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Forecasting the Number of Visitors in a Unique Recreational Site- A Retrospective View

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Abstract

We examine in the research forecasts prepared by us fifteen years ago. We examine the assumptions made as well as the results, comparing the forecasts to reality. We concentrate on the forecasts of number of visitors, which enables to examine economic impact, and is crucial in analyzing ecological carrying capacity.

Our case study was a wetland that was drained in the '50s, resulting in severe environmental damages. In the '90s part of the area was re-flooded and a small lake was created. We forecasted the number of visitors, the expected revenues and benefits. The area is currently called Agmon Hula, located in the previous Hula marsh (North of Israel).

The commodity planned was a site which offers safari, birds' sanctuary, horse riding, swimming in a pool, picnicking. We asked recreationists in adjacent national parks and nature reserves on their willingness to visit the planned park and their willingness to pay (WTP), using CVM methods. In reality, the site started operation in 2005 as a birds' sanctuary, due to its success in attracting birds. 500 million birds pass the area twice per year migrating to the south in the fall and returning north in the spring. Our forecast for 380 thousand visitors in the first year of operation did not materialize. We could have predicted a smaller number closer to the real number (220 thousand) if we would have considered the percentage that ranked birds' sanctuary as one of their two favorite activities.

The prediction assumed an annual increase in the number of visitors of 2-6%, but actually, the increase in the first five years of operation is 8% annually. In the prediction, we disregarded tourists, but they were 7-17% of the visitors. Updating the prediction of number of visitors is easy, and is a crucial aspect in predicting carrying capacity.

Introduction

Very often economists are expected to forecast the impact of projects, whether in economic terms i.e., revenues, profits, costs, or some other terms, in this case the number of visitors in a recreational site. As time passes, the forecasts may materialize or be found wrong. We examine in the paper forecasts prepared by us fifteen years ago (Baron, Zaitsev, Shechter, 1997). We examine the assumptions made as well as the results, comparing the forecasts to reality.

In the mid '90s we were asked to evaluate the impact of a planned recreational project. The contribution of the project was based on its effect on environmental quality, as discussed below, but our emphasis was in predicting the expected number of visitors in the site, the economic and social benefits and its regional impacts.

In this work, we concentrate on the forecasts of the number of visitors. These values enabled us to examine economic impact, but it is very meaningful in analyzing ecological carrying capacity.

We start in Section 1 by describing the background of the Hula Project. In Section 2 we describe the recreational patterns in the Galilee area, since the Project is part of the area. In Section 3 we explain how we prepared forecasts in 1996, what were the assumptions used, and the results of our forecasts. In Section 4, we discuss in retrospect our assumptions, and compare the forecasts to the reality. Section 5 summarizes the results and discusses where we could and how update the forecasts.

1. Background

In the early 1950's the Hula, a wetland in the Upper Galilee (in Northern Israel) was drained. It was hoped that besides solving the environmental ill effects of mosquitoes, it would provide many jobs in agriculture. After forty years it was clear that the solution of one environmental problem created others, not less severe. The drainage resulted in a global loss of seven animal species out of 12 that were endemic. In terms of the region, 119 species were not recorded in the region after the drainage (Safriel, 1997, pp. 22-23).

The environmental problems encountered include nitrification of Lake Kinneret, the main source of drinking water in Israel. The deterioration of land, caused agriculture to become not profitable, and employment opportunities in the region decreased. In the peat areas spontaneous fires were common as well as sand winds.

In 1994 part of the previous wetland was re-flooded. Canals were dug, an artificial lake was recreated and as a result the water level in the peat areas rose, preventing the spontaneous fires and sand winds. Shortly after re-flooding (in 1996) the number of bird species increased to 153. Altogether, 95,000 birds were recorded in 1996 (Oron and Shai, 1997) and the number of the recorded birds keeps increasing. It is estimated that in 2010 500 million birds passed the area including pelicans, storks and cranes among many other birds.

In the 90s it was suggested that the recreated marsh, referred then as Hula Project, and referred now as Agmon Hula, will become a safari, birds' sanctuary, and an area for recreational activities. The government covered the costs of re-flooding the area, in order to stop nitrification of Lake Kinneret, however the question we faced was can the area turn into a recreational attraction. How many visitors will be attracted to the place and what will be the revenues and social benefits of the site.

