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Recreation Use Value of Wondo Genet Wetland Forest Ecosystem to Domestic Visitors - South Ethiopia

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Abstract
The study was conducted to estimate the recreation use of value of Wondo Genet Wabeshebele resort which makes use of wetland forest ecosystem to provide its outdoor recreation services. The amenity of the site is being affected due to degradation and conversion of the natural ecosystem into other land uses. Although many domestic visitors and foreign tourists benefited from the recreation services of the site for a long time, this non-market recreation benefits rarely considered in land use decision in the area. An individual travel cost model was employed in this study to value the recreation benefits of the nature based site to domestic recreation users. Recreation service at the study site provided a consumer surplus per trip of 456 Birr (US$ 24) and 892 Birr (US$ 47) for day visitors and overnight visitors respectively. The aggregate recreation value of the site was estimated at 103.5 million Birr (US$ 5.54 million) in year 2013. The wetland forest ecosystem generated a recreation benefit flow of 1.9 million Birr (US$ 100,662) per hectare per year, considering only its service to domestic recreation users alone. The annual recreation benefit flow obtained from Wondo Genet wetland forest ecosystem could make the site to be among the terrestrial ecosystems that generates the highest benefit flow to society in comparison to value estimates made for similar ecosystems. It is important to consider this non-market recreation benefit of the wetland forest in future land use decisions in the landscape.
Keywords: Wondo Genet resort, wetland forest, travel cost, valuation, recreation benefits, hot spring, non-market ecosystem service

1. Introduction

Wondo Genet Wabeshebele resort is one of the well known nature-based recreation sites in Ethiopia. Its history as a place of recreation went back to 1964 when the then Emperor of Ethiopia Hailesalesse chose the site as his royal family place of leisure. By then he named the site as "Wondo Genet" to mean *"Wondo Paradise"* for the rich combination of hot spring from underneath the ground, ample fresh water from streams and diversity of life in the wilderness (Sim, 1979; Girma et al., 2012), all of which are found at the foot of a visually appealing mountain chain. The ecosystem can be identified as a wetland within a remnant afromontane forest (Kebede et al., 2013). Since the establishment of the resort by then as part of the Royal Palace, it has been undergoing a changing administrative set ups and has continued providing its recreation and tourism services both to domestic visitors and international tourists.

As time goes by, population pressure has continued mounting on the available natural resources of the area, where by competition for land, forest and water use has become a longstanding feature of the landscape (Zerihun, 1999; Ango and Bewket, 2007). This has resulted in the loss of forest cover (Dessie, and Kleman, 2007) and degradation of water quality and flow (Kebede et al., 2014) which are compromising the amenity of the site for recreation and tourism in a level observable to anyone who used to visit the site.

At its current state, the ecosystem is providing society many marketed and non-marketed ecosystem services. This includes, among others, land use for cash crop production (Dessie, and Kinlund, 2008) livestock grazing, water for irrigation (Mezgebo et al., 2013), water for livestock, and household use (Ayenew et al., 2015) were documented. However, the nature based recreation and tourism services of the landscape, in spite of its benefit to the wider society for a long period of time has not been studied and the extent to which society is benefiting from this service is not understood. As a result, natural resource allocations practices in the landscape so far did not give due regard to maintain the amenity of the ecosystem and sustain its recreation services.

This study was conducted to describe the value of Wondo Genet wetland forest ecosystem to domestic recreation users, as a first step towards understanding the overall economic significance of the wetland and forest ecosystem as assets for recreation and tourism in the region. The result found from the study will help to inform future natural resource allocation decisions to integrate the recreation and tourism roles of the ecosystem into the wider socio-economic development engagements in the area. Moreover, the result of this study will add to the limited knowledge about benefits from non-market ecosystem services in the region by representing a rarely reported value of nature based recreation to society in a low income country.

