The contribution of local outdoor recreational services to the sustainable management of environmental resources: the case of Tabor Mountain Recreational Park in Hawassa City, Ethiopia

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ABSTRACT
There has to date been limited research on the economic valuation of local outdoor recreational services to inform policy and practice. This study attempts to fill this gap by estimating the annual recreational value of Tabor Mountain Recreational Park, an open-access recreational site in Hawassa City (also known as Awassa City), Ethiopia. This study employs single-bounded dichotomous choice and open-ended elicitation methods using primary and secondary data collected from 260 urban residents during June–August 2019. A complementary assessment of the determinants of local visitors’ willingness-to-pay (WTP) is also carried out. Descriptive statistics and a binary logistic regression model were used to analyze the survey data. Overall, 87% and 98% of the respondents were willing to accept the initial bid value and to give non-zero maximum WTP, respectively. On average, a local resident makes/intends to make 2.57 visits per month paying a mean entrance fee of ETB 28.33 per visit, which represents approximately ETB 93,498,000 per year. Furthermore, average monthly income and the afternoon visiting-time preference of local visitors had a positive effect on individuals’ WTP. Initial bid value, frequency of visits per month, number of dependent families, and age of local visitors had a negative effect on WTP. The substantial annual local recreational value estimate of Tabor Mountain Park reveals the potential of local financing alternatives for sustainable development and management of environmental resources in similar settings.

Introduction
Recreation enables people to regain lost energy and to derive a sense of joy, refreshment, and satisfaction which can heal physical and mental fatigue and strain. Such pursuits that stimulate and promote this capacity can be physical, mental, cultural, and/or social, artistic, and craft-based and can entail either indoor or outdoor activities (Cushman and Laidler 1990; Aafid 2016). Although outdoor recreation has no clear and unique definition (Wolf-Watz 2011), it typically involves interaction between people and environmental and natural resources (Moore and Driver 2005). Lakes, mountains, forests, rivers, and streams are the main natural resource systems that are frequently used for outdoor-recreational activities that include forest walking, bird watching, fishing, hunting, boating, hiking, and camping (Freeman et al. 2014). The recreational functions of environmental and natural resources can be quite sizeable when they are proximate to cities.

In addition to recreation, mountains are important resources and serve as a source of diverse products and services essential for human survival and development. These include supply of water, energy, microclimate regulation, and minerals. Consequently, the lives of more than half of the world’s population depend on resources connected to mountains. Further, 26% of the population resides in mountainous regions and 40% lives in the watersheds of rivers that have their sources in mountains (United Nations 1992; Meybeck, Green, and Vörösmarty 2001). However, owing to increasing stress imposed by human interference, most mountain areas are experiencing environmental degradation (United Nations 1992; Beniston 2003; Wassie 2020) as a result of deepening poverty and unemployment levels in communities dependent on the functions and services of mountainous areas (Price 2005; Hussain et al. 2019). Hence, for the sustainable utilization of environmental and natural resources, there has to be a clear understanding of their potential value, both in economic and environmental terms.
resources of mountainous areas, policy interventions based on sound scientific evidence that recognizes the economic, social and ecological importance of these resources is required.