**€ 8,214**	**0.17%**	**€1,889**
Total	**2,579**	**2,480.9**	**96.20%**			**14,443**		**€ 4,399,350**		**€ 510,778**	**€4,910,128**	**£4,910,128**	**€1,228,502**

A1.3:
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	1,376	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	1,455	0	740	8,449	10,644	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: 200 kg
- Average annual output dairy cows: 5,500 kg
- Price per ton sheep/goat milk: £350/ton
- Price per ton dairy milk: £240/ton

A1.4:
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	1,376	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	1,455	0	740	8,449	10,644	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**	

A1.5:
GDP Valuation of the Tourist Economy in the CAMP Pilot Area – 2006

Registered CTO tourist accomodation										Estimates	
										High	Low
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	£53	€ 107	€ 5.226.780	€ 2.613.390
Three Seas	Hotel	Pervolia	**	52		99	£49	€ 83	€ 1.577.569	€ 788.784
Eli	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 statistics						407			€ 7.113.300	€ 3.556.650

Housing units situated in tourist zones						
Secondary homes in tourist zone	No of accomodation units (houses)	Monthly imputed rent	Annual imputed rent	GDP 100% occupancy	GDP 50% occupancy
Pervolia	1557	862	€ 10.345	€ 16.106.897	€ 8.053.448
Mensou	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
Mensou	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 2:
Willingness to Pay (WTP) Survey Carried Out in the Pilot Area

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 *A2.1*, 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 in the Table 46.

Table 46: The Breakdown of Respondents

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 *A2.2*, 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 *A2.3*.

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:

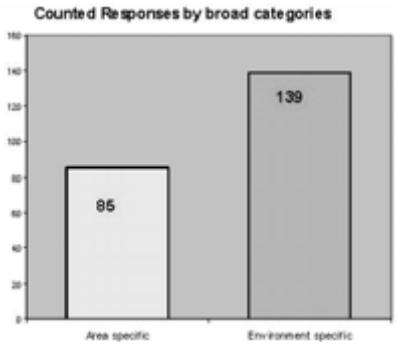
- The salt lakes;
- The open agricultural landscape;
- The coastal and beachfront areas;
- Sites of major historical and archaeological value.

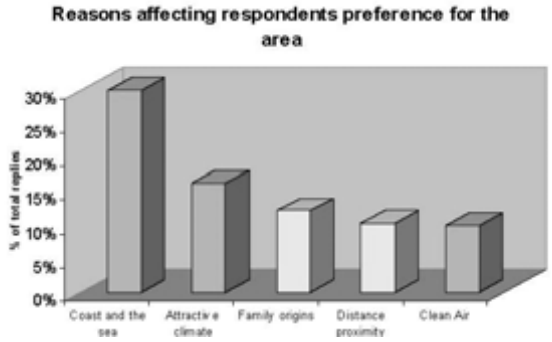
A2.2 is a summarised table reporting the average scores attained per person per category of respondent as identified in Section 1 and *A1.4* provides a set of distribution graphs showing for each question, the number of replies per selected option of monetary value.

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

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 sytem. 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):

Table 47: WTP for Maintaining the Salt Lakes as Natural Ecosystems

	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.

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.

Table 48: WTP for Maintaining an Agricultural Landscape Away From Development

	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, 2, 3, 4: As in Table 47

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.

WTP for Keeping Beachfront Areas in Their Natural State

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.

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.

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.

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 48.

Table 49: WTP for Keeping Beachfront Areas in Their Natural State

	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, 2, 3, 4: As in Table 47

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.

Table 50: WTP for Preventing Development on Land of High Archaeological Value

	Total number	Surveyed average WTP/ person	Total value
Permanent residents[1]	12,000	£16.48	£197,760
Vacation house owners[2]	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, 2, 3, 4: As in Table 47

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

- 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.
- 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.
- 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.

A2.1: Sample Questionnaire

ΑΡ. ΕΡΩΤΗΜΑΤΟΛΟΠΟΥ: .....