2. Study site description

The study was conducted at Wondo Genet Wabeshebele Resort located at about 7^0 6' N and $38^0$37' E in Ethiopia, at a distance of 270 km south of Addis Ababa. The study site is located on the foot of Abaro-Gulbicha mountain

range which marks the eastern edge of the Great Rift Valley in southern Ethiopia. The site is on the topographic transition from the rift valley low land area to the ascending mountain range which eventually forms the Arsi-Bale high land. The area receives a bimodal rainfall reaching 1200mm per annum. Mean annual temperature of the site is 19^{o}C, and elevation of the study site is 2000m above sea level.

The resort provides both outdoor recreation, and hotel services. The outdoor recreation services includes hot spring for bathing & swimming, site seeing, bird watching, and mountain trekking which are the basis for the hotel service to function. The resort used to posses 54.4 ha area of wetland forest used to supply its outdoor recreation services, although a small proportion of this area is under its control. The hotel has 40 bed rooms, a restaurant, a bar, and some artefact collection from the Emperor's time.

The majority of customers of the resort are those using the outdoor recreation services, particularly interested in the water based recreation. The entrance fee charged to the outdoor recreation service is the major source of income to the resort. The resort regarded the amenity of the surrounding natural ecosystem as its unique natural capital upon which its business as a recreation and tourism destinations depend. The picture mosaic in appendix 1 show some of the natural resources and facilities of the resort used to provide its water based outdoor recreation services to customers.

3. Study Methods/Procedures

In order to estimate the economic benefit domestic recreation users obtained from the study site travel cost method of recreation benefit valuation was applied. The travel cost method is commonly employed to value non-market recreation benefits of environmental amenity (Freeman, 2003; Ward and Beal, 2000). Recently, individual travel cost (ITC) model has been frequently used to value recreation services of a nature based site (Grafton et al, 2004; Ward and Beal, 2000). The ITC model generally assumed that there is separation between recreation and non-recreation market good consumption of an individual involved in recreation. According to Freeman, (2003), maximizing the utility of the individual from recreation subject to his/her income and time constraints results in the individual's recreation demand function as:

$Rt_i = f(Tc_i, M_i, X_i, Ps_i)$, where;

Rt_i = number of recreation trips made to a site by the i^{th} individual visitor in a period of time

Tc_i = total cost of making the recreation trip by the individual, that include round trip transportation cost, entrance fee, opportunity cost of time spent for the recreation and incremental accommodation costs due to making the recreation trip (Ward and Beal, 2000)

M_i = income of the individual

X_i= a vector of demographic variables of the individual affecting recreation consumption

Ps_i = Cost of a trip to a substitute recreation site to the individual

This study used the ITC model described above and empirical data about the variables represented in the model was collected from onsite sampled respondents from February 2013 to August 2013.

3.1 Survey mechanism and selection of sample respondents

A questionnaire was prepared both in English and in Amharic languages, the latter used to collect data about the dependent and independent variables considered in the ITC model from sampled respondents. Before starting to collect usable data for analysis, the questionnaire was tested for two weeks to assure that the questionnaire was clear and complete to capture information about respondents' recreation travel and recreation experience in relation to the study site. From previous experiences of the resort, it was known that there were visitors who stayed one or more nights at the resort, identified as overnight visitors, and other visitors who visit the study site and return back to their home on the same day, identified as day visitors.

During the test survey it was understood that a complete random selection of sample respondents was not possible, because all visitors during the survey period could not be identified at the beginning of the survey. As an approximation to a random selection, sample respondents were selected after a regular interval when entering the resort, an approach suggested by Parsons, (2003). In each survey day the first respondent from day visitors was randomly selected from the first 10 visitors and subsequent respondents were sampled in every 15th to 20th visitor when passing the thicket office into the resort, the intervals were roughly estimated to acquire the desired sample size during the survey period.

Sampling from overnight visitors, however, did not follow the procedure applied to sampling of day visitors. It was difficult to predict the time when an overnight visitor could arrive during the time of the day, many visitors arriving in the evening, which made random sampling of overnight visitors even more difficult. As a result a questionnaire was delivered to overnight visitors as they register at the reception. Those willing respondents filled in the questionnaire and returned back the completed questionnaire to the resort reception.

