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**Rosh Haniqra Marine Reserve  
Socio-economic Analysis**

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# **Rosh Haniqra Marine Reserve – Socio economic Analysis**

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## **Abstract**

Use and non-use value are being identified for the proposed Rosh Haniqra Marine Reserve (RHMR). They are divided into commercial and ecological values. A conflict range was determined in order to better understand the major alternatives faced by policy makers and planners in order to achieve a sustainable development phase for this region. Finally, a price analysis was conducted in order to better understand how economic incentives could achieve ecological conservation. A closed coast road can cause a massive tourist pressure on sensitive areas in the site itself. Using the TCM, a simulation was performed on estimating the effect of pricing on the number of visitors. Revenues achieved could be used either for cost recovery as well as for controlling the number of visitors. The results point out the commercial value of the site itself is about 20 Million NIS (about 4.5 Million \$). CVM results reveal a total value of about 65 Million NIS out of that the use value is about 35 Million NIS. TCM analysis reveals a use value of about 37 Million NIS. Further analysis should be carried out as to the interaction between visitors and ecological performance and about value added of the site in the future. However, it could be concluded by now that the preservation value is quite significant and should be taken into account in further development plans of the region.

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## **1. Introduction:**

The purpose of this study is to examine the Rosh-Haniqra Coastline from both its commercial as well as its ecological values. In this paper we identify the different stakeholders in the region and the array of goods and services that is provided by the coast.

The services and goods were classified as: market values; non-market use values and non-market non- use values.

Market values are actually determined by the price that is actually paid for them. For example, diving club services. All the relevant market services and goods facilities were mapped and identified in the relevant coastline. The actual value was determined by an interview with a representative of the facility. The value was first found for the present and also some forecasting was stipulated for the future. Because of privacy and anonymity conditions we were lucky in obtaining only revenue measures and not value added. However, this will be discussed in the interpretation of the results.

Non-market use values are values that are derived from being at the beach and performing an activity that is not being paid for. For example, diving, recreation and walking on the beach or watching birds and animals. While these functions do not have a market value they still have some value to the society. This value was measured by the most common method to value these kind of environmental goods and services: CVM and TCM surveys.

Non-market non- use values are the most difficult and most controversial. These values are associated with the benefit from habitats, biodiversity or bequest and existence motives. They are not even associated with visiting at the beach but still considered to be legitimate in the benefit valuation of environmental and natural assets. The only way to measure these values is through CVM methods, which is also recommended by NOAA panel, EPA and the World Bank.

This kind of research may provide decision makers and planners a crystal ball in the form of an array of database and associated values. In the case where there is a conflict between conservation and development, results of such study can be used to trace a tradeoff analysis between different goals. One major goal might be sustainable development of the designed reserve. Valuation of the different alternatives can be of help in answering that question.

The paper continues as follow. Next section describes the site itself. Section 3 describes the methodology used in order to value the site. Section 4 deals with taxonomy of the site to its commercial and non-commercial uses. Section 5 describes the TCM results, while section 6 the CVM results. Section 7 analyzes a management problem and finally section 8 concludes. while section 6 concludes.

In addition, there is an attached presentation in PPT that is given in a separate file which presents the major findings more visually.

## **2. Rosh Haniqra Marine Reserve:**

Humans have been using the Rosh Haniqra coastline for many decades. Archeology proved evidences for human activity like fishing, agriculture and crimson extraction industry. However, only in the last generation intensive activities have been being endangered the habitats and biodiversity.

Rosh Haniqra coastline can provide many services to human, including: infrastructures, municipal, military, industrial area, agricultural, fish habitat, nesting birds and turtles, recreation and unfortunately, sewage outlets. With excess demand by historic uses and increasing environmental awareness, these uses are competitive to preserving the area. A dynamic society requires monitoring and adjusting the mix of these ecosystem services as society's priorities change to insecure that the highest valued mix of services is produced. Since uses like fish habitat and recreation are not priced, this presents a challenge to coastline managements when coming to choose between these competitive alternatives.

The northern Israeli coastline, Rosh Haniqra is depicted in figure 1. It extends between the Israel-Lebanon international border and the Czive Wadi, and it is considered to be one of the most unique and diversified aquatic area due to it geomorphology, archaeology, flora and fauna. The diverse morphology at Achziv-Rush Haniqra coastline had been created varied landscape.

The northern Israeli shoreline, which extends along 6 Km and 100-200 m width ways only and it geomorphology, characterizes as a transition zone between the Israeli low sandy beach form and the mountainous Syrian-Lebanon beach type combine: soft limestone, cliffs and under water canyon.

Non-continuous soft limestone hills range cover most of the seashore and has crated shallow lagoons gulfs scenery.

**Figure 1: Map of the study area**



The Rosh Haniqra chalk cliff raises to 70 m then fall sharply into the water while the waves mined crevices and underground caves. The only under water canyon in Israel had been created by the Czive mouth. The unique structure and geomorphology of the Achziv-Rush Haniqra coastline has been stored a variety of habitats.

The Achziv-Rosh Haniqra seashore had been being settled by variety of cultures for hundreds of years and every culture has been leaving it one's marks on the ports, graves industry, agriculture, and more. Aczive City served as an important port since the Bronze Age for hundreds of years till the Crusaders age. The harbors remnants can still be observed. By the age of the King Salomon the Phonics had seized power and govern the region. They left ruined crimson extraction and glass industry. Also Graves and mortal cult residues can still be detected from all ages.

The Achziv-Rosh Haniqra coastline clement and geomorphology created exceptional flora and fauna. 451 Varity of plants had been documented on the shore, were 41 out of them are rare, endemic or protected plants. For example, although, aquatic mammals not often found in the eastern Mediterranean, still some aquatic

mammals were observed nearby Rosh Haniqra coast. Many migratory and nesting birds chose Rosh Haniqra coastline and cliffs as their home, at least for the winter season.

Along with the reptilian inhabitant at the coastline, *Caretta caretta* and *Chelonia mydas* had been counted. The existence of *Caretta caretta* and *Chelonia mydas* has been defined as a globally endangered species. In addition, Achziv-Rosh Haniqra seashore is one of the important nesting places for sea turtles.

The shallow seawater is rich with a variety of fish and Gastropoda. More than 60 species have been documented. Furthermore, this wealthy variety on such a restricted area has been found only at the Red Sea. Only a few coasts along the Mediterranean seashore have Gastropod reefs.

The Achziv-Rosh Haniqra coastline element and geomorphology created a special ecosystem but the fast commercial development, damming the wadis stream, sewage flow and other human activities interfere with the ecosystem. Although the value of the ecosystem services is not a market value like the commercial ones, it still affects human welfare. This depends on the value, which is derived from the resource. The different approaches to measure these values are the topic of the next section.

### **3. Economic theory and values:**

Welfare economics provides the theoretical background for estimating the economic benefits of an action. Economists usually assess the merit of an action based on its effect on the welfare, or level of welfare on humans.

Economic theory is based on the hypothesis that the decisions people make regarding their consumption bundle and preference array is based on the values they hold for these various goods and services available to them to choose from. The anthropocentric point of view of welfare economics implies that the economic value of an ecological resource depends on the value humans derive from the resource.

The type, quantity, and quality of goods and services available to an individual determine the individual's level of wellbeing, or intensity of welfare. Some goods and services are produced by industry and purchased by individuals in markets, some are formed within the household, government provides some, and nature or ecological resources provide various.

The condition of an ecological resource determines the type, quantity, and quality of goods and services provided by that resource. As a consequence, any action that affects an ecological resource, will likely affect the goods and services the resource provides, and subsequently the level of welfare of the individuals who enjoys those goods and services.

Under this approach, we measure the change in benefit associated with the change to each good and service provided by the ecological resource and sum these individual measures to estimate total benefits.

The Economic value of a good or service is determined by the maximum amount of something else (usually money) that an individual is willing to pay to obtain the good. This measure of economic value is called “willingness- to- pay” (WTP). For an environmental improvement, WTP is the amount an individual is willing to pay to obtain the improvement. For a unique natural resource the WTP is the amount of money the individual is willing to pay in order to prevent a shift to another state of the world without this unique resource.

WTP values reflect individual’s preferences for exchanging goods and services. Because preferences are likely to vary from one individual to another, WTP values for a change to a particular good or service will vary from one individual to another. The total social value of an improvement in a good or service is the sum of the WTP across all individuals.

Although economists are most often asked to value the change in social welfare (measured by WTP) associated with a change in a particular good or service provided by an ecological resource, they are also sometimes been asked to value the availability or existence of the ecological resource itself.

When an ecological resource provides some kind of service, a change in the state of the ecological resource affects the demand for that good or service. The change in demand may be realized through declined number of visitation days or scope of time spent, decreased amount of users, or decreased expenses to make use of a good or service provided by the ecological resource.

Some of the goods and services provided by ecological resources are obvious because they are directly used or enjoyed by society. These types of goods and services are defined as direct, market uses. They apply when the good or service is bought and sold through open financial markets. However, other type of uses are not been reflected through financial transactions but still provides some services to the

society and as such, their value should be measured. This is most important when there is a conflict between market and non-market uses and a decision should be made.

The direct, market uses of an ecological resource are the most obvious and most easily to be valued. This is so because price and quantity information for each good and service is commonly available and accessible. The non-market uses of an ecological resource may be readily apparent, such as recreational opportunities, beach use, bird watching, tourism, aesthetic value, diving and camping. These uses can be easily be seen and detected. However, valuation of these non-market uses are more difficult because the goods or services are not sold through markets, making it more complex to obtain information on the "price" of the service hence how the change will effect the users.

In addition, ecological resources also provide some services and ecological processes that indirectly benefit society. For instance, wildlife habitat or biodiversity service. These types of services, which are not sold through markets and cannot be detected as attracting people into the site, are referred to as indirect, non-market uses.

However, these indirect and non-use services also have their value associated with them. Several different categories of non-use values have been recognized. Non-use values represent the value, which an individual places on the ecological resource that does not depend on those current uses of the resource. Existence value, for example, refers to the value people place on knowing that a particular resource exists, although they have no expectation of using the resource. Bequest value, which refers to the value people place on maintaining a resource for future generations and altruism that is the value people place on maintaining resources, which are important to their family and friends.

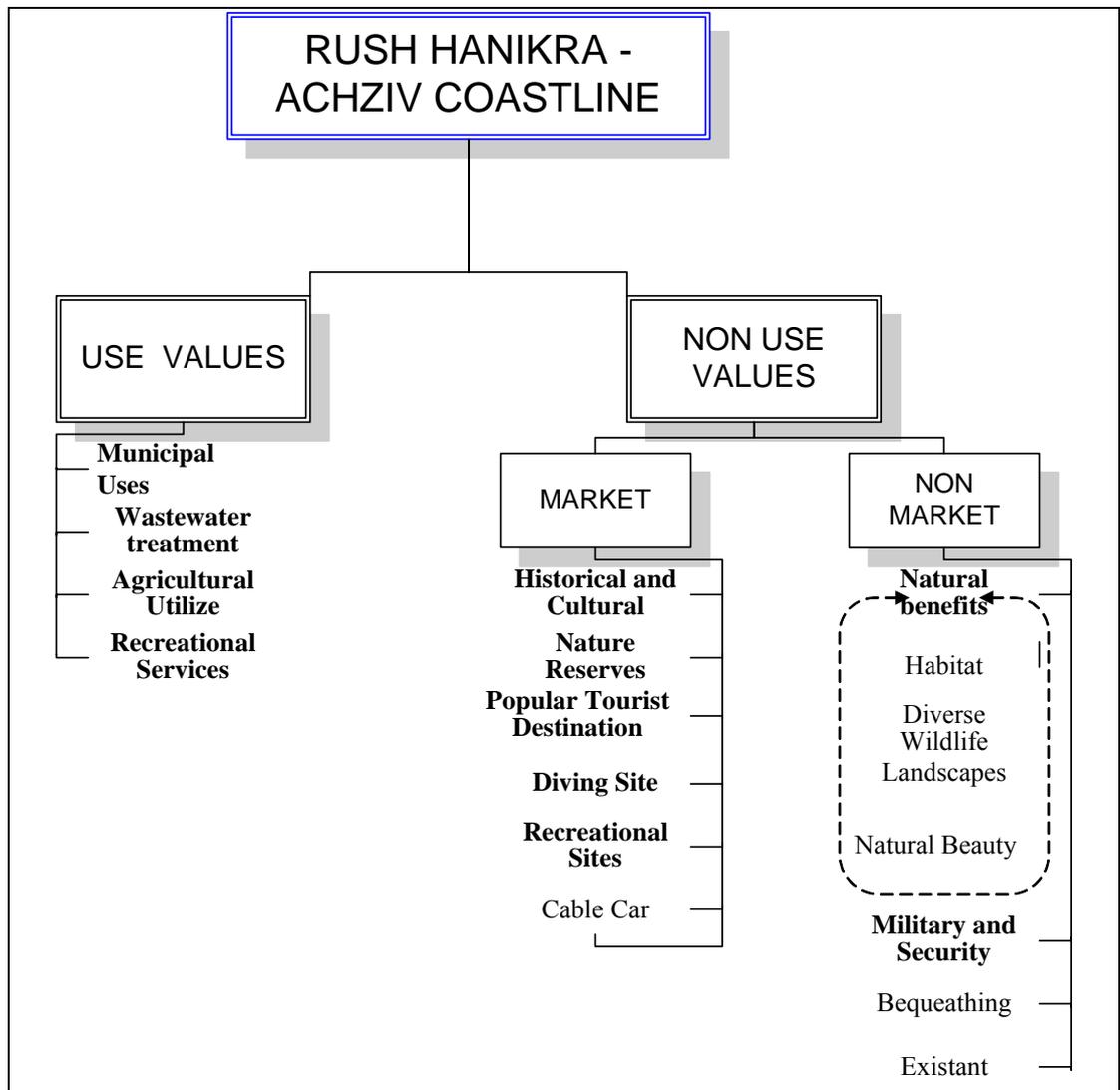
### **3.1 Values in the proposed reserve**

Both use and non-use values are important in an area such as Rosh Haniqra – Achzive seashore. Use values are value obtained from the direct exploitation of resources, whereas non-use values can consist of existence value, bequest or altruistic value. Option value of preserving a resource so that it remains available for future generation, can be categorized as a short-term non-use value, but a potential use value in the long term. Within the category of use value, a distinction can be made between direct and indirect use. Direct use refers to active appropriation or utilization of

resources and includes both market and non-market goods. Market goods and services are those which are traded in markets, while non-market goods and services are those which are not themselves traded in a market but entail market expenditures that can be measured or estimated. Indirect use generally refers to non-consumptive, non-market goods and services that the ecosystem itself provides.

When coming to describe the different values attached to the proposed RHMR, we can classify the above values as can be seen in figure 2.

**Figure 2: Benefits provided by the coastline and Stakeholder Identification**



As can be seen from the figure, there are uses that exploit the reserve and are commercial in nature, uses that are not commercial but exploit the reserve as well and

uses that have a preservation motive attached to them. In addition, one can trace non-use non-market motives such as benefits from species conservation or preservation of a unique historical site.

### **3.2 Commercial use values:**

Commercial facilities are described in table 1. This numbers were originated through a representative sample that included most stakeholders in the coastline. The survey format is given in appendix 2. Not all the answers were recorded in the table because of partly irrelevance but the major findings can be traced in table 1.

**Table 1: Summery of commercial activities in Rosh Haniqra Coast line**

<b>Facility:</b>	<b>Activities:</b>	<b>Annual Visitors:</b>	<b>Future Development:</b>	<b>Owners:</b>	<b>Revenue:</b>
Rush Haniqra recreation site	48 guest rooms. Camping. SPA. Cruises Jeeps trips Coffee and restaurant.	35,000	Underwater aquarium Travels and trips center.	Police veterans	6,000,000 NIS
Achzive field School	42 guest rooms. Camping. Studies Guided trips Coffee and restaurant	N.A.			
Achzive recreation site	25 guest rooms Events facilities	12,500		The National nature reserves.	1,500,000 NIS
Mate Asher Financial Corporation.	Operation and Maintenance of Achziv, Bezet and the promenade	70,000	Foundation of 2 Recreation village sites	Public institution.	9,000,000 NIS
Rosh Haniqra site	Cable Car. Train. Restaurant Shop Kiosk	212,000	Development of 60 donums of camping active park.	Kibbutz Rosh Haniqra	1,400,000 NIS
Putsker site	Diving club Guided trips Cruise Bicycles for hire Shop Courses	10,500	Establish Restaurant and Increase the boats size.	Private	1,000,000 NIS.
Achziv National park.	Amusement park Coffee and restaurant Beach	60,000	Establish Restaurant. New Sewage	National parks and nature	1,200,000 NIS.

	Events Camping Picnics table		system. Anchorage	authority	
<b>Total</b>		<b>400,000</b>			<b>20,100,000</b>

Most of the facilities represented in table 1 are associated in some way or the other with recreation. This includes recreation villages, diving club, national parks, and restaurants and field school scatter alongside the shoreline and attract more than 250,000 visitors annually, however, increase in the number of visitors and extension of the recreational services will have a possible effect on the ecosystem and the landscape which attracts the same visitors. We will come back to the issue of conflict later on.

Achziv – Rosh Haniqra coast holds the potential for a variety of activities. The shoreline, which extends only along 6 Km and 100-200 m width ways, has accommodated alongside infrastructures, municipal, military, industrial area, agricultural, recreation and unfortunately, sewage outlets. In addition, there is a continues pressure for further development related to commercial human activities. This can be clearly seen from table 1 in the column **Future Development**. As mentioned before, the revenue is the best estimate for the commercial activities. It sums to about 20 million NIS annually. Number of total coast users is about 400,000. However, parts of them are multiple users who enjoy more than one facility. In order to get a lower bound we can use the largest number of a single use, 212,000.

### **3.3 Sources of conflicts:**

Sources of conflicts rises due to preservation values that stands in the way of current and future development efforts. WE briefly describe first the preservation phase before moving to the conflict.

**Natural benefits** provided by the Rosh Haniqra – Achzive coastline include a home base for the diverse habitat fauna and flora of over 450 species of plants, birds, amphibians and reptiles including endanger species, rare aquatic mammals, and more than 60 fish and mollusks species. It is also a home to soft limestone hills range, white cliffs fall into the water, islands, under water canyon and shallow lagoons landscapes, several nature reserves and other areas prized for their natural beauty.

Among the numerous **historical and cultural** attractions of the Rosh Haniqra – Achzive coast setting are the old port city of Achzive, the Rosh Haniqra mound, Misrafot Yam mound, Haniqra under water caves and crevices and memorial sites diving site and recreational sites. Given, the numerous natural and cultural attractions, Rosh Haniqra – Achzive seashore is a popular tourist destination for both local and international tourists.

**Wastewater treatment** plants at different treatment level have been located at this coastline, which the treated wastewater and sometimes gross-sewage are used the seashore as an outlet. In addition asbestos waste had been buried at this coastline. These direct coast uses are not even considered legitimate uses since they violate international conventions hence, they will not be considered in this study.

Several **agricultural practices** can be found along the coastline. Banana plantations and other crops border the natural reserve and seaweeds growth marine agriculture plant can be found near Rosh Honiara.

**Military and security** applications have been derived from the location of the beach at the Lebanon- Israeli international border. Thus, military activities influence the coastline.

IDF and UN bases and infrastructure scatter along the seashore. The expedition of these military bases will affect the natural reserve. Military activities such as army patrols and shooting could hurt the nesting colonies and the coast. Security needs requires 24 hours lighting. The light damages the *Caretta caretta* and *Chelonia mydas* nesting and egg laying.

However, it should be noted that military activities and security demands often closed the coastal area to civilian activities. These closed reigns assisted to preserve the habitats and its components.

We traced a large number of conflict sources. They are being represented in table 2. It should be noted that we included all potential conflict sources no matter the solution reached. That is, if we found a conflict that was solved in favor of preservation, we still included it and remarked on that. This was done in such a way in order to better understand future changes in the area. Once we understand the nature of the conflict, we are in a better position to value the alternative values and to present these values to decision makers.

**Table 2: A conflict potential in the Rosh Haniqra Marine reserve**

Facility	Type of Use	Potential Conflict	Environmental Sensitivity	Remarks
Rosh Haniqra Grotto site – Current phase	Observation and cable car to the Grottos	Within the national park and a unique resource	High	Site declaration exceeded to national park
Rosh Haniqra Grotto site – Future phase	Expansion of parking lots	Contains mountain drilling	Medium	An alternative solution is thought
Betzet Beach – Current Phase	Authorized beach	Sea turtles needs a special preservation plan	High	Declared as a permitted swimming beach
Betzet Beach – Future phase	Expansion of uses	Sea turtles needs a special preservation plan	High	Restricted to current size
Eli Avivi's village	Museum, guest rooms, camping site	Located within the national park	High	Site declaration exceeded national park declaration
National park Achziv – Current beach activities	Authorized beach, Camping site	Located in the national park and on historical site	Medium	Restricted entrance due to carrying capacity
National park Achziv – Future beach	Overnight stay, restaurant	Located in the national park and on	Medium	Restricted to low development at

activities		historical site		current facilities
Club Med – Current phase	Camping site, guest houses, beach	Located within the national park – some uses do not match the national park	High	Site declaration exceeded national park declaration
Club Med – Future phase	Will start to be operated by a French company on 2005	Located within the national park – some uses do not match the national park	High	Full use from 2005
Regional county Acziv – beach activities: Current phase	Authorized beach	Located within the proposed marine reserve (Sea turtles potential)	High	Declared as authorized beach. There are disputes on way of operation
Regional county Acziv – beach activities: Future phase	Further development, army activities and boat activities	Located within the proposed marine reserve	High	Restricted to its declaration range
Tourist beach road – Current phase	Enables easy access to the beach	Boulders prevent access to the beach. However, easy access cause more visitors to the area	Very high	Former army patrol road

Tourist beach road – Future phase	Payment to enter into the road	Low - Would help navigate visitors into well defined parking lots	Very high	
Soil Conditions – Current phase	Development plans including building new infrastructure	Each development plan causes changes in the soil flow.	Very high	National scale problem due to disappearing soil in the coast region
Shallow water area – Current phase	Amateur fishing. Bate and diving	Vermetied reefs	High	Very high biological diversity area
Diving clubs – Current phase	Diving school, professional diving, fishing diving	Only with respect to fishing diving	High - Medium	Marine reserve management plan is in progress
Diving clubs – Future phase	No access to fishing diving	Proposed Marine reserve	High	Should be analyzed within the marine reserve management plan
Marine tourism	Diving, Yachts, fast motor boats	Proposed Marine reserve	High	Boat landing
Road conditions and train development plans	Easy access to the marine	Carrying capacity	Medium	It would have to bypass current paths (train goes only till Naharia)

Developing of allowed beach activities	Agricultural, tourism and recreation	With the National Park and the proposed Marine Reserve	Medium to high	Conditioned on prevention of further natural resource damage.
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As can be seen from table 2 the following major conflicts were identified:

- ❖ Coastlines in the proposed reserve are in the development plan of both Rosh-Haniqra site and the regional county “Mate Asher” in front of the Achziv National Park. Same goes with respect to the Betzet beach were it is considered to be the major egg laying for the Sea turtle.
- ❖ Creating a Coat road along the former army patrol road has mixed impact. On one side it created a convenient parking stock not along the beach. However, on the other side the increased convenience attracts more visitors, especially in the weekends. This has a negative impact on the sensitive areas in the proposed reserve.
- ❖ Increased development along the beach has a negative impact on the sand movement along the beach.
- ❖ Planned development of the marine tourism has a potential negative impact on the flora and fauna in the reserve. This might include increased diving activities, motor boats etc.,
- ❖ Shallow water preservation is considered to be one of the goals of the planned reserve. Increased pressure due to a large amount of visitors can harm flora and fauna at this sensitive area.
- ❖ Increased traffic at he North-South bound along the seaside. Potential peace agreement and prosperity projections can cause more pressure on the site itself due to a larger amount of people that will decide to make this place a stopover.

#### **4. Valuing Direct, Non- Market Uses**

In order to assess management option it is necessary first to understand what are the values of preservation and how should we go about to value them. Since these types of goods and services do not have market prices, non- market assessment methods should be used to estimate the embedded prices for the goods and services provided by the resource. Usually these techniques are classified into two categories: Reveled preference method like Travel cost and stated preference method as Contingent valuation method. These methods are also called indirect and direct methods respectively. We will use two methods; Travel Cost and Contingnt valuation to be described first.

**Travel Cost Model (TCM):** The Travel Cost Method, **TCM**, was first suggested by Harold Hotelling right after World War II (Kolstad 2000). The U.S. National Park Service solicited advice from a number of economists on methods for quantifying the value of specific park properties. The purpose was to show that parks and other outdoor recreation sites have benefits higher than the cost of protecting them with the taxpayer's money. Hoteling came up with the idea of travel cost as a reflection of the value visitors to the park place on it. The method that Hotelling suggested has been frequently used since, especially since the late 1960s, with the work of Clawson and Knetch (1966). It is used mainly to value the recreational benefits of a park, whether they are from camping, fishing, hiking or wildlife watching.

The basic assumption underlying the method is that costs an individual incurs in visiting a recreational site reflects a lower bound on the person's valuation of the site. The recreational value of a park is revealed by how many people travel how far to visit it, since the cost of travel is, actually, the cost of a visit. By asking visitors questions relating to where they have traveled from and the costs they have incurred, a distance visit function can be estimated. Demand curve for the park can be generated at the second step by raising hypothetically the cost of the visit and find out how it effects total visits to the park by using the previously distance visit function. This curve is downwards sloping in the sense that admission price (or as it seen to the visitor the) travel cost is inversely related to number of visits: as we raise the travel cost, only those living near the site would finf it still relevant to visit. The information requested in a TC survey includes travel cost (petrol, food and other travel-related

expenses), entrance fee, alternative sites on that trip, personal motivations and socioeconomic characteristics.

There are two forms of TCM: the **Zonal Travel Cost Method (ZTCM)** and the **Individual Travel Cost Method (ITCM)**. In the ZTCM, concentric zones are defined around the park such that the cost of travel from all points in a given zone is approximately constant.

Visitors to the park are grouped according to their zone of origin. By comparing the cost of coming from a zone with a number of people who come from it and the population of that zone, one can plot a point for each zone. A function can then be fitted to all the points, to generate the distance-visit function (1).

$$(1) V_h / N_h = f(C_h, X_h)$$

Where:  $V_h$  = number of visits from zone h

$N_h$  = population of zone h

$C_h$  = travel cost from zone h

$X_h$  = a vector of socioeconomic variables that explains changes in  $V$ .

Socioeconomic variables are used to control for other motivations to visit the site (education, income etc.,). However, if these characteristics are the same all over the regions, then, a hypothetical price raise will effect visitation only through the cost component and its associated coefficient.

This function can be used to calculate the effect of raising the price on the total number of visits to the site. By raising the price repeatedly, the demand function to the site can be obtained. Keeping in mind that demand function is actually the marginal benefit of the good, one can get the total benefit by integrating the function itself. It is especially so when the entrance to the park is free so the total benefit of the park is simply the area under the demand curve.

The ITCM uses the number of visits per annum made by an individual, rather than average zonal visits, as the basis for generating the demand curve. The trip-generating function for the ITCM can be stated as follows (2):

$$(2) V_i = f(C_i, X_i)$$

Where:  $V_i$  = number of visits made by individual i to the site

$C_i$  = cost of visits by individual i to the site

$X_i$  = socioeconomic factors affecting individual i's visits to the site

Implementing the ITCM requires a large sample of visitors that vary in their visitation rate. We use in this report only the ZTCM but we have the information available to use the individual as well.

When calculating the actual travel cost, two types of costs should be taken into account: (1) The cost of driving itself (2) The opportunity cost of the time spent on the way to and from the site plus the time spent at the site. The opportunity cost of an hour of travel time during weekends (where most of the visitors are coming to watch wildlife) is 25% of the average net hourly income (McKean et al. 1995).

**Contingent Valuation** study measures consumer welfare (consumer surplus) gained from conservation of the aquatic area using Contingent Valuation Methods (CVM). Briefly, the contingent valuation method relies on surveys of consumers in which they are directly asked about their willingness to pay (WTP) for maintenance of a resource at a particular level of quality, for avoidance of some damage to a resource or for improvements in the environment quality or quantity<sup>2</sup> and frequently used for placing monetary values on environmental goods and services not bought and sold in the marketplace. CVM is usually the only method feasible for including passive use (non-use) values in an economic analysis<sup>3</sup>. In this case, willingness to contribute to a conservation fund was used as a proxy to identify WTP for samples from visitors along the coastline.

A contingent valuation survey consist four parts:

- Background information on the situation and possible changes to be made.
- A detailed description of the goods or changes for the good being valued and the hypothetical method of payment.
- Questions to elicit the respondents' willingness to pay for the change being solicited.
- Questions to collect socio-demographic to validate the willing to pay response.

TC and CV methods have been being developed since the 70's to measure the economic value of different type of ecosystem and scenery goods and services that have an effect on the human's welfare from an anthropocentric point of view.

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<sup>2</sup> EPA; framework

<sup>3</sup> Carson (2000).

However, the difference between the two methods is that TCM measure use values by means of visitors behaviors, which are assumed to be familiar with the site itself. Trip costs and exposition apply as actual proxy willingness to pay. Conversely, CVM measure both use and non-use values and CV respondents may not be most familiar with the resource. In order to assess real willingness to pay the respondents should be familiarized with the site by different types of illustrations.

## **5. Applying the TCM to the RHMR:**

### **5.1 Visits distribution**

Before we move to describe the TCM survey and results we have to describe the visits profile to the proposed reserve. As will be seen later on this is crucial to both valuation and pricing issues.

The following characteristics were reported by the regional nature reserve ranger – Mr. Guy Cohen:

- ❖ Pick days are Friday (2500 visitors), Saturday (3500) and Sunday (2000).
- ❖ Monday to Thursday are non-pick days (750 visits in each one of them).
- ❖ These numbers refers to the swimming season – 5 months long.
- ❖ Out of season – the reserve is almost empty.
- ❖ Maximum carrying capacity of 6000 people.

This brings the total visitors at the proposed marine reserve to about 220,000 visitors per year. It is consistent with the largest facility in the region – Rosh Haniqra Grottos that reports on the same number.

### **5.2 TCM Survey and Results:**

A study was accomplished among visitors to the Rosh Haniqra coastline in 2004. The survey included 200 respondents, about 0.001% of the visitor's population. They were asked about the frequency of their visits, place of origin and other sites they intend to visit on that trip. These data were then analyzed by the zonal travel cost model (ZTCM). Socio-demographic information was also collected in order to detail any differences between respondents coming from different regions and in order to enable extrapolation of the study results to the general public.

A travel cost is a function of distance from the site; five regions within a radius of 25 kilometers were chosen while the observed population arrived from a distance up to 150 kilometers away. Therefore the 6th region was added with zero visits from. A t-test found no socio-demographic significant differences among the 6 regions. In order to find the most driving factors influencing the number of visits to the coastline, nine variables were evaluated: gender, age, education, income, family status, origin, environment organization membership, number of children, and travel cost. A strong correlation exists between the cost of the trip, or *correlated distance*, and the number of visits per capita. In fact, this was the only variable deemed important at a level of significance of 95% or more. Hence a travel cost function can be written in (3):

$$(3) \quad C_i = (W/4) * (T_i) + ((5+KM_i)*2.1*2)$$

Where the subscript  $i$  represents a visitor from the  $i$ -th region, and  $C$  = travel cost

$W$  = forgone wages (opportunity cost) per hour

$T$  = average trip length from any home region (in hours)

$KM$  = the distance of the home region from the coast (in NIS/kilometers) +5 kilometers for winding roads.

The cost of an hour of labor ( $W$ ), was calculated by taking the average surveyed salary per month, and dividing that number by 180 labor hours per week. This is divided by 4 to get 25% out of that number in order to obtain the opportunity cost of a recreation hour.<sup>4</sup> It was then multiplied by ( $T$ ), the average trip length based on travel from the respondent base region plus average stay (3 hours) for each visitor. In addition, five kilometers were added to the number of kilometers traveled to the coast for non direct roads<sup>5</sup> and then was multiplied by 2 to reflect a round trip. This number is then multiplied by the price per kilometer based on the calculations of Heshev (2002) which is 2.10 NIS/km.

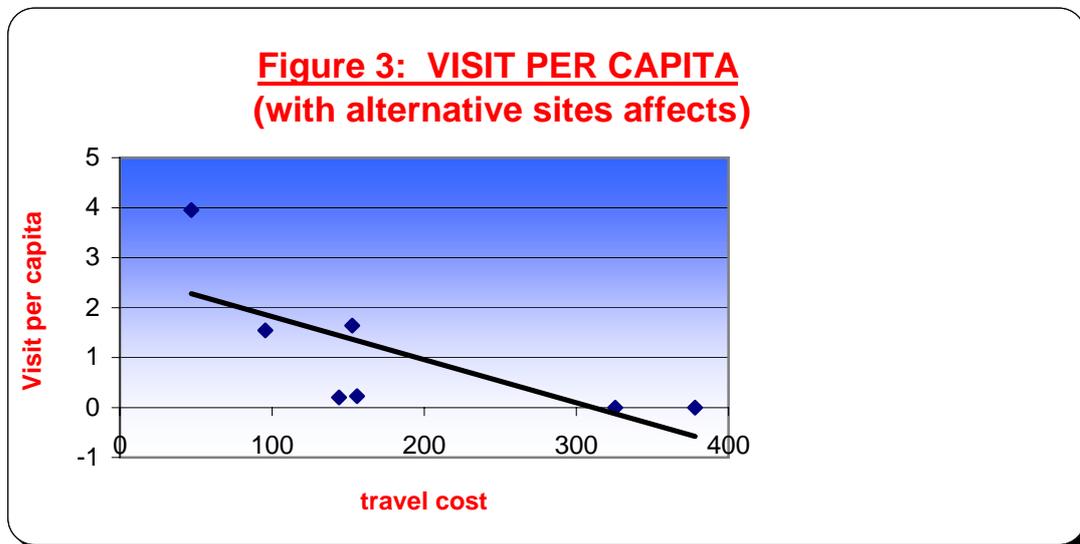
Figure 3 is a graph representing the calculated demand for recreational visits per capita to the Rosh Haniqra coastline as calculated by performing a regression of

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<sup>4</sup> As people value work time and recreational time differently, it is common practice to only calculate a fraction of the lost wages when accounting for the opportunity cost of time in a travel cost study (Freeman, 2003).

<sup>5</sup> Heshev, 2002.

travel cost on the visit per capita at each zone. As seen, the regression depicts a linear line, which found out to be the best representative of the given points.

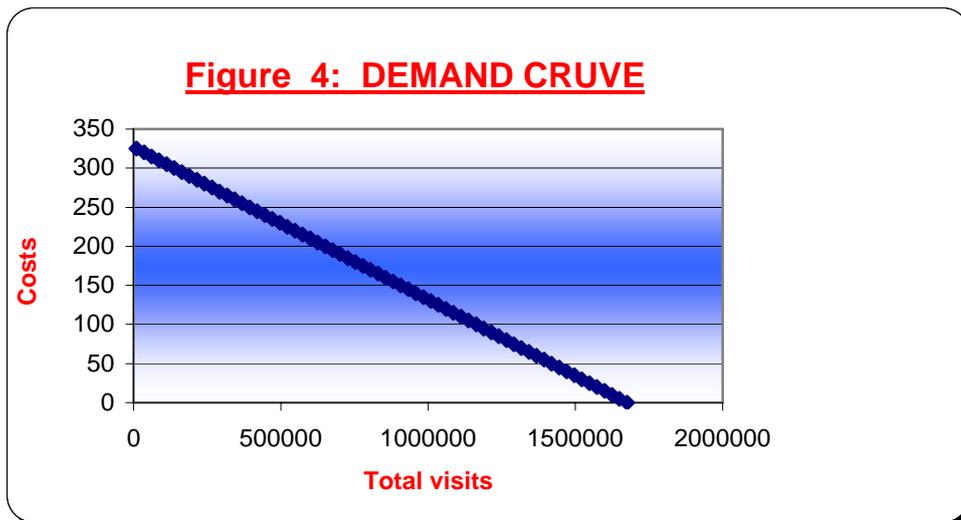


The regression equation is given in equation 4 while table 3 summarizes the regression output.

<b>Table 3: Regression Statistics</b>				
Multiple R	0.794244037			
R Square	0.630823591			
Adjusted R Square	0.556988309			
Standard Error	0.000964581			
	Coefficients	Standard Error	t Stat	P-value
Visits per capita	0.003318136	0.000847985	3.912964	0.011261364
Travel cost	-1.0149E-05	3.47217E-06	-2.92295	0.032900683

$$(4) \text{ Visit per capita} = 0.003318 - 0.000010149 \text{ travel cost}$$

The second step is to simulate a price increase according to (2) and trace the demand function. This is given in figure 4 below and table 4.



**Table 4: Regression analysis for the demand function**

Multiple R	1			
R Square	1			
Adjusted R Square	1			
Standard Error	5.38167E-14			
Observations	84			
	Coefficients	Standard Error	t Stat	P-value
Price	326.9287615	8.24247E-15	3.97E+16	0
Visits	-0.019512422	9.45063E-19	-2.1E+16	0

As explained before the area under the demand curve in figure 4 should represent the benefit of the site. As can be seen this number turns out to be 2,794,444.6 NIS. This can be considered as the use value of the reserve.

## **6. Applying the CVM to the Rosh Haniqra Marine reserve:**

In this study we used a payment card method as a tool of payment. According to the NOAA panel it is the second most recommended type of payment vehicle after the dichotomies payment method. However, payment card method has a substantial advantage in that it does not require a personal one on one fill out emphasizes. It also requires fewer participants in the survey. Due to budget limits it was decided to stick to the payment card. The questionnaire itself is presented in appendix 1.

Further, in order to meet NOAA recommendations for a CVM to be applicable we chose two calibration tests. This is besides the socio-demographic tests which are

to be examined for the expected sign of the regression coefficient. Our two calibration tests are the range of payment possibilities and representative specie for the reserve.

As for the range we divided the questionnaires to two types. Up to 110 NIS and up to 220 NIS. We expect the mean WTP to be the same otherwise we could conclude that we have detected a scale problem (people target themselves to the middle which is higher in the second type of questionnaire).

As for the type of specie we divided the questionnaires into two types again. In the first type we have asked about the WTP to prevent the extinction of the Sea turtle. In the second type of questionnaire we have asked people about their WTP to revive the Mediterranean Monk Seal. The last one is extinct specie already while the former still exist but is endangered specie.

### **6.1 The Mediterranean Monk Seal and *Caretta caretta* (Brawn Sea Turtle):**

The Rosh Haniqra aquatic area is characterized with unique and diverse flora and fauna, which has been threatened for the last decades by human activity. Unfortunately, we cannot portray the entire spices or the variety of plants, which have been affected, hence affects total welfare. Therefore two representative spices were chosen to illustrate the maintenance of the resource level and demonstrate the variety ecosystem: the Mediterranean Monk Seal (figure 5) and *Caretta caretta* (Brawn Sea Turtle) (figure 6).

Both the Mediterranean Monk Seal and *Curette caretta* (Brawn Sea Turtle) stand at the top of the food chain and both habitats surround the seashore and the sea itself and had been affected badly by human activity. In fact the Monk Seal has not been being seen in the region since the 70's.

**Figure 5: The Mediterranean Monk Seal**



The Mediterranean monk seal is coastal specie. Most monk seals are found on two types of coasts: archipelagoes, especially those with small islands, often uninhabitable by man because of water shortage; and cliff bound mainland coastlines. Historical descriptions show that the use of beaches was normal until the 18th century. It eats fish and octopus. Most Mediterranean monk seals are concentrated in small colonies of up to 20 individuals. It apparently used to live in much larger colonies<sup>6</sup>.

The Mediterranean monk seal used to be abundant specie. Hunting for its skin prior to this century reduced the population sharply. By 1966 it had been reduced to 20 - 30 small colonies scattered throughout its original range. More recently, persecution by fishermen and disturbance of the seals' last remaining refuges (caves with submarine entrances) by skin-divers are the greatest threats.

**Figure 6: *Caretta caretta* (Brawn Sea Turtle)**



The *Caretta caretta* (Brawn Sea Turtle) is classified as threatened specie. Fully developed Brawn Sea Turtle weigh up to 350 pounds and have a golden-brown carapace (upper shell), which is the source for its name, and a dull brown to yellow plastron (lower shell). An Adult Brawn Sea Turtle 's carapace is normally 82 to 105cm long. Brawn Sea Turtle are primarily carnivorous and feed mostly on shellfish that live on the bottom of the ocean like: horseshoe crabs, clams, mussels, and other invertebrates. Their powerful jaw muscles help them to easily crush the shellfish. Brawn Sea Turtle lay eggs at intervals of 2, 3, or more years. Nesting season runs from May through September. The average number of eggs in each clutch varies from 100 to 126, and the eggs incubate for about 60 days. Brawn Sea Turtle nesting is

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<sup>6</sup> P.Massicot; Last modified: July 13, 2004; © 1999 - 2004 Animal Info  
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concentrated in two main areas of the world: in the Middle East and on the coast of the southeastern United States.

Sea turtle populations have been seriously reduced worldwide through a number of human influences. Over-developed coastal areas have been claimed to be responsible for a reduced natural nesting habitats. Capture of adult turtles for eggs, meat, leather, and tortoise shell caused a decreased in the breeding populations. Finally, Incidental capture of adults in fishing nets and shrimp trawls are considered as another reason for their declining number.

## **6.2 Threats and Reasons for Decline:**

In the past, hunting for skins was the main reason for its decline. More recently, persecution by fishermen and disturbance of the seal's last remaining refuges (caves with submarine entrances) by skin-divers are the greatest threats. Furthermore, breeding in caves, instead of open beaches, seems to be unsuitable for the monk seal and to result in a higher mortality of pups.

The Mediterranean monk seal is very sensitive to disturbance, especially pregnant females that will often abort when disturbed. It is also vulnerable due to its long lactation period and the pup's dependence on its mother during this time. The pup-mother bond can be easily broken, especially during the first 3-4 weeks after birth. Recreational hunting is generally not a major problem (*Israels 1992*<sup>7</sup>).

In our study the hypothesis was that social welfare is to increase when the probability of the Monk Seal to appear again will increase. Same reasoning goes with respect to the Brown Turtle. The increased probability of the extinction will reduce social welfare.

## **6.3 CVM questionnaire design and Results:**

Random samples of 200 visitors along the Rush Haniqra - Achziv beach were surveyed and asked about their socio-demographic characteristics and about their

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<sup>7</sup> Israels, L.D.E. 1992. Thirty years of Mediterranean monk seal protection, a review. Neth. Comm. Intl. Nature Prot. 28.

willingness to contribute annually to a fund exclusively targeted to save the Curette (brawn turtle) or rehabilitate the Mediterranean monk seal, as an expression to preservation the coastline. As explained earlier, these two reprehensive species can be an accurate sample for the uniqueness of the site. The survey dealt with two type of species in order to examine that there are no deviation problems due to the type of specie.

Prior to the actual field survey, pre-surveys were given to focus groups to ensure that respondents understood what in fact was being asked of them. Application of the field surveying was undertaken face-to-face. Before asked of their WTP, respondents were<sup>8, 9, 10</sup>:

- Note the importance of this coastline as a natural habitat and as a unique landscape and the fact that there is an environmental program on the ballot.
- Told that the Curette (brawn turtle) and the monk seal represent the whole flora and fauna at the coastline.
- Informed of scenario that accurately and understandably describes the expected effect of this program.
- Reminded that a willingness to pay for the program will reduce the amount they would have available to spend on other things including other environmental goals.
- Being asked about the reasons for them answer. The suggested reasons were included market values, non-market values, use values, non-use values and negative reasons.

The sample characteristics reveal that more women answered then men, most of the respondents were singles; the majority had academic education and most had income below the average level; the average age group was between 18-25; only few were members in an environmental organization. However, as we shall see when we analyze the willingness to pay and its causes, the characteristics of the respondents did not affect the willingness to contribute to the environmental cause.

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<sup>8</sup> P.R. Portney, 1994. The Contingent Valuation Debate: Why Economists Should Care, The Journal of Economic Perspectives. Vol. 8. Issue 4. 3-17

<sup>9</sup> EPA.2002." A Framework for the Economic Assessment of Ecological Benefits"; 2.

<sup>10</sup> World Bank Institute, 2002, Environmental Economics and Development Policy Course, July 15-26, session 28.

The surveys were taken in the beginning of the recreation season, during the week and on the weekends and holidays along the beach. This variety of time categories enables us to assume that the random sample of responders represents the actual visitors to the coast profile.

Two types of multiple payment choices were given randomly to the respondents to reduce bias and redoubled the reliability of the results: 0-125 NIS and 0-220 NIS. The scope and divide of the payment choice may be being formed tilt<sup>11</sup>, since people tend to choose mid-values. Significant difference were not being found (T- tests) between the questionnaires types or between the monk seal questionnaires and the brown turtle questionnaires, therefore the follow-up analysis were examined as one type survey.

Some controversies with respect to the CVM are connected with accuracy of the answers. For example people's willingness to pay may increase if they are asked to save 'cute' animal like Monk Seal and decrease when they asked about reptile or amphibian like the Curotte (brown turtle).

Nevertheless, embedding or part-whole bias has been difficult valuation phenomenon. Embedding means that the value of a good is smaller if it is offered late in a sequence than when it is first or alone<sup>12</sup>. Thus, embedding can be minimized by careful plan of the CV tool. In this study the respondents are asked to name other recreation site, parks or reserves in the area with similar quality that the visitors had or expected to experience in this trip. This should remind the respondents about their budget constraint.

Contingent valuation studies sometimes produce zero WTP values and a few implausibility large values. Zero values may indicate strategic behavior of attempts to misrepresent the WTP by the respondent in order to influence the outcome of the survey or may represent protest bids including respondents who think that they should not have paid for the goods even though they have positive WTP for it. Relatively large WTP values may be evidence to strategic behavior or that the respondent failed to consider carefully his budget. The distributions of responses to the contribution fund question are presented in Figures 7 below. 17 responses were not included due

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<sup>11</sup> Kahneman D. and Knetsch, J.L., 1992. Valuating Public Goods the Purchase of normal satisfaction. *Journal Environment Economic Management* 14; 226-247.

<sup>12</sup> Navrud S. and E.D. Mungatana 1994. Environmental Valuation in Developing Countries: The Recreational Value of Wildlife Viewing. *Ecological Economics* 11; 135-151.

to unreasonable, extreme responses, data recording, etc. The total number of valid responses is therefore 183.

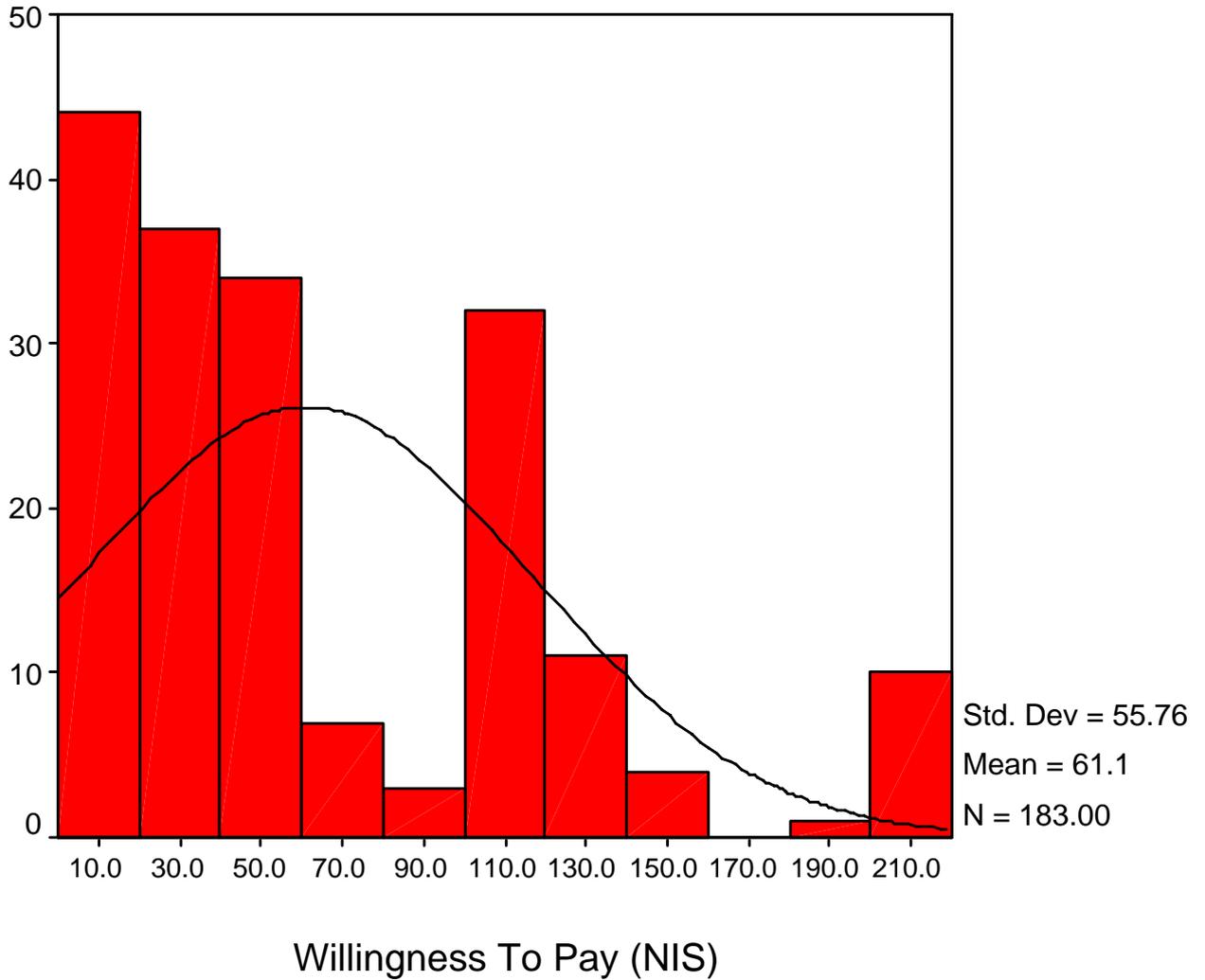
The mean WTP was 61.1 NIS, the mode and median were 50 NIS and the standard deviation 55.17.

As can be seen from figure 7, two peaks characterize the bar charts: one between 0-20 and the other between 100-120. The bar charts decline slightly from 0 to 60 and then the number of people who are willing to pay 60-100 NIS fall sharply to less than 10. Between 100-120 the bar charts increase dramatically and reach another peak..

Although most of the responders are willing to pay less than 60 NIS to the environmental fund for the next 10 years (the mode and median was 50 NIS), taking the 50 NIS as a typical household willingness to pay will exclude the second peak and a large number of respondents. Moreover it ignores the curve inclination to the right.

In valuation studies, the mean WTP is more economically sound while the median is more in line with the democratic way of thinking (at least 50% would vote for that amount). We can safely conclude that the estimated willingness to pay per household is between 50-61 NIS.

**Figure 7: Chart bar of WTP distribution**



The responses of WTP for annual contribution to the monk seal / turtle fund were regressed on the socio-demographic variables listed in Table 5 according to both linear and semi-log equations:

**Table 5: Variables included in the CVM regression:**

**Variable (units of measurement)**

- AGE (years)
- GENDER (M/F)
- COUNTRY - country of origin (*Israel, Jordan, or Palestine/ Middle East/ Europe/ North America/ Other*)
- PERSONAL STATUS - (married/ married with children/ single/ divorce/ widower)
- CHILDREN (number)
- ENVIRONMENT - membership in an environmental organization (*Yes/No*)
- EDUCATION (*elementary/ high school/ professional / academic*)
- INCOME (*in local currency, later converted to US\$*)
- VISIT (number)

The most reliable regression was found to be the linear one. In a step-wise regression it was found out that only the variable VISITS is significant at the 95% significance level. The WTP regression can be thus written as (4):

$$(4) \quad WTP = 56.35 + 0.177(VISITS)$$

Thus, people are willing to pay more when the environmental benefit were familiar to them<sup>13</sup>.

To compute the total benefits of coastal reserve is done usually by multiplying the mean WTP (61 NIS) by size of the relevant population affected by this program. As an alternative, we estimate the median WTP, which provides robust lower bound for mean WTP and is less sensitive to skewed distributions and the presence of gross outliers.

All of the respondents were Israelis and most of them arrived from the nearby regions. For these people the research site was well known and the research question was not a hypothetical question. Dealing with population whose members are quite interested in the issue discussed in the survey, the response rate tend to be high

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<sup>13</sup> J.A. Dixon, S. Pagiola, and P. Agostini, 1998, Valuing The Invaluable: Approaches and Applications.

(93.5% in this study) and the generalization to this ‘homogeneous’ population is quite good<sup>14</sup>. Furthermore the reliability of the answer in this case is high as well.

Therefore this study defined the beneficiary population as the number of households in the northern part of Israel: 1,148,000 households.

The total benefit is therefore:

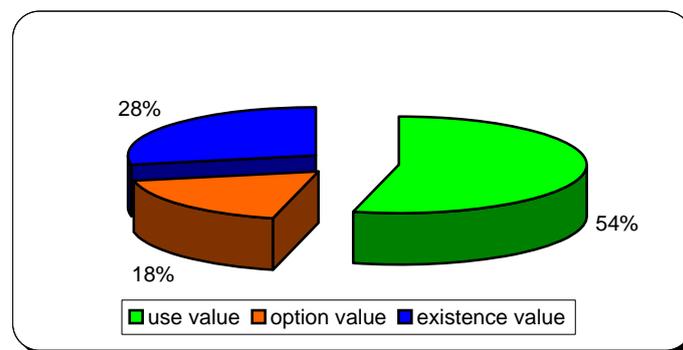
$$61(\text{mean}) * 1,148,000(\text{households}) = 70,028,000 \text{ NIS}$$

Or alternatively:

$$50(\text{median}) * 1,148,000(\text{households}) = 57,400,000 \text{ NIS.}$$

57-70 million NIS is a lower bound since the beneficiary population is probably larger and includes visitors from other parts of Israel and foreign tourists. Breaking down the total value to its Use and Non-Use can be seen in figure 9. As can be seen the use value is about 54% of the total value. That means about 31 – 38 million NIS.

**Figure 8: Use and Non-Use values**



## **7. A Managerial application – The seaside road:**

As an example to a management strategy we consider now the closed seaside road. This road can be accessed only with admission fee. Pricing such facilities can serve different goals: revenues, carrying capacity etc. Since we don't have at the moment the necessary information on the carrying capacity, we consider only revenues vs. Efficiency.

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<sup>14</sup> J.B. Loomis, 1987, Expanding Benefit Estimates, Land Economics Vol 63. No. 4.

Without carrying capacity problems the efficient admission price to a public good facility is zero. However in times of budget constraints, we might examine situations in which governmental agencies should cover their own costs. Further, we might think of a situation in which they should maximize their revenues (probably to cross subsidize other sites). In the following short analysis we demonstrate how we trace the tradeoff between revenues and efficiency. Other goals such as carrying capacity and covering costs can be included in a straightforward way.

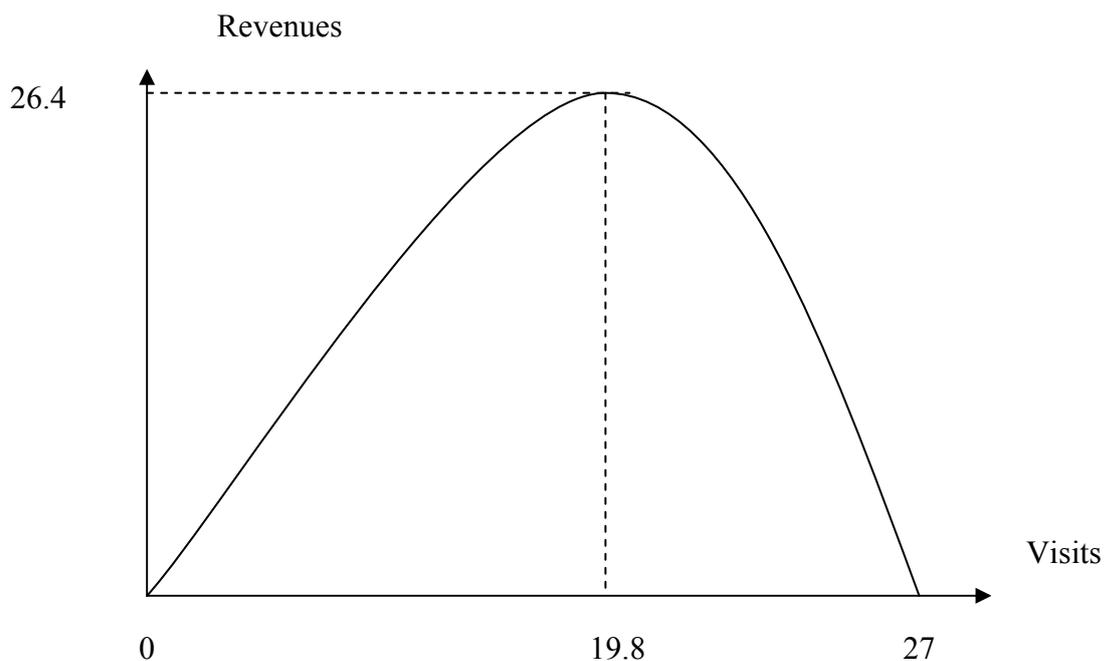
Starting from Fig. 4, the demand function, it represents the marginal benefit of the site. From that we can integrate to find the total benefit of the site. The marginal and total benefit functions are given in the following equations respectively:

$$(5) \quad P = 325 - 0.002(V)$$

$$(6) \quad TB = 325(V) - 0.000004(V)^2$$

In figure 9 we can see the trade-off, based on the admission price simulation, between efficiency and revenues.

**Figure 9: Tradeoff between revenues and efficiency**  
**(in m. NIS)**



As can be seen from figure 9, the most efficient price is zero. However, it raises no revenues. Starting to raise the admission price causes a decrease in the number of visitors and raises revenues. Because the demand function is linear and benefit quadratic we get an hyperbolic graph. The maximum revenue is achieved at 26.4 M. NIS at an admission price of 162.5. That causes however a drop of 81,500 visitors which in turn reduces the total benefit of the reserve from 27 M. NIS to 19.8 M. NIS.

Please note that we included ALL visitors in the region in the demand function. However this is of course an over estimation. A more likely figure of 25% would be more accurate. Other goals such as covering costs (not known at the moment) or meeting some carrying capacity targets (same) can be easily tested with such simulations.

## **8. Summary:**

This report tries to estimate the different values of the proposed RHMR. This is based on mapping the different stakeholders and their derived benefits. In order to achieve that, two surveys were used. A public survey about the willingness to preserve the environment and the visitors profile and a commercial survey which was distributed to existing facility owners at the region.

It was found out that the use value only exceeds the commercial value of the site. However, this study was done for the entire reserve. In order to be more accurate, one should look for intermediate results such as closing and restricting only parts of the reserve to different uses. To achieve this goal, we have listed a priority list of environmental sensitivity conflicts in the region. This should be the topic of a future research in which carrying capacity for the specific use should be estimated by ecologists and then use this result as a starting point for management scenarios. An example is given by analyzing the proposed tourism road along the seaside.

Over all it was found out that the total value of the site is more than 50 Million NIS. Out of that about half are associated with direct use values. This number is large enough to justify a more detailed analysis to propose a management plan for the marine reserve.

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## **Appendix 1: The Public questionnaire**

Dear visitor,

The European Union and the Israeli Nature and Parks Authority with the cooperation of Tel Aviv University, Israel Oceanographic and Limnological Research, Haifa University and Tel Hai College conduct a research on the economic and ecological value of the Rosh – Haniqra – Achziv Coastline. We would be thankful if we could draw your attention to read the follows and answer the subsequent questions. All the answers will be exclusively for this research only and the questionnaire confidentiality is assured.

The northern Israeli coastline, which extends between Nahariya and Rosh Haniqra, is one of the most unique and diversified aquatic areas due to its geomorphology, heritage sites, flora and fauna. The diverse morphology at the coastline is claimed to be responsible for a variety of landscape phenomena: limestone, sand and shallow lagoons. Many species inhabit at the aquatic coastline near the beach and even Mediterranean Monk Seal used to live there.

The State of Israel in cooperation with the EU is very much interested to study the value of this coastline between Achziv and Rosh Haniqra as a marine reserve. The nature and nature lovers will benefit from the preserve. However, there are resources required for this preservation effort and without the public's opinion to be positive about that effort it is doubtful that the preservation efforts will be carried.

The Rosh Haniqra coastline is characterized with unique and diverse flora and fauna, Unfortunately; we cannot measure the entire species or the variety of plants, on the total welfare. Therefore Mediterranean Monk Seal has been chosen to illustrate the maintenance of the resource level and demonstrate the variety of the marine ecosystem. Please, remember that the Mediterranean Monk Seal is simply an illustration of the variety marine life at the proposed marine reserve.

The Mediterranean Monk Seal was given that name due to its dark cap and white belly. It was the single Pinnipedia inhabiting along the Israeli coast. Until the late 1970's Mediterranean Monk Seal colonies were still present along the seashores. The Mediterranean Monk Seal had been being affected badly by human activity; in fact the

Monk Seal has not been being seen in the region since the 70's. Some of the main causes that affect the Mediterranean Monk Seal population:

- ❖ Hunting for its skin
- ❖ Persecution by fishermen and disturbance by skin-divers.
- ❖ Breeding in caves, instead of open beaches, seems to be unsuitable for the monk seal and to result in a higher mortality of pups.
- ❖ The Mediterranean monk seal is a very sensitive to disturbance, especially the pup's dependence on its mother during the lactation period time. The pup-mother bond can be easily broken, especially during the first 6-8 weeks after birth.
- ❖ The continuing decreases of fish numbers in the Mediterranean.

These reasons and others had caused to the extinction of the Mediterranean monk seal and to its disappearance at our coasts.

The Mediterranean monk seal had been declared by the IUCN as a critically extinction danger species. Several countries along the Mediterranean had been legislating laws and establish plans to save the Mediterranean monk seal. These campaigns may increase your chances to meet monk seal along the beach.

However, These plans require monetary investments and without adequate support it will have no justification to be carried out.

In order to estimate the benefit from reserving the Mediterranean monk seal population we would like to ask you to please answer the following question:

**Suppose there was a closed environmental fund where all of its revenues were to be directed to the single goal of saving the Mediterranean monk seal. This fund would be active for the next 10 years. What would be the maximum yearly amount that you will be willing to contribute in favor of such fund which will enable to observe monk seals along the beach? Please think carefully of your answer within the framework of your income. Also you might want to consider other environmental causes you might wish to contribute too. We therefore ask you to consider ONLY the pure payment for that cause only.**



1	15	40	
2	18	45	90
3	20	50	98
5	23	55	100
7	25	60	105
10	27	65	110
12	30	70	120
	33	75	125
	35	80	Other _____

Thank you! Now, would you be kind enough to answer the next few questions.

**The main reasons for choosing this amount are (please mark one or more reasons):**

- ❖ It's important to protect the Mediterranean monk seal because I would like to visit and see them in the future.
- ❖ It's important to assure the Mediterranean monk seal existence at the Mediterranean coasts.
- ❖ I would like to save the Mediterranean monk seal in order to maintain the marine and coastal environment.
- ❖ I would like to save the Mediterranean monk seal for the enjoyment of future generations.
- ❖ I have no interest in saving the Mediterranean monk seal.
- ❖ This amount is reasonable for this cause.
- ❖ Someone else should pay rather than me
- ❖ I would like to save the option to observe the Mediterranean monk seal in the future although I do not intend to visit there at the moment.
- ❖ Other \_\_\_\_\_.

We thank you for your honest reply.

**To help us evaluate your answer we would like to ask you now a few questions about yourself (all questionnaires are strictly confidential and are not given to any external body):**

1. Age \_\_\_\_\_
2. Male/Female
3. Family status: a. bachelor b. married c. married with children d. divorce  
e. widow.
4. No. Of children \_\_\_\_\_.
5. Do you use to visit this coast \_\_\_\_\_ time a year.
6. On this trip are you going to visit anther sites?  
1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_
7. Do you live in an urban or suburban area? \_\_\_Yes / No\_\_\_\_\_
8. Are you a member of an environmental organization? Please name it  
\_\_\_\_\_
9. Have you heard about this subject before? A. No. B. Yes, from the media  
c. I had studied/engaged in this filed.
10. Education completed a. elementary b. high school c. professional  
d. academic
11. Country of origin \_\_\_\_\_
12. Your place of residency in Israel \_\_\_\_\_
13. Mode of transportation to get to the site \_\_\_\_\_
14. The average income in Israel is about 10,000 NIS per household. Is your  
income?  
a. Below average b. average c. above average d. much above average

Thank you and have a wonderful day.

## **Appendix 2: The Commercial questionnaire**

Hello,

Following our phone conversation I would appreciate if you could fill out the attached survey and return it to us. Of course all the information gathered in this research is kept confidential and will be used only for research purposes.

**Name of facility** \_\_\_\_\_

**Your role in the facility** \_\_\_\_\_

**Type of Coast and Marine uses. Main attractions:**

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**Number of visitors (including seasonal trending and week/weekend and domestic/ foreign visitors):**

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**Visitors forecast into the future under peace conditions**

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**Changes in operation cost due to changes in amount of visitors:**

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**Future forecast, includes investment and other planned uses**

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**Main Competitors and their location**

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**Number of employees and their type (tenured, seasonal, academic, professionals and a like)**

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**Origin of employees**

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**Is the facility private or public?** \_\_\_\_\_

**Ratio of employment and revenue to the number of visitors (e.g., for every 1000 visitors there will be 1 more employee and the revenue will increase by 50K NIS)**

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**Are there any restrictions on the beach and the sea itself that serve as constraints to your business?**

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**Sensitivity of your facility to security situation**

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**Annual estimate of revenue**

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**Does the government helps in some way (tax deductions, subsidies etc.)**

**We thank you in advance and wish you a pleasant day.**