

Assignment 5 (Conduct a simplified valuation)

Using the travel cost method to assess the economic value of Mt. Kenya N.P. as recreational site

Due to time and resource limitations, it was not possible to conduct the proposed research (when choosing Mt. Kenya as case study, I was not aware we would be assigned to conduct research on it). However, for the sake of this exercise, we assume that it was possible to assess the guest books of 5 hotels/lodges in the Mt. Kenya National Park, analyzing a total of 1.417 entries of the years 2013.

Following the individual travel cost approach, we have grouped the different visitors into three groups (local, national and international), and estimated average cost per visit for each of the groups (based on entry fees and estimations for transport, in the case of international visitors, an average holiday with visits of three different ecosystems is costed 2.400 USD)

Group Visits Entry fee Average Cost / visit Total cost

Local 457 10 USD 12 USD 5.848 USD

National 810 10 USD 16 USD 12.960 USD

International 150 65 USD 865 USD 129.750 USD

Total 1.417 148.558 USD

Now, according to my understanding of the website

(http://www.ecosystemvaluation.org/travel_costs.htm#app_travel) one could estimate the demand function for each of the three visitor groups, but I am unsure as the description there is for the zonal travel cost approach. Also, I do not have the means to run a regression analysis on the figures above. Therefore, I use our data to estimate the money spent by the average annual 16,000 visitors to Mt. Kenya N.P. in 2013, assuming that the composition of our 1.417 visitors (and estimated cost per visit) mirrors reality.

Group Visits Average Cost / visit Total cost

Local 5.160 12 USD 61.920 USD

National 9.146 16 USD 146.336 USD

International 1.694 865 USD 1.465.310 USD

Total 16.000 1.673.566 USD

Assignment 4 (Research Plan)

Honestly speaking, I have quite some doubts whether the proposed scenario (Fencing Mt. Kenya National Park) makes sense for this assignment. Initially, I had in mind

- Assessing the economic cost of damages (farm destruction by wildlife) originating from the ecosystem in adjacent communities (a)
- Assessing the economic cost of unsustainable forest use such as charcoal production, logging etc. (b1), as well as estimating the cost of resettling the imagined community (b2)
- And "contrast" these "without project" costs of damages in and outside the park with the cost of the fence (with project scenario).

Now looking at the different methods I realize that the different cost I envisaged to assess are not related to the value of the ecosystem, especially (a) and (b2), the methods do not fit. If (b1) described a legal form of forest use, a price based method might make sense, but as it is illegal forest use inside a National Park, I do not see how the results should help us.

Maybe I am just not getting it, but I fail to see how I can assess the cost of (specific) damages to ecosystems. Are such damage cost always derived from the ecosystem's value?

As an alternative, I suggest to estimate the value of Mt. Kenya N.P. through the travel cost method, mainly for two reasons: Time pressure (deadline is tomorrow) and feasibility (I have something cost efficient in mind). Also there is not a lot of discussion in our group (if that is the right word) or maybe the IT is just not working well? Anyway:

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- Stakeholders are all visitors to Mt. Kenya, I group them into three groups (local, national, international) characterized by their origin

- My first sample is entries in guest books of the established lodges and hotels within the N.P. Of course, not all visitors write into guest books, but I assume that this unwillingness is

spread evenly across all three stakeholder groups. The advantage of this approach is, that the data could be collected by one person within a reasonably short time span.

- As it won't be possible to interview these people, I estimate journey cost and time for each of the three groups;

- To countercheck, the person collecting the data, could test the estimated journey cost and time with representatives of the three visitors groups on site (and also ask them whether there are adequate alternatives/substitutes for them).

Assignment 4

Proposed scenario: Fencing Mt. Kenya National Park

Several organizations (Rhino Ark, Kenya Wildlife Service, Kenya Forest Service, many others) are cooperating and have started to build a fence around Mt. Kenya N.P. It will be a game-proof electrified fence mainly using solar power. Access gates will be provided at various locations to allow local community user- groups (grazers, honey gatherers, dead wood collectors, etc.) to access the forest. The fence will take 5 years to complete, encircle an area of 2000 km² and be over 400 km long, requiring an estimated 1 billion KShs for construction (<http://www.rhinoark.org/news/52-mt-kenya-fence-construction-to-start-in-april-2012.html>, also <http://www.rhinoark.org/our-projects/mt-kenya-fence-project.html>).

The fence's main purpose is to stop regular crop damages by wildlife, especially elephants, as also to stop human fatalities from human-wildlife encounters (A). The fence however should also reduce unsustainable extraction of forest resources, loss of biodiversity and poaching. For the sake of our assessment we could also imagine a community that still settles within the park area (as it was the case in the 1980s) which would need to be resettled (B). At first I also thought about including the cost of "elephant transfers" for maintaining genetic diversity in the now isolated populations, however, this would be quite difficult to assess, and also I have seen that the adjacent districts (Nyeri County) plan to establish a 25 km wide corridor between Mt. Kenya NP and the Aberdare N.P., another one of Kenya's water towers, approximately 30 km away from Mt. Kenya.