C.A.M.P. CYPRUS - QUESTIONAIRE

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-Κίτιου 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 shalll 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 questionare 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 citizent	
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		Εαν 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 archaelogical value		Το παραλιακό τοπίο / η καθαρή και κατάλληλη για κολύμπη 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 αλυκών	
other		άλλο	

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

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.

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

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.

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

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?

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

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.

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

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.

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

natural/ no man made interferance

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

natural with man made side park

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

with hotel development

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.

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

3.7 The beach below is polluted with the effluents of a nearby factory. As an Organization 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.

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

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?

remain as developed, as it is today	
be turned into a park with scenic facilities	
be turned into a recycled monument/ museum	
be given to tourist and housing development	

3.9 A sizable 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.

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

3.10 A coastal area alongside the Ilaros 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?

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

(a) maintaining the natural coast

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

(b) path/ cycle way beach

nothing	
up to €2	
up to €5	
up to €10	
up to €20	
up to €50	
over €50	

(c) tourist development by the coast

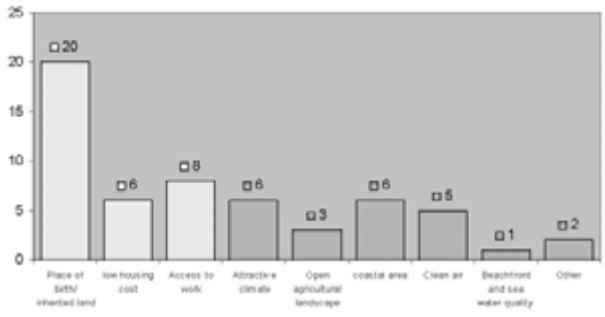
A2.2: Survey Results – Summarised Data Table

	Questions of the Survey		3.1	3.2	3.3	3.4	3.5			3.6
							A	B	C	
	Category		£	£	£	£	£	£	£	£
1	*Permanent*	Total money WTP	588.00	448.00	640.00	614.00	27.00	113.00	44.00	478.00
	Residents	WTP/ head	20.28	15.45	22.07	21.17	0.93	3.90	1.52	16.48
2	*Owner of*	Total money WTP	262.00	248.00	369.00	642.00	22.00	43.00	114.00	246.00
	tourist housing	WTP/ head	9.36	8.86	13.18	22.93	0.79	1.54	4.07	8.79
3/4	*Foreign Tourist*	Total money WTP	160.00	170.00	237.00	456.00	131.00	143.00	124.00	91.00
		WTP/ head	5.71	6.07	8.46	16.29	4.68	5.11	4.43	3.25
5	Cypriot daily	Total money WTP	338.00	218.00	353.00	436.00	39.00	92.00	103.00	426.00
	traveller	WTP/ head	12.07	7.79	12.61	15.57	1.39	3.29	3.68	15.21
	ALL SAMPLE	**Total money WTP**	**1348.00**	**1084.00**	**1599.00**	**2148.00**	**219.00**	**391.00**	**385.00**	**1241.00**
		WTP/ head	**£11.93**	**£9.59**	**£14.15**	**£19.01**	**£1.94**	**£3.46**	**£3.41**	**£10.98**

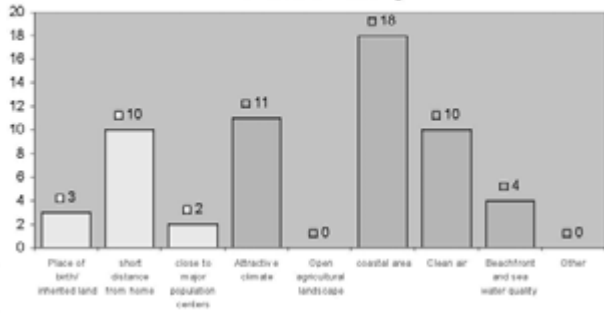
	Questions of the Survey		3.7	3.8				3.9	3.10		
				A	B	C	D		A	B	C
	Category		£	£	£	£	£	£	£	£	£
1	*Permanent*	Total money WTP	486.00	170.00	190.00	186.00	48.00	417.00	384.00	357.00	128.00
	Residents	WTP/ head	16.76	5.86	6.55	6.41	1.66	14.38	13.24	12.31	4.41
2	*Owner of*	Total money WTP	629.00	216.00	199.00	189.00	96.00	265.00	295.00	349.00	206.00
	tourist housing	WTP/ head	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	463.00	183.00	200.00	176.00	127.00	156.00	278.00	356.00	153.00
		WTP/ head	16.54	6.54	7.14	6.29	4.54	5.57	9.93	12.71	5.46
5	Cypriot daily	Total money WTP	428.00	147.00	148.00	162.00	96.00	289.00	234.00	289.00	99.00
	traveller	WTP/ head	15.29	5.25	5.29	5.79	3.43	10.32	8.36	10.32	3.54
	ALL SAMPLE	**Total money WTP**	**2006.00**	**716.00**	**737.00**	**713.00**	**367.00**	**1127.00**	**1191.00**	**1351.00**	**586.00**
		WTP/ head	**£17.75**	**£6.34**	**£6.52**	**£6.31**	**£3.25**	**£9.97**	**£10.54**	**£11.96**	**£5.19**