2. Recreational Patterns in the Upper Galilee

The Upper Galilee area is characterized by different attractions: nature reserves, national parks, archeological sites, forests etc. The area is attractive to Israeli recreationists who enjoy the abundance of water and the region's unique characteristics. The Israeli recreation is characterized by day-visits, and staying overnight is relatively a new phenomenon increasing in popularity. The tourists who visit the area are mostly attracted to an archeological site, the Banias Reserve, and do not stay overnight in the area.

In the period 1994-99 the five major recreation sites in the Upper Galilee region attracted 600-690 thousand Israeli recreationists, and 160-190 thousand tourists. In 2004-2009 the same five major sites attracted 690-1035 thousand, of them 81-285 thousand tourists (see Table 2 surveys' sites). The number recorded is actually of visits and not visitors. Some of the visitors were counted more than once (visiting a few parks and recorded a few times in the same visit, if moving from one park to another, or on different visits in the same year). Despite the inaccuracy, we cannot separate between visits and visitors, and we shall use both terms (visitors and visits) interchangeably.

We studied the recreational patterns in the area, and interviewed recreationists in the major parks in different periods in 1995-96 (four different seasons). The effective size of the entire sample was

800 observations. An important issue was the reaction to a planned new park, the Hula Project in terms of willingness to visit and to pay.

3. Expected Demand for a New Park the Agmon Hula (Hula Project)

3.1. Willingness to Visit

Forecasting future visits in the Hula Project (currently termed Agmon Hula) was based on hypothetical questions about willingness to visit. To clarify the hypothetical 'commodity', the questionnaire described the main features of the proposed park: artificial lake, safari park, birds' sanctuary, etc., and then asked respondents to indicate their willingness to visit such a park.

Asked about the Project (the "planned" Agmon Hula), 87% of the interviewees responded positively, 12% were not sure or did not know, and only less than 1% of the respondents answered negatively. Given the number of visitors to parks in the Upper Galilee (we assumed 0.7 million visits in 1995), our forecast was that with no entrance fees, if these intentions were realized, they might result in 600,000 visitors to the park.

We also asked about the willingness to participate in individual activities (each person was asked for the two most attractive activities). The most popular ones are visiting a birds' sanctuary, visiting a safari and rowing a boat on a lake. Each of these three activities attracted more than 40% of the interviewees depending on the season. Activities which are not unique to the site did not attract visitors, e.g., swimming in a pool, picnicking, attracted less than 20%.

These results should not be accepted literally, as one would expect a discrepancy between intentions, which do not involve an actual commitment and allocation of time and money resources, and realization. The results do indicate, however, a large potential demand that could be realized, at least in part, through proper marketing.

3.2. WTP Entrance Fee

In order to learn about the demand function for the site and the expected revenues and benefits, we used Contingent Valuation Method (CVM, see Mitchell and Carson, 1989, Garrod and Willis, 1999) to see how sensitive the demand to the entrance fee is. In our surveys, interviewees were induced to state the maximum sum of money (their Willingness To Pay, WTP) they would be willing to pay as an entrance fee to the Hula park, as if they were able to

‘purchase’ the park’s amenities on a hypothetical market. In eliciting WTP, the first steps are to describe the hypothetical commodity and the ‘bid vehicle’ of collecting payment. After describing the planned park, the commodity (see above), interviewees were asked about their willingness to pay an entrance fee per adult.

3.3. Expected Number of Visitors of the Project as of 1995

We assumed that the entrance fee will be NIS 30, and forecasted that 380,000 visitors will visit the park in the first year of operation. This number is expected to increase in future years, as discussed below.

The expected benefits were derived from the WTP elicitation that enabled to estimate the demand curve for the park.

We estimate that in the ‘base year’ the revenues to the entrepreneurs will be NIS 11.4 million, based on the total number of visitors (380,000) and the entrance fee (NIS 30) which equals in 1997 exchange rate to \$3.8 million. The area under the demand curve, which measures the total revenues to the entrepreneurs plus the consumers’ surplus measures the benefits to consumers would be NIS 14.1 million (equals to \$4.7 million). We shall discuss only the revenues (80% of the total benefits). For details see Baron, Zaitsev and Shechter (1997).