Moreover, the test survey helped to recognize that handing out the questionnaire to respondents sampled from day visitors to fill out the questionnaire in their time in the resort was not successful. Therefore, items in the questionnaire were asked to the respondent in the form of interview, and the answers given by the

respondent were recorded by the interviewer. The practice was demanding time and effort of the interviewer, while it helped to get complete answers to the questions in the survey as a result of the face-to-face interaction with the respondent.

Throughout the 7 months survey period every week, except few missed weeks, from Thursday to Sunday were considered for the survey. This was based on the experience of the resort that the majority of visitors were visiting the site on weekend. After the survey was completed, travel costs and recreation experiences representing each sampled respondent were compiled and encoded for analysis.

3.2 Estimating respondents' travel cost to the study site

In estimating the respondents travel cost to the study site, a procedure similar to the total expense approach described by **Fletcher et al., (1990**) was used. The total travel cost of a sampled respondent for the trip made to the study site was estimated as the sum of the round trip transportation cost, the entrance fee, the respondent's opportunity cost of time spent during travelling and staying on the site, and the amount of incremental accommodation costs due to the recreation trip (**Ward and Beal, 2000). Each component of the travel cost was specifically asked from the respondent and separately recorded.** The self-reported transportation expenditures by the respondent were verified against transportation tariffs or against estimated cost of fuel consumption for the round trip distance travelled by the respondent. Usually the self-reported expenditures by the respondents represented their costs of travelling.

For respondents who visited the study site in a group such as a packaged trip by a peer group, or family members making the recreation trip together, the overall travel cost expenditure of the group was divided up among the number of members in the group and the share of the respondent from the total cost of the group was considered as the respondent's travel cost to the study site following **Ward and Beal, (2000)**.

For respondents who made visits to other sites in addition to the study site during the trip under consideration, that accounted two-**third of the total respondents sampled from overnight visitors (n=67) and about 10% of respondents sampled from day visitors (n=263),** the relative importance of the sites visited on the respondent's decision of making the trip was identified as described by Parsons and Wilson, (1997).

From the number of respondents who made multiple-sites visit during their trip, about half of them in the overnight visitor category; and almost all of them in the day visitor category identified the study site as their primary destination of their recreation trip. Moreover, using a follow up question these respondents confirmed that they would not have made the trip, if the study site was not in the list of sites they visited during the trip. According to Parsons and Wilson, (1997) for such respondents the other sites visited were considered as "incidental" recreation consumption, so that the entire travel cost expenditure in the trip was attributed as travel cost to the study site. However, remaining respondents who chose another site as their primary destination, or chose the study site jointly with the other sites when deciding to make the trip, only the incremental travel expenses from their respective sites of primary destination to the study site was considered, which is an approach followed by for example, Kerkvlier et al. (2002), **Fletcher et al. (1990**), **Parsons and Wilson, (1997).**

The respondent's opportunity cost of time spent during the recreation trip was also judged by the respondents themselves, an approach explained by **Fletcher et al. (1990**). Few respondents from the day visitors and about 5% of respondents from overnight visitors claimed a positive opportunity cost of time for their travel and on-site stay. The remaining majority explained that they made their recreation trips on their days off, or in their non-working time, or after making pre-planed arrangements to avoid lose of income during their recreation time, so that they did not have considered a loss of income because of their recreation. For respondents who stated an opportunity cost of time for their trip, the feasibility of the claimed time cost was judge against the respondent's job employment background by further asking verifying questions during the interview and finally the stated opportunity cost of recreation time by the respondent were considered as a component of the respondent's travel cost. This practice was adopted to better represent trip maker's circumstances of time allocation to recreation in a society predominantly employing diversified and subsistence type of livelihood strategies where a labour market wage rate barely fit to many households labour engagement, unlike the case for recreation consumers in developed countries.