A2.3: Survey, Section 2 Distribution Graphs

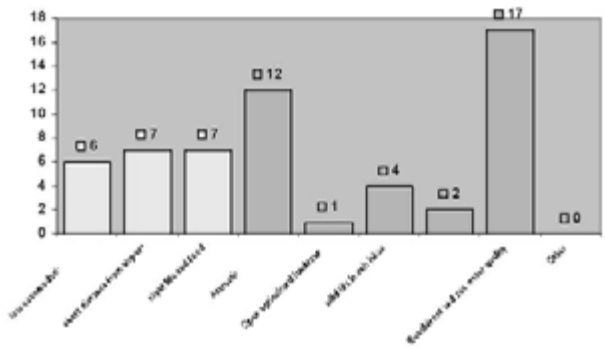
Graph 1: Counted responses from Permanent Residents



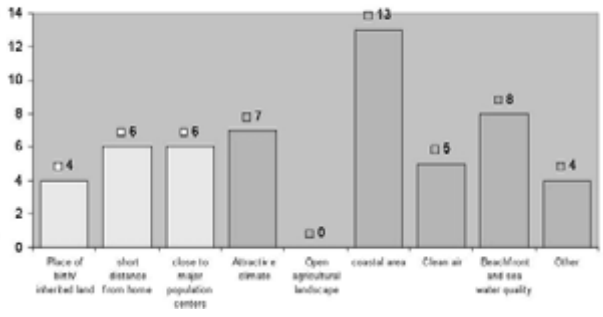
Graph 2: Counted Responses from Owners of vacation housing