I try to describe the scenario with the two components (A, B) a little more detailed:

Without project scenario:

(A) Regular crop damage mainly through elephants occurs as population density outside the park has increased over the last years. For the sake of this exercise we could assume an average of two farms (each 2.5 acre) being destroyed per month. If needed I would be interested to estimate the economic damage of this. Incurring transfer payments are compensations for farms destroyed (Estimated amount in KShs), compensation for humans killed by wildlife (Estimated amount in KShs).

(B) I would also suggest to imagine a community (e.g. 150 households with an average of 5 members each) that still lives inside the park area. One of their main income activities is production of charcoal which has led to destruction of forest and wetland, further negative impacts of the community on the N.P. are forest clearance for agriculture, poaching and waste management. If I understand the idea of transfer payments correct, there are currently no direct transfer payments flowing to the community, but payments related to the rehabilitation of damages done by the community. Transfer payments would then be the costs of potential activities on the rehabilitation of forest cleared by the community.

With project scenario:

The fence will take 5 years to complete, encircle an area of 2000 km² and be over 400 km long, requiring an estimated 1 billion KShs for construction

(A) Once completed, it can be assumed that the destruction of farms by elephants will be reduced by over 90% if not stopped completely. No further transfer payments would be necessary.

(B) The community is willing to leave their village IF they are compensated, i.e. provided with comparable housing and farming opportunities. Of course, calculating the cost of such resettlement would be quite interesting. I will also try to get some more background information on resettlement (Kenya eviction guidelines, estimation of cost of relocating one household).

I will try to give some thought to which research method would be appropriate to assess the scenario with its two components, but first I would like to hear some feed-back from the group on this proposal. As I said, I wouldn't have a problem, choosing a different scenario. I like this scenario as it includes various ideas and economical aspects. I have to admit that I had no time to read the contents etc. so I'll do that today so I can give you some more ideas and economical thoughts tomorrow!

Assignment 3

Ecosystem: MT. Kenya N.P.

Contributors: Assignment was done by Agazi Hailay Lemma, Antti Seelaff, and Anna Hummler

After having read the first 7 pages of the new chapter to read, I think in the case of Mt. Kenya National Park one could use a Demand-based method for the water supply and for the touristic activity in the National Park, as there is a demand for water as well as for entering the park for experience and recreational aspects, and an economical defined value of it as well. For the other factors I think stated preference methods would make sense, as people and organisations give the Park and its functions and features (biodiversity, climate and flood control) a value, which shows what these features are worth for the involved people. The Unesco World Heritage program for example, gave the area a special value and awards it with the nomination as a World Heritage and financial support. The total economic value of Mt Kenya National Park has use value and non-use values. These are tourism, carbon sink, fishery, water purification, recreational, art, cultural, medicinal, non-use value, research and educational. Global economic benefits for protected areas estimated 25 up to 1400 USD/ha/yr. (Van der Lely et al. 2013). Worldwide the financial costs of nature conservation are estimated 7 up to 93 USD/ha yr (Van der Lely et al. 2013). The use value can be easily calculated from the direct and indirect use of the natural resources such as fish production, ornaments, timber, tourist attraction, amenity services. The non-use values; bequest value and existence value such as avoided damage from climate change and rare species, indigenous right and cultural values. Also option values such as genetic materials for prospecting and biodiversity.

As Mt. Kenya is destination of quite a large and diverse group of visitors, I would suggest the travel cost method approach (revealed preference method). Also the effect on economy outside the National Park and the tourist fees could be evaluated, so it could be estimated what the Park is "worth" to society and the country as a whole. A disadvantage would be that one need very precise details about how the tourists spend their time in the area and what kind of services they pay. Unfortunately we only have the total average number of visitors per year (16,000) but don't know the breakdown of national/international visitors. However, my impression was that there were quite a high number of international tourists / mountain hikers.

The supplience with water could be evaluated just by mutliplying the market price for water by the quantity of water, as it is the only service provided by the area which can be quanified economically such easily.

Regarding the ecosystem services such as flood and climate control, water storage and water accumulation the Choice Experiment (Stated preference control) could be helpful. As these are non-marketed goods people/government/actors involved would have to estimate the benefit they get from the area and what consequences of loss, for example floodings, would cost. However, for the actors these costs are hard to be foreseen and estimated, they can even be influenced easily, depending on the perspective of the actor.

Reference

Van der Lely, J. A. C., van Beukering, P., Muresan, L., Cortes, D. Z., Wolfs, E., & Schep, S. (2013). The total economic value of nature on Bonaire.

Assignment 2

Ecosystem: MT. Kenya N.P.