We are not concerned with the revenues in a single year, but over a longer period, since the park is expected to generate revenues over a period of twenty five years.

To translate the base year values into present value of expected revenues we use the following assumptions:

1. An annual increase in the number of visitors and in revenues by 2, 4 and 6%, alternatively (reflecting the increase in the size of population, income levels and leisure time).
2. All the calculations refer only to Israeli visitors, disregarding overseas tourists.
3. All the calculations are performed assuming that the political situation remains unchanged. Peace relations with Lebanon and Syria will probably attract visitors from these countries to

Upper Galilee due to the proximity, and will probably increase the overall number of tourists.

It will also affect the behavior of Israeli visitors who avoid the region in periods of tension.

4. The real interest rate is assumed alternatively as 5, 8, and 10 % in real terms.

5. We assume 25 years of operation.

We predicted that in ten years the number of visitors will be between 455-680 thousands. The range varies according to the annual change in visitors (Assumption 1). The present value of revenues ranges between 123 million and 324 million, according to Assumption 1 and the real interest rate, Assumption 4, see Table 1.

Table 1. Expected Revenues of the Hula Project under Alternative Assumptions (NIS millions)

Real Interest Rates	2% Increase of Visitors	4% Increase of Visitors	6% Increase of Visitors
5%	200.1	252.7	323.9
8%	147.5	181.5	225.8
10%	123.0	146.1	182.7

The present value of consumer surplus (not presented here) is calculated as well. The expected revenues have to be compared with the investment in the construction of the recreational facilities and their expected maintenance costs. If the net present value is positive, it means that the entrepreneurs will have profits. The recreational benefits, and especially the consumers' surplus, provide an additional justification to the government's expenditure on the construction of the canals and the artificial lake. Although, the government's investment was justified by preventing environmental degradation, as discussed.

4. Calculating the Number of Visitors from 2005

The Agmon Hula was opened for visitors in its current state in 2005 (a few years later than expected).

The product developed (the Agmon Hula) diverges from the plans. Currently, the Agmon Hula is functioning mostly as a birds' sanctuary. Its location on the migration route of birds makes the site most attractive to birds' watching. It is estimated that 500 million birds pass through the area in their migration to Africa and back. One of the characteristics of the place in the autumn and winter seasons are cranes. Since the site is adjacent to agricultural fields the cranes stay there to 'fuel' themselves as a stop between Europe and Africa. The availability of food made it attractive for cranes to winter on site. In November 2010 40 thousand cranes were counted in the site and in January 2011 31 thousand cranes were counted wintering on site. The cranes became a subject of dispute between the farmers and the environmentalists. Ideally, just 15 thousand will stay there for the winter, but this objective is not achieved every year. The dispute is whetherto feed the cranes, and who pays for their food.

Our forecast was that 380,000 visitors will come on the base year. However, just 230,000 Israelis visited in the first year of operation, 2005, less then 60% of our forecast (the number of visitors includes Israeli visitors who paid and visitors who did not pay, an extra 30%, see Table 2). The hypothetical commodity presented is very different from the actual commodity. We had data on the reaction of visitors to single activities, but we have not used this information. We could have predicted that if the park will be just birds' sanctuary, it will attract 50% of the visitors since 50% of the interviewees responded that watching birds is one (of two) of their most favorite activities.

We calculated entrance fees based on WTP questions. Currently, there is no entrance fee charged. Jewish National Fund (Keren Kayemeth LeIsrael), which manages the site, does not allow charging entrance fees. Concessionaires charge fees for services, mostly for transportation within the park. Entrance is free only on foot or with bikes over weekdays. Since the park is large, and the trails spread over 8.5 km, about 70 percent of the visitors pay for a mode of transportation (bikes, carriages, etc; cars are not allowed in the park).

The mean payment is currently around NIS 30, the amount we assumed as an entrance fee.

Looking on the results in retrospect requires that we update the numbers of the base year, and update the assumptions in predicting the number of visitors.

Let us discuss the assumptions used.

Assumption 1. Looking at the number of Israelis visiting nature reserves and national parks in the period 2004-2009, the annual increase in visits is 6.8%, above the range of growth rates in assumption 1 (2,4,6% annual increase). Since the number of visitors is crucial due to limitations on carrying capacity; to predict the demand for accommodation, etc. We have to emphasize this forecast.

Table 2. Visitors (thousands) in Northern District, Survey's Sites and Agmon Hula

	2004	2005	2006	2007	2008	2009	2010(I-IX)
Northern District-total	1760.0	1764.8	1656.2	1906.6	2128.1	2130.6	2174.1
% change		0.27	-6.15	15.11	11.61	0.11	
Tourists	111.4	190.0	209.3	277.3	384.5	302.5	291.0
% change		70.55	10.15	32.48	38.65	-21.32	
Israelis	1648.6	1574.8	1466.9	1629.3	1743.6	1828.1	1883.1
% change		-4.47	-6.85	11.07	7.015	4.84	
Survey's sites - total	689.1	724.0	753.7	856.1	905.9	906.1	1035.4
% change		5.06	4.10	13.58	5.81	0.02	
Tourists	81.3	143.2	157.8	206.0	284.6	213.2	206.3
% change		76.13	10.19	30.54	38.15	-25.08	
Israelis	607.8	580.8	595.9	650.1	621.3	693.1	829.1
% change		-4.44	2.59	5.57	-1.25	10.34	19.63
Agmon Hula		184.0	208.7	250.9	259.7	279.7	317.0*
Total, paid for services							
% change			13.43	20.21	3.52	7.71	13.29*
% from Northern district		10.42	12.60	13.16	12.20	13.13	Not available
Tourists (7% from total)		12.8	14.6	17.5	18.1	19.5	53.8**
Israelis		171.1	194.1	233.3	241.5	260.2	263.1*
Estimate of visitors who don't pay (30% from Israelis)		51.33	58.23	70.0	72.45	78.06	78.9*

* For entire 2010

** 17% from total number in 2010

Sources: Central Bureau of Statistics, *Tourism and Hotel Services Statistics Quarterly*, 2006 - 2010, and Mr. Kobi Samrano, Agmon Hula

Assumption 2. All the calculations refer only to Israeli visitors, disregarding overseas tourists; this ignores the tourists increasing contribution in terms of percentage of visitors and correspondingly of revenues. Tourists comprised 7% of the total visitors of Agmon Hula, in the

period 2005-2009, and increased to 17% in 2010. Tourists' number in the nature reserves of the Upper Galilee ranges between 111 thousand in 2004 and 384 in 2008 (see Table 2).

Looking at the number of tourists visiting the nature reserves and national parks in the country, the annual increase in tourist visits is 26%. Assumption 2 that enables to disregard tourists brings to an underestimate of the number of visits. However, the tourists' data is difficult to predict. In 2009, following the global economic crisis, the number of tourists' visits in Northern District decreased in 21%, could we predict such a change?

Assumption 3. All the calculations are performed assuming that the political situation remains unchanged. This is a difficult assumption, but can be justified. In the "Second Lebanon War" which occurred in 2006, the Upper Galilee was the target of rockets and its forests were hit badly. The number of visitors in Northern District parks (see Table 2) decreased in 6.1%, mostly by the decrease of visits of Israelis (decreased in 6.8%). The number of Israelis visiting all the national parks increased in 2006 just in 1% and decreased in 2007 by 1%, relative to around 10% annual increase in other years.

Assumption 4. The real interest rate is assumed alternatively as 5, 8, and 10 % in real terms. Following the economic crisis of 2008 these interest rates seem very high. However, the higher the interest rate the lower the present value of future revenues. An analysis conducted now will have to use lower interest rates.

Assumption 5. Remains unchanged.

5. Discussion and Conclusions

In this research, we compare our forecasts for a recreational project, which were done in 1995-97 with reality, fifteen years later. The task in the 90s was to estimate the benefits from developing recreational attractions in an artificial lake constructed in an effort to abate nitrification of drinking water in Lake Kinneret. The initial plan was to develop there an artificial lake, birds' sanctuary, safari, picnic area, rowing boats in the lake, riding horses, etc. The forecasts were

based on surveys of recreationists in adjacent existing parks and nature reserves performed in 1995-96. The recreationists were asked hypothetical question on their willingness to visit the park and their willingness to pay entrance fees. Based on these answers we calculated the expected number of visitors and the expected revenues and benefits. The program was termed Hula Project, since it is constructed on the Hula marsh in Hula Valley.