3.3 Estimating recreation demand function to the study site

Having collected the empirical data on the variables in ITC model from on-site sampled respondents, parameter estimation were made using the Poisson and Negative Binomial count data regression models (Creel and Loomis, 1990). The expected number of trips made to the study site (λ) is assumed to be a function of the variables specified in the ITC model. Usually, λ takes a log-linear functional form as:

$\lambda = \exp(X\beta) + \varepsilon$; where, X represents the vector of the independent variables, β is a vector of coefficients of the independent variables and ε is the error term.

Since data about the dependent and independent variables in ITC model was collected from respondents

sampled on-site and the resulting data about the dependent variable was found to exhibit over dispersion as explained by the non-zero dispersion parameter, alpha value of 2.8 and 1.8 for day time and overnight visitors respectively. As a result of this, a zero truncated Binomial Probability distribution was used to describe the recreation demand function to the study site, which was ultimately used to estimate the welfare effect of the recreation services provided by the study site.

According to Grogger and Carson, (1991), the probability of observing an individual take (y) number of trips in a period of time using the Binomial Probability distribution truncated at zero is given by:

$$\text{Prob}(Y= y/Y>0) = \left(\frac{\Gamma(y+1/\alpha)}{\Gamma(y+1)\Gamma(1/\alpha)}\right)(\alpha\lambda)^{y}(1+\alpha\lambda)^{-(y+1/\alpha)}\left[1-F_{nb}(0)\right]^{-1}$$

Where, y = 1, 2, 3, 4…; λ is the expected number of trips = E(Y); Γ represents the gamma distribution and α denotes the dispersion parameter, where the rate of dispersion is given by: $\frac{Var(y/X)}{E(y/X)} = 1+\alpha * E(y/X)$

Variance, $Var(y/X) = E(y/X)(1+\alpha * E(y/X))$

Conditional mean, E(Y/X, Y>0) = $\lambda(1-F_{nb}(0))^{-1}$

To estimate the parameters of variables in the recreation demand function in the above zero truncated Negative Binomial count data regression model, LIMDEP™ econometric software was used.

3.4 Estimating welfare gain from recreation services of the study site

The net benefit recreation users obtained from visiting the study site was estimated using consumer surplus at average values of the independent variables used in the recreation demand function (Freeman, 2003). According to Creel and Loomis, (1990), for a recreation demand function adopting a semi-log functional form, the consumer surplus (CS) a visitor obtained from the recreation services of the study site was estimated as:

CS per recreation trip = $-1/\beta_{Tc}$;

CS per visitor per year on average = $-\hat{y}/\beta_{Tc}$; where, β_{Tc} is the coefficient of the price variable, i.e. the coefficient of the travel cost variable in the recreation demand function to the study site, and $\hat{y}$ is the predicted number of trips at average values of the independent variables in the recreation demand function.

4. Result and Discussion

4.1 Description of the survey respondents

The interview approach employed for day visitor respondents during the field survey produced a high response rate of 91% from the initially expected sample size of 300 respondents. However, 8% of the day visitor sampled respondents initially approached for the interview declined to cooperate. From the questionnaires dispatched to overnight visitors about 45% was returned with complete data from the initially expected 150 sample respondents.

As shown in table 1, male respondents were more than female respondents in both category of visitors, with a higher gap between the number of male and female respondents for overnight visitor respondents. About two-third of the respondents in both of the day visitor and overnight respondent categories attended a College or University education. All overnight respondents attained high school and above education levels, about half of them attending University education. Where as, about 8% of the day visitor respondents attained only primary education and another 3% had no education. In terms of age, respondents in both category of visitors represented all age levels. However, about half of the respondents from day visitors were younger than 35 years of age, while about 90% of respondents from overnight visitors were older than 30 years of age; which is a reflection of the general population of day visitors as being young age dominated, while overnight visitors are commonly middle aged and older.

Table 2: Summary statistics of respondents

Respondent category		PDVR	POVR	Respondents age category (in years)	PDVR	PDVR
Sex	Female	37	17	15-19.9	6	2.8
	Male	63	83	20-24.9	24	5.7
Education	No education	3	0	30-34.9	17	28.5
	Primary school	8	0	35-39.9	10	22.8
	High school	27	34	40-44.9	7	17
	College	24	17	45-49.9	2	17
	University	38	49	>50	1	5.7
Employment	Government	20	14	PDVR = percentage of day visitor respondents (n=273)		
	NGO	9	14			
	Private	15	40			
	Self employed	46	23	POVR = percentage of overnight visitor respondents (n=67)		
	Other: unemployed, and students	6	9			

Respondents' travel information revealed that respondents came from 31 urban centres, most of them located within an approximately 270 km radius from the study site. Areas with more number of visitors accounting 30%, 28%, 16% and 3% of the day visitor respondents came from Shashemene, Hawassa, Addis Abeba and Adama urban areas respectively. Most overnight visitors, however, came from relatively far way urban areas mainly Addis Abeba, Debre Zeit, Adama, Meki, and Dilla. While 66% of overnight visitor respondents visited other sites during their trip to the study site, only 10% of the day visitor respondents visited Hawassa city on their trip to the study site. Almost all respondents from overnight visitors indicated substitute sites; the most frequently mentioned substitute sites were Sodere resort, Langano resort, Addis Ababa "fel wuha" and Yergalem "fel wuha".

About two-thirds of respondents from day visitors identified a substitute site. Respondents who identified a substitute sites tended to be those coming from far away locations form the study site, while respondents near to the study site rarely mentioned a substitute site. From the overnight visitor respondents those who stayed one night, two nights, three nights and more than three nights accounted in their order 64%, 26%, 5% and 5% of the total overnight visitor respondents. The mean number of nights that overnight visitor respondents stayed at the study site was about 1.5 nights – 36 hours.

4.2 Estimating the recreation demand function of visitors to the study site

To estimate the recreation demand function of visitors, Poisson and Negative Binomial regression models were tested. The value of the dispersion parameter in the truncated Poisson regression model 3.6 and the non zero alpha value of 2.8 in the truncated negative binomial regression model indicated that the number of recreation trips made by day visitor respondents was over dispersed. Similarly, the dependent variable for overnight visitor respondents was also over dispersed. It was known that the Poisson regression for an over dispersed dependent variable results parameter estimates seemingly more significant and resulting in a biased parameter estimate of variables in the recreation demand function that inflate the consumer surplus value (Gomez and Ozuna, 1993, Creel and Loomis, 1990). This was observed with the data set this study obtained both from day visitor and overnight visitor respondents. As a result, parameter estimates using the truncated negative binomial regression model, presented in table 2, was used to describe the recreation demand functions separately for day visitors and overnight visitors of the study site.

Table 2: Parameter estimates for variables in the recreation demand function using zero- Truncated Negative Binomial regression for day visitors and overnight visitors

Day visitors (n=237)					Overnight visitors (n=67)			
Variable	Coefficient	Standard Error of Coefficient	P[|Z|>z]	Mean	Coefficient	Standard error of Coefficient	P[|Z|>z]	Mean
Constant	1.379*	0.625	0.0274		-0.6418	1.28614	0.6177	
TC	-2.19E-3***	3.2E-4	0.0000	367	-0.00112*	0.00049	0.0157	1562
INCOME	8.6E-6***	2.9E-6	0.0033	45981	-6.34E-08	7.9E-06	0.9936	50470
SEX	0.94***	0.2026	0.0000	0.63	1.2771	0.70131	0.0686	0.8286
AGE	-0.0148	0.0178	0.4061	29.73	-0.0117	0.03198	0.713	36.2537
JOB	0.32**	0.1243	0.0099	2.11	-0.1913	0.45984	0.6773	2.5428
EDU	-0.1752	0.1435	0.2225	2.86	0.3256	0.47491	0.4929	4.1428
SUBST	0.0005	0.0003	0.0949	164.5	0.0015**	0.00055	0.0062	887.773
Alpha	2.820***	0.8648	0.0011		1.8128	2.48175	0.4651	
Log likelihood function			-671.02		-94.179			
Chi squared			2064.16		26.3791			
Prob.[Chi Squared > value]			0.0000		0.0000			
McFadden's Pseudo R-square			0.72638		0.3364			
Consumer surplus (CS)/trip in Eth Birr (US$)[1]			456 (24.4)		892 (47.7)			
Predicted mean number of trips per visitor/year			4		1.54			
CS per visitor/year in Eth Birr (US$)			1826 (97)		1375 (73.5)			

Coefficients marked by: *, ** and *** are significant at alpha 10%, 5% and 1% levels, respectively.
...E... = the number preceding to E is multiplied by ten to the power of the number that follow E.

Table 3: Key to the abbreviations used for the variables in the recreation demand functions

Variable abbreviations	Description of the variable
TRIPS	Number of recreation visits made by a respondent to the study site during the past one year
TC	The respondent's cost of accessing the study site (the sum of round trip transportation cost, entrance fee, opportunity cost of the respondent's time spent during the visit)
SUBST	The respondent's cost of accessing his/her substitute recreation site
INCOME	Annual household income of the respondent
AGE	Age of the respondent
GENDER	Dummy variable = 1 if respondent is male; otherwise 0
JOB	Respondents employment as categorized in table 1
EDU	Respondents level of education attained as categorized in table 1

4.3 Model fitness & effects of explanatory variables to recreation demand of visitors

Initially, family size, employment status, other sites visited and the type of transport means used were included in the recreation demand function in addition to the list of explanatory variables shown in table 3 to test if each of them contributed to explain respondents' recreation demand to the study site. These variables mentioned above were not significant in the ITC model and their presence barely improved the log likelihood function from - 671 to -669. Therefore, they were dropped from the model and finally eight independent variables including the constant term were used to describe the recreation demand function of visitors to the study site. The recreation demand function can be expressed as:

Day visitors: Ln (TRIPS) =1.379 – (00219 TC) + (8.6E-6) INCOME + (0.94 SEX) - (0.0148 AGE) + (0.32 JOB) – (0.17516 EDU)+ (4.95E-4) SUBST

Overnight visitors: Ln (TRIPS) = -0.6418 – (0.00112 TC) - (6.34E-08) INCOME + (1.2771 SEX) - (0.0117 AGE) - (0.1913 JOB) + (0.3256 EDU) + (0.0015) SUBST

Overall, the ability of the independent variables used in the recreation demand function in predicting number of recreation trips made by respondents to the study site was significant fro both day visitor and overnight visitor respondents, as explained by the significant Chi square value at alpha 1%. However, performance of the regression model for overnight visitors seem relatively inferior when compared to that of the day visitors as implied by the lower Chi square and Pseudo R-square values of the recreation demand function of overnight visitors. This can be due to the small sample size taken in proportion to the low population size of overnight visitors in relation to the large population size of day visitors which exceeded the overnight visitors by more than

[1] US $ 1 =18.7 Birr in June 2013

30 folds.

Based on the truncated negative binomial regression model outputs the explanatory variables used in the recreation demand function indicated the expected effects on the number of recreation trips respondents took to the study site. The travel cost variable (TC) showed a negative sign in both the day visitors' and overnight visitors' recreation demand functions, which explain as the cost of making a trip to the study site increased, the number of trips made to the site decreased. The cost of accessing a substitute site (SUBST) had a positive sign in both demand functions indicating an increase in the cost of accessing a respondent's substitute site encouraged the respondent to make more number of trips to the study site. These effects are generally as expected according to the theory of recreation demand for a nature based site (Ward and Beal, 2000). Respondent's sex being male contributed to more number of visits to the study site both for day visitors and overnight visitors. Respondents' household income (INCOME) was not statistically significant both for day visitors and overnight visitors which was observed in other studies too, for example, Shrestha and Loomis, (2003) and Kerkvliet et al, (2002).

It is important to observe interesting differences between the recreation demand functions of the day visitors and overnight visitors. First, the mean travel cost to the study site, mean travel cost to substitute sites and mean income and age were higher for overnight visitors compared to the mean values of the corresponding variables representing day visitors.

While travel cost to a substitute site was significant to overnight visitors, it was not significant to day visitors. This might mean day visitors recreation consumption to the study site was not significantly affected by the cost of accessing a substitute site, implying the study site tended to be unique for day time visitors; while overnight visitors could substitute their recreation at the study site with services available at other sites depending on the cost of recreation at the substitute sites.

4.4 Net benefit of the recreation service at the study site

The consumer surplus recreation visitors obtained from recreation services of the study site was estimated from the recreation demand functions. The consumer surplus per a recreation trip made by a day visitor and an overnight visitor was estimated as 456 Birr[1] (US$[2] 24) and 892 Birr (US$ 47), respectively. The predicted number of recreation trips to the study site were 4 and 1.6 per year on average for a day visitor and an overnight visitor respectively. This was translated in to a per visitor person net benefit per year of 1826 Birr (US$ 97) and 1375 Birr (US$ 73) for a day visitor and overnight visitor respectively.

The aggregate recreation net benefit the study site provided to day visitors and overnight visitors amounted to 98.2 million Birr (US$ 5.25 million) and 5.35 million Birr (US$ 0.28 million), respectively, corresponding to 215,000 day visits and about 6000 number of overnight visits made to the study site in 2013. The aggregate net benefit both day visitors and overnight visitors obtained from making recreation at the study site amounted to 103.5 million Birr (US$ 5.54 million) in year 2013. The hot spring related services are provided on a land area spanning a few hectares out of the total claimed 55 hectares holdings of the resort. Out of this total currently in use is about one-fifth of it. Considering the total claimed 55 hectares land area of the resort, the per hectare recreation net benefit of the wetland forest ecosystem at Wondo Genet, only to domestic visitors, amounted to 1.9 million Birr (US$ 100,662) per year.

In comparing the results of this study with other study results, it is important to note the remark made by Smith and Kaoru, (1990) that travel cost study results differ among other things due to the type of recreation activity being valued, the approaches followed in sampling and travel cost expenditure estimation, and the econometric methods applied in estimating the welfare measures. Due to lack of study results reported from countries at similar level of socio-economic development and for a similar set of recreation amenity, available study results were consulted to judge the feasibility of the results obtained in this study, rather than to make a strict comparison of the results.

The consumer surplus per trip estimates found in this study as US$ 24 and US$ 47, the latter for overnight visit having a mean 1.5 days stay at the study site, lies in the ranges of consumer surplus per trip value estimates of US$ 20 to US$ 45 made by Shrestha, & Loomis, (2001:77) based on outdoor recreation valuation results reported in countries outside of the US. The net benefit per person value estimate of US$ 97 and US$ 73 for the two category of visitors in this study can be considered close to the per domestic visitor consumer surplus estimate of US $68 to $85 for wild animals viewing at Nakuru National Park in Kenya (Navrud and Mungatana, 1994). Shrestha, et al, (2002), also reported a consumer surplus value estimate of US$ 86.35 per person per day for recreational fishing in the Brazilian Pantanal. The slightly higher per person net benefit per year of US$ 97 estimated for day visitors in this study can be due to the high mean frequency of visits made to the study site - a predicted number of 4 visits per person per year. Number of trips made to a water based recreation site was known to be higher than that of other nature based sites as observed by Smith and Kaoru, (1990).

The recreation net benefit provided to domestic recreation users alone from a hectare of Wondo Genet

[1] All value estimates as results of this study are expressed in 2013 Ethiopian Birr or in 2013 US Dollar

wetland forest amounted US$ 100,662 per year was found to be much higher than the mean per hectare recreation value of wetlands or forest ecosystems. It is rather comparable to the maximum overall net benefit flow of about a hundred thousands US Dollar per hectare per year obtained from inland wetland (de Groot et al., 2012:56). Costanza et al., (2014) in their valuation of the global ecosystems indicated that coastal wetlands and coral reefs generated the highest mean per hectare per year benefit flow of US$ 193,845 and US$ 352,249 respectively; while the maximum for the latter reaching up to US$ 2 million per hectare per year.

One may cast a doubt on the high per hectare value of Wondo Genet wet land forest ecosystem for its service to domestic recreation users in a least developed country. But, facts about the features of the recreation service at the study site may explain why this is so. Primarily, number of visitors and visits made to the site per year is quite high because of the proximity of the site to major population centres of Hawassa, Shashemene, Arsi Negele, and Wondo Genet towns, which in aggregate inhabits well over half a million people within a 40 km distance. As a result a great deal of users from these areas visit the study site more frequently, some of them regularly. Second, the study site provides unique recreation experience to visitors as explained by the insignificant substitute site use of respondents in the recreation demand function of day visitors who contributed the lions' share to the total value of the site. This is true, given the scarcity of water based recreation facilities in the region to be used as an alternative. Finally, the unique amenity the study site posses, including the hot spring for some visitors double up a health benefit apart from its leisure benefit, enabled the study site to acquire a "brand name" in the general public for long as best nature based site in the region. This caused the study site to receive the most attention from potential visitors who put the study site in their top priority to visit among any available leisure options to them. These specific local realities might have caused the high demand for the services of Wondo Genet wetland forest ecosystems and contributed to the high per hectare value of the study site.

5. Conclusion

Wondo Genet Wabeshebele resort and its surroundings has been serving domestic visitors and international tourists for a long time. This study shed a light primarily on the high demand for the recreation services of the site. The big number of recreation visits made to the site per year by visitors coming from wide geographical locations of 31 urban centres of Ethiopia alone explains the significance of the site as important recreation destination to the wider public.

The individual travel cost model applied in this study has well explained the recreation demand of domestic visitors of the study site. Apart from the expected influences of the variables used in the ITC model to the amount of visitors' recreation consumption at the study site, the model was able to discriminate the differences between the day visitors' and overnight visitors' recreation behaviour. This include, while overnight visitors had a substitute sites for their recreation at the study site, day visitors had not. The other difference is that day visitors in spite of having a lower consumer surplus per trip value, on average, a day visitor derive more net benefits from recreation at the study site in a year period compared to that of an overnight visitor, mainly because of the relatively more frequent visits made by a day visitor to the study site on average.

The ITC valuation result indicated that both day visitors and overnight visitors obtain a recreation net benefit from the study site that approach the maximum of the value ranges observed in other studies. The total net benefit day visitors obtain from the study site per year is 18 times more than that of overnight visitors, mainly due to the number of day visits made to the site per year exceed 30 folds of the number of overnight visits made to the site in the same period. The annual benefit flow obtained from Wondo Genet wetland forest ecosystem just for domestic recreation services alone, could make the study site to be among the terrestrial ecosystems that generates the highest benefit flow to society in comparison to value estimates made for major ecosystems of the world in Costanza et al,. (2014). This high value of the site is mainly due to the unique amenity of the site, lack of substitute sites for most visitors, and the high population density in close proximity with limited alternative outdoor recreation facilities.

The non-market ecosystem services of wetlands and/or forest land uses can be significant which deserves due consideration before decisions involving conversion of the ecosystems are put into practice. Finally, this study points to the fact that nature based recreation can contribute to significant welfare improvement to society living in a low income country and non-market economic valuation techniques can be successfully applied to generate policy relevant information in Ethiopia too.

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Appendix

Photo mosaic showing some of the natural amenities and recreation services of the study site

Upper left: Stream flow enjoyed by visitors, its water used to cool down the hot spring water for bathing and swimming. **Upper right:** the hot spring at its source providing hot water for bathing and swimming. **Lower left:** visitors at the ticket office to enter into bathing and/or swimming. **Lower middle:** visitors bathing in the open hot spring fall. **Lower right:** Visitors swimming in the pools filled with hot spring water. Photos: by author