Contributors: The information for the text was collected by Agazi Hailay Lemma, Antti Seelaff and Anna Hümmler

Mt. Kenya National Park

Since 1997 it is one of UNESCO world heritage site, which is located in Eastern parts of Africa, Kenya. It consists of the national park and the forest reserve having rich biodiversity hotspot. The total area of the national park and the forest reserve is 715 sq. km and 705 sq. km respectively. With 5,199 m altitude Mount Kenya is Africa's second highest mountain. It has volcanic origin, is still covered by glaciers and its numerous eroded slopes are covered by several vegetation bands each having adapted to the conditions at different altitudes. Provisioning - Fresh Water: Mt. Kenya NP is the main water catchment area for two of Kenya's largest rivers, Tana and Ewaso Ng'iro, providing water for over 2 million people (Gichuki 1999); Water is released by glaciers and relief rainfall is accumulated on the mountain slopes.

Provisioning - Biodiversity: High rate of biodiversity due to the altitude of the mountain and different climate zones resulting from that range of altitude, and therefore distinct ecosystems very close to each other. There are endemic species and endangered species present (part of the World heritage Properties).

Regulating - Water flow/Flood regulation: the wetlands act as a water buffer (like a sponge), storing water from surplus season and releasing it slowly during the dry season. The system inhibits floods during rainy season and ensures water supply during dry season, so there are a lot of economical benefits resulting. Another Regulation function is the climate regulation service: The forest is highly valued for its significance in the local and global carbon cycle a function of adequate carbon sink. The biomass prevents air pollution and extensive warming of the climate. The trees are able to generate high level of water cycling that continually provide a moist environmental condition preventing the ignition of fire.

Supporting - In the National Park itself there is no legal productive activities (even though officially forbidden, the national park is still subject to a variety of productive activities such as timber logging, game hunting and agricultural production). Local communities live on sustainable agriculture for self-supply (subsistence economy).

Cultural - Spiritual: All ethnical groups (Kikuyu, Meru, Embu, Maasai) that have been living around Mt. Kenya see the mountain as an important aspect of their culture, home to either their gods or ancestors. It is also of aesthetic value, inspiration, rituals, heritage values, recreation and for foreigners a touristical experience (more social and cultural values attached to forest, wild life etc.)

Cultural - Recreational: Mt. Kenya NP receives more than 16,000 visitors per year, most of which book guided mountain climbing tours. Numerous small enterprises have specialised in mountain tourism. Generally the Nat. Park generates a frequency of people visiting not only the Park, but the surrounding area, paying for catering, transport, souvenirs etc., so the Park itself is an attraction pole for the whole country and other economies benefit from it.

Contributors:

- Water users pay for water use permits
- tourists pay entrance fees when visiting the park (16,000 visitors/year)

Marketed ecosystem services:

- Provisioning: Water provision is marketed in so far, as water users have to pay fees for water user (abstraction) permits;
 - MARKET PRICE - Domestic, public, livestock = 50 Kenyan Cents/m³
 - Hydropower = 1st MW free of charge
 - over 1MW = 5 Cents / kWh

- Irrigation = 1st 300 m³/day = 50 Cents/m³
- over 300m³/day = 75 Cents / m³
- Commercial/Industrial = same rates as irrigation
- Cultural/Recreational: Visitors to Mt. Kenya N.P. pay entrance fees;
- MARKET PRICE - National child (1 day) - 600 Kenya Shilling
 - National Adult (1 day) - 900 Kenyan Shilling
 - International Adult (1 day) - 65 USD
 - (http://www.kws.org/export/sites/kws/misc/downloads/park_fees_2014.pdf)

Non-marketed ecosystem services:

- Provisioning: biodiversity (but becomes a marketed service in the case of financial support, for example from the Unesco World Heritage Program)
- Supporting: collection of medical plants in the buffer zone
- flood regulation

Positive externalities:

- flood/climate regulation
- economical effect on surrounding area

Negative Externalities:

- Wildlife, e.g. elephants, visiting/destroying agricultural fields outside the park; this is also the reason for the current fencing of the park.

TRANSFER PAYMENTS

- all taxes paid in the Nat. Park (e.g. value added tax)
- fees for water supply
- entrance fees
- Facilitation through Unesco World Heritage, probably facilitation through the government

Who benefits from the transfer payment?

- Taxes: Government, but probably facilitation of the National Park
- Fee for water supply: Water Resource Management Authority, WRMA
- Entrance fees: Institution of the Mt. Kenya National Park
- Facilitation: The National Park and the institution beyond it, maybe inhabitants, too. The whole region or country because of the touristical attraction pole

Who is paying the transfer payment?

- Taxes: Everyone? (Value added tax paid by all visitors)
- Fee for water supply: people who are supplied with water (I am unsure how effective water fee collection - enforcement of water fees - especially in rural areas is)
- Entrance fees: Visitors
- Facilitation: Unesco (donation), Government