Graph 3: Counted Responses from Foreign visitors/ tourists

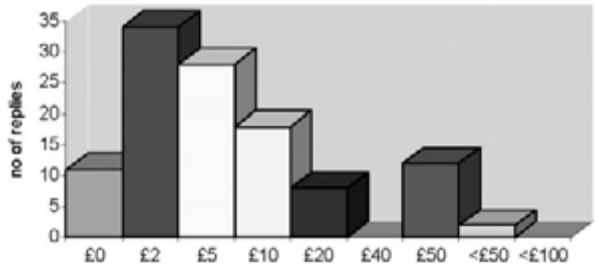


Graph 4: Counted Responses from Cypriot daily visitors

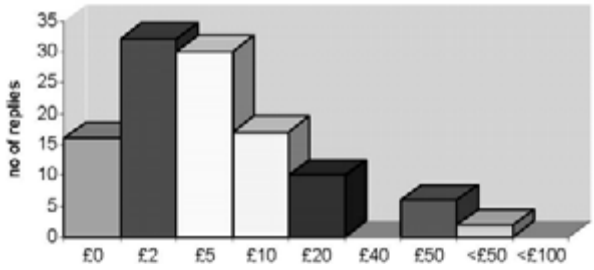


A2.4: Distribution Graphs

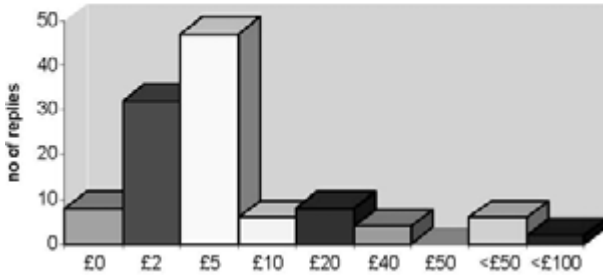
Question 3.1



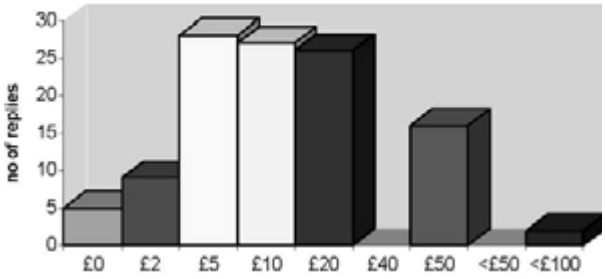
Question 3.2



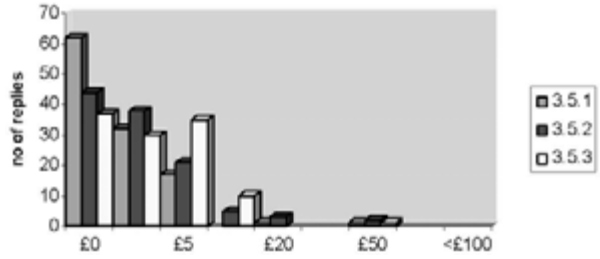
Question 3.3



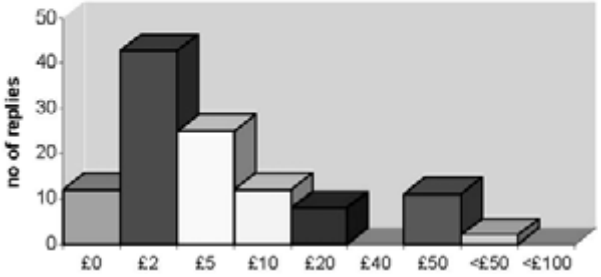
Question 3.4



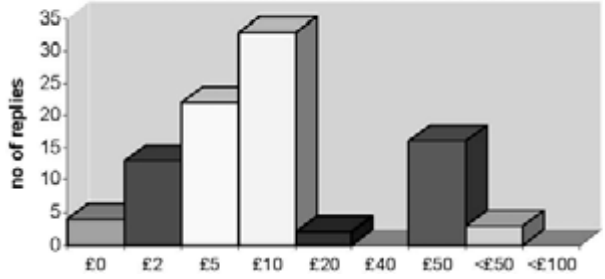
Question 3.5



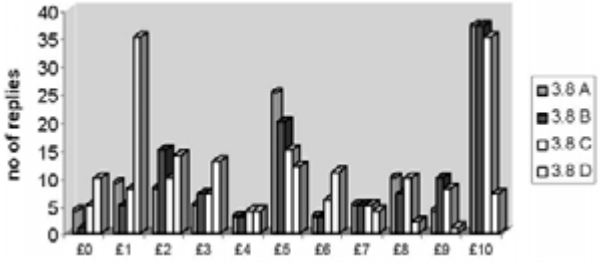
Question 3.6



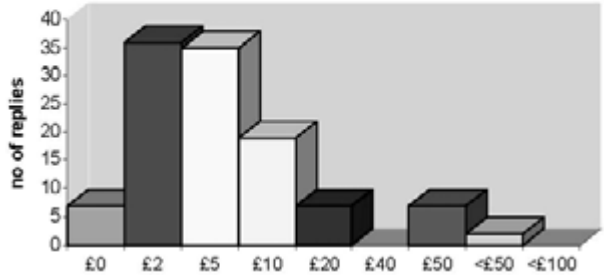
Question 3.7



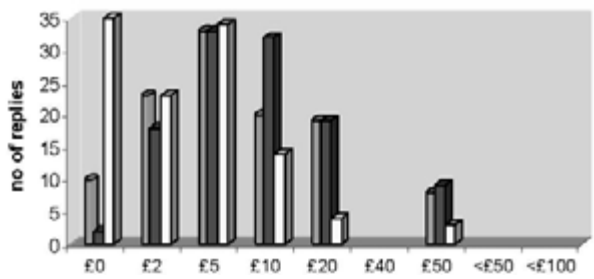
Question 3.8



Question 3.9



Question 3.10



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Part IV:
Proposal for the Incorporation of Environmental Economics in the Cyprus Planning Policy Framework

21. Introduction – The Purpose and Structure of the Proposal

The purpose of this Proposal is to bring forward the most salient proposals emanating from the development of the *Environmental Economics Activity* within the framework of *CAMP Cyprus*, with particular emphasis to the incorporation of Environmental Economics in the planning policy framework. It is intended as an executive summary to inform policy makers in a few words *what* should be done, and *how*, to facilitate the implementation of the proposals.

This Proposal draws upon the analysis and conclusions developed by the four previous outputs of the *Environmental Economics Activity*, namely:

- The **Workshop** conducted at the Planning Bureau in May 2007 on the main principles, methodologies and issues of *Environmental Economics* with particular emphasis to coastal areas.
- The **Guidelines** on *Environmental Economics* prepared and distributed in June 2007.
- The *Pilot Application Case Study* of the Southern Larnanca Coastal Area completed in December 2007.
- The **Workshop** at the Planning Bureau on the presentation of the *Pilot Application Case Study* conducted in December 2007.

The Proposal has two short chapters:

- The **first chapter** outlines the existing gaps in the planning process with regard to the use of Environmental Economics, specifically Resource Valuation Assessment and Economic Instruments.
- The **second chapter** puts forward proposals for introducing changes to the planning process to incorporate Resource Valuation and Economic Instruments.

22. Existing Gaps in the Development Plan Process

22.1 Lack of Economic Tools For Valuing Coastal Resources

The planning process in Cyprus is fundamentally regulatory with a strong physical planning bias. Its core instrument is the zoning system which defines allowable land uses in various locations supplemented by building development standards. Zoning is the "cutting edge" of the existing Development Plans. While the Development Plans include reference to goals, objectives and put forward land use policy provisions, the choice and contents of policies are not supported by reference to an economic assessment of the changes they cause to the quality of coastal resources and to the distribution of benefits (gains and losses) across society. Another limitation arising from the reliance for coastal resource management on spatial planning regulation is the recurrent public reaction it encounters, whereas if spatial planning uses benefit analysis, assessing the multiple benefits that policies create, it will become more effective as a tool for coastal resource management and acquire wider public support.

The lack of economic information and benefit analysis in the planning process makes it difficult to strengthen the justification of the Development Plans and the policies they propose. Such justification is necessary to increase the social relevance of the Development Plans and build up greater public, political and financial support for implementation. To achieve that, the Development Plans should demonstrate the benefits they deliver in terms of the expected improvements in the quality of coastal resource and/or the reduction of damages to the quality of coastal resources expected to be achieved by the implementation of Development Plans. This will make the planning process of *strategic importance as a component within an integrated coastal area management framework*. A further limitation of the lack of benefit analysis is the weak appreciation of the contributions of conservation of coastal resource to both biodiversity and economic activities. This is particularly important given the emerging threats to the quality of the coastal environment in Cyprus and their longer term consequences. This is the area where Environmental Economics makes an important contribution by highlighting the type, extent and value of conservation benefits for level-field comparison between conservation and development.

As the Case Study has shown, coastal resources generate direct, indirect and existence benefits. Without consideration of these benefits it is difficult to justify increased protection of vital coastal resources (beach quality and access, coastal landscape and views, coastal marine biodiversity, water quality, etc.) and easier to assign higher priority to development options. The Case Study, as well as experience in other Mediterranean and European countries shows that incorporating environmental economics in the planning process provides:

- **Information support** for valuing coastal resources and measuring their environmental, social and economic benefits for decision-making.
- **Public awareness** of the multiple benefits of resource conservation necessary for changing the current perception that conservation is "anti-development".
- **Language to communicate, present and justify** investment proposals to Economic and Finance Ministries for Integrated Coastal Area Management who are called upon to pay for the costs of proposed measures and policy changes.

22.2 Lack of Economic Instruments for Adjusting Externalities And Raising Revenues For Environmental Investment

The fundamentally regulatory orientation of spatial planning policies, enforced primarily through land use and density zoning, encounters the following two problems as a tool for environmental management, ***first*** it cannot address the distributional issue (gains and losses of value and wealth) created by zoning restrictions/provisions, and, ***second***, it often resorts to over-zoning for development as to attempt to solve this distributional issue but at the expense of conservation.

Given the importance of environmental quality for coastal development, regulation alone is an insufficient instrument for implementing sustainable development policies in the future. There is a need to combine regulation with economic instruments to correct for the creation of losses and "unearned" gains inherent in the use of zoning which essentially creates "wealth effects" through administrative decisions. Thus, instruments are needed to settle this "*windfalls and wipeouts"* situation.[12]

In Cyprus, at present, there are three main categories of instruments that relate to urban and coastal planning and management:

- *Land Use Planning Instruments* used in the course of implementing Development Plans. Most, if not all, are physical instruments tight to the control of development via the procedure for issuing Planning Permissions.
- *Taxation instruments* which apply across the property market for revenue raising purposes outside the ambit of the planning system.
- *User charges* which are levied by competent authorities responsible for the provision of services to recover costs.

A catalogue of the existing Instruments is presented in the Table 47.

Table 51: Development Instruments Used in Cyprus – A Partial Menu

Instruments	Main target/impact
1. Land use planning	General control of development
2. Property taxation (Immovable Property Tax, Capital Gains Tax, Land Transfer Fees	General revenue raising
3. Direct planning interventions / Planning Schemes	Creating local level development
4. Land acquisition (Land acquisition by agreement, Land exchange, Compulsory land acquisition, Land take (conditions on planning permission)	Land acquisition for infrastructure, housing, utility services)
5. Land use zoning and specific building regulations (density, coverage and other development conditions)	Regulating local level development
6. User charges/fees for utility provision (water, sewerage, road improvement, pavements, and planning / building licenses)	Partial or full cost recovery revenues
7. Conservation of traditional heritage buildings (Building conservation grants and tax concessions and Transfer of Development Rights from listed buildings	Encouraging conservation of listed building Reducing / avoiding compensation costs

There is an evident lack of economic instruments operating **within the planning system itself** and targeted at (a) addressing the distributional consequences in planning and (b) capturing increments in land values created by planning policy decisions.

Examples of such economic instruments include the following:

- ***Land value increase taxation (betterment tax)*** – Taxation of land value recapture due to planning decisions affording premium development rights
- ***Transfer of development rights*** – Instrument for conserving environmentally sensitive, landscapes, heritage sites, valuable natural areas or coastal open spaces.
- ***Environmental Fund*** for channelling locally or nationally raises revenues, raised from such and other sources, to finance local environmental investment for various improvements.

[12] "Windfalls and Wipeouts" is the term used by a classic work on the issue, Misczinski and Hagman, 1979, "Windfalls and Wipeouts", New York, otherwise described as "betterment and compensation" "Land Policy in Planning", Nathaniel Lichfield and Haim Darin-Drabkin, 1980, and originally expressed in the authoritative work of the Uthwatt Commission Report in the UK., Royal Commission on Land Values, 1939 (Uthwatt Report).

23. Proposals

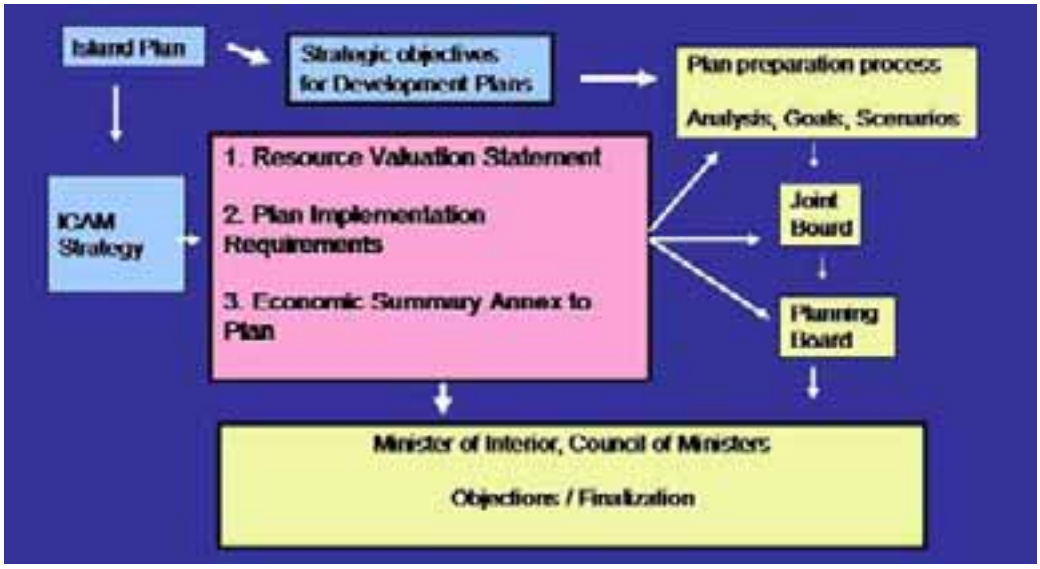
23.1 Proposal in Outline

Three important elements should be incorporated in the planning system:

1. **A Resource Valuation Statement should be prepared as part of the analysis leading to the preparation of the Development Plans:** this Statement should reflect a broad review of the existing and potential threats to the coastal environment and the benefits of policy options and contemplated limits to development envisaged by the Development Plans.
2. **An Implementation Requirements Statement should be included in all Development Plans when presented to the Joint Boards and the Planning Board:** this Statement should present the interventions envisaged for the implementation of the Development Plans and their likely investment cost, the Economic Instruments to be used and the correcting and revenue raising effects they aim to address.
3. **An Outline Economic Summary Annex should be included in the Development Plans when presented to the Minister of Interior and the Council of Ministers for approval:** this Annex should present all the major economic and financial parameters and repercussions of the Development Plan, including social and economic benefits, and the likely environmental costs if the plan, or specific policies, are not implemented.

Figure 11 presents an outline of the incorporation of the above three new elements in the planning process.

Figure 11: Incorporation of Environmental Economics in the Planning System



The ***Island Plan***, to which the ***Strategic Development Plan 2007-2013*** assigns importance (Chapter 8, page 167), will contain as a central element the ***Integrated Coastal Area Strategic Management Framework*** (See CAMP Cyprus ICAM Report). Within the ICAMSF, a Resource Valuation Study will be prepared, following the broad principles and methods elaborated in the *Environmental Economics Guidelines Document* (June 2007), to provide information and analytical support for an all-round and true socio-economic valuation of coastal resources with reference to the benefits arising from maintaining a balance between development and coastal protection. The outputs will be available as a basis for the preparation of the *Resource Valuation Statement* within the context of the lower-level Development Plans (Local Plans). However, the preparation of the *Resource Valuation Statement* for

the Local Plans and Area Schemes should not rely entirely on the *Island Plan* level appraisal but be undertaken in any case focusing on the specific area covered by the particular Development Plan.

Each Development Plan will contain an *Implementation Requirements Statement* as defined above for presentation to the relevant Joint Board and the Planning Board and an *Outline Economic Summary Annex*, also as defined above.

23.2 Economic Instruments – Applying Economic Instruments For Increasing Revenues For Environmental Investment

23.2.1 Instruments for saving funds

Proposed Instrument: Transferable Development Rights

To promote and implement effective coastal resource management, and to the extent that conservation will be pursued through prohibition of further development in any particular coastal area, the issue of compensation for proven loss of any existing development rights in the conservation areas will arise, potentially entailing budgetary expenditure.

An alternative to compensation is the use of **transferable development rights** allowing the disaffected owners to use or sell the development rights in approved and properly planned areas elsewhere without financial burden on the budget. This instrument has been proposed by the World Bank *Management Plan for the Akamas Peninsula* (1995) and the World Bank METAP Report on the *Use of Fiscal Instruments (1992)*. This Instrument is currently applied for the conservation of listed buildings. However, in the recent dialogue (2007) of the competent Ministers (Agriculture and Interior) with the Akamas communities regarding the implementation of the new version of Akamas Management Plan, the application of the Transfer of Development Rights in a land use context has been put forward. It is therefore reasonably assumed that this Instrument in principle positively considered and politically acceptable for application.

23.2.2 Instruments For Additional Funds

Proposed Instruments: Betterment Levy/Tax

Decisions for development and conservation along a coastal area creates two effects in favour of the owners of land and property within the development zone(s): (a) financial benefits through development and (b) environmental and financial benefit through securing a conservation zone adjacent to that property safeguarding continued environmental amenity by restricting development "next door". Both are "unearned economic benefits" and should be taxed (to return part of the benefit to society) under the **betterment provisions** of the Town and Country Planning Law (Section 80 of the Law). Taxing for affording increased development rights is a clear of betterment, while the taxing for the safeguard of continued environmental amenity may be viewed as quasi-betterment and can be taxed either under the betterment provisions of the Town and Country Planning Law or under the existing general **property tax system** (local or national). In both cases, the use of these economic instruments, apart from correcting "*externalities"*, will **generate revenues** available for coastal management investment which will ultimately benefit the whole local area. It is noted that in both cases legislative adjustments will be required, such as regulations activating the Betterment Provisions of the Town and Country Planning Law and changes to the property tax.

23.2.3 Instrument For Mobilizing Funds

Proposed Instrument: Environmental Fund

There is now the question of the "appropriation" of revenues, in other words where will the money go. The revenues should better be deposited in a local **Environmental Fund** for **reinvestment in the area for environmental improvement expenditure from which revenues are raised**. This local

financial allocation will not only increase the acceptability of the economic instruments but will also channel finance to the local communities which are presently financially stricken and entirely dependent on central government transfers. It is noted that the financial and functional strengthening of local authorities is one of the main objectives of the Cyprus *Lisbon Strategy* and the *Strategic Development Plan* 2007-13.

The Environmental Fund will require legislative actions providing for management partnership between central, district and local level administration. As this instrument does not exist at present, an alternative 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 roughly the same way that the existing money transfers take effect.

In summary, the changes proposed and their integration into the policy framework are presented below as follows:

Table 52: The Proposed Changes And their Integration into the Policy Framework

Island Plan	Proposed in the new Strategic Development Plan 2007-13
Coastal Zone Management Strategic Framework	ICAM Report under CAMP Cyprus and reference to CAMP Cyprus made in the new Strategic Development Plan 2007-13
Resource Valuation Statement Implementation Requirement Statement Economic Summary Annex to Development Plans	Existing plan development and approval process under the Town & Country Planning Law (T&CPL)
Instruments:	
▪ Betterment Tax	Section 80 of the T&CPL
▪ Transfer of Development Rights	Proposed in the Akamas Management Plan and recent references to its application in the dialogue of the Government with the Akamas communities
▪ Property Tax	Existing Immovable Property Tax
▪ Environmental Fund	Requires management structure/regulations

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Environmental Economics

CAMP CYPRUS

CAMP Cyprus is a programme implemented jointly by United Nations Environment Programme Mediterranean Action Plan (UNEP/MAP) and the Government of Cyprus through the Environment Service of the Ministry of Agriculture, Natural Resources and Environment. CAMP Cyprus sets out to address problems and issues of sustainable development of coastal areas with a view to improving further existing policies and practices towards the coast.

In the period 2005-2008 the following CAMP activities have been implemented:

- Methodology of Integrated Coastal Area Management:
  - Integrated Coastal Area Management (ICAM)
  - Sustainability Analysis and Indicators
  - Biodiversity Concerns in ICAM
- Tools of Integrated Coastal Area Management:
  - Strategic Environmental Assessment
  - Carrying Capacity Assessment
  - Environmental Economics (Resource Valuation and Economic Instruments)

UNEP MAP PRIORITY ACTIONS PROGRAMME