The project was not carried out as planned. Currently, it is a birds' sanctuary, which is acclaimed as one of the best attractions in the world for ornithologists. It was opened in its current shape in 2005. Ten years earlier, nobody predicted that flooding the area will return the birds back, and will give the site a global reputation.

Projects are very often examined whether they generate additionality or substitution. If the visits to one park substitute for a visit to another park, then in terms of the social net benefit (the increase on one hand less the decrease) may be positive or negative. If the construction of Agmon Hula decreases the number of visits in existing parks, then the net benefits are dubious. In the case of Agmon Hula (Hula Project) we observe additionality in the region. The Project offers characteristics that are unique and have no substitutes in the region or elsewhere in the country. Since 2005 the number of visitors in the Northern region keeps increasing, except of 2006, the year of the Second Lebanon War. Visitors in Agmon Hula comprise 12-13% of the total number of visitors in the Northern Region nature reserves and parks, and are addition to the region.

Besides the unique characteristics, Agmon Hula has an additional advantage: it contributes in making visits in the region more uniform throughout the year. At the past, the distribution of visits in the region over the year was not uniform and most of the visits were in the summer. Agmon Hula offers attractions that are suitable mostly in the fall and winter. These are months when the birds are abundant, and the microclimate in the park is very comfortable.

In our forecast in 1997 we estimated the impact of the project on employment in the region. We have not updated this forecast. However, since Agmon Hula attracts additional visitors in the

region, and they are spread more evenly over the year, we expect additional employment in the region. Initial results (not discussed in this paper) show more rapid increase in revenues in rural tourism in the region and an increase in occupancy of beds in rural tourism. These are two very important contributions.

Too often, in the process of development, we are facing the dilemma of (economic) development vs. maintaining the environmental assets. This dilemma brought environmentalists to advocate 'sustainable growth'. There are many definitions of 'sustainable growth'. Among the alternatives, we adopt the definition offered by the World Commission on Environment and Development: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). We can argue against this definition that it is too general and does not refer specifically to the environment; however, it balances between present and future generations. The project discussed returned environmental values to the area. If the Agmon Hula will be managed taking care of ecological carrying capacity, then future generation will be able to enjoy the wealth of the site, and we can see a sustainable growth.

The major worry should be the impact of visitors: will they endanger the environmental resources. We expect that with the increase in population, income and leisure, recreation and tourism will become more demanded. Is this becoming an additional threat on the environment? Sustainable development requires that we worry on the environmental capacity of the Hula and the region, and develop policies to limit the number of visitors.

Looking on forecasts retrospectively, as done in this research, shows that if there is a major change in the plan we have to inspect carefully the forecast. We could have analyzed a scenario just of a birds' sanctuary, but we were not optimistic regarding the return of the birds to the region, and did not expect the site to become a magnet for birds and visitors.

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References

Baron, Mira G., Natalia Zaitsev and Mordechai Shechter. 1997. *Expected Economic Benefits of the Hula Project: Economic Analysis*. Haifa: Natural Resources and Environmental Research Center, Haifa University. 63 pp.

Central Bureau of Statistics. *Tourism and Hotel Services Statistics Quarterly*. 20006-2010.

Garrod, Guy and Kenneth G. Willis, *Economic Valuation of the Environment: Methods and Case Studies*, Cheltenham, UK, Edward Elgar, 1999

Kahn, James R., *The Economic Approach to Environmental and Natural Resources*. Orlando, FL: Dryden Press, second edition, 1998.

Mitchell, R.C. and Carson, R.T., 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Resources for the Future.

Oron T. and Shai, A., 1997, "The Return of the Birds", *Research Works in the Hula Project*, MIGAL. Kiryat Shmona, pp. 150-156 (in Hebrew).

Safriel, U. N., 1997, "Problems and Long Term Goals of Conservation of Biodiversity in Israel", Mimeograph, Institute for Desert Research, Ben-Gurion University of the Negev.

WCED (World Commission on Environment and Development). *Our Common Future*, NY: Oxford University Press, Third Publication, 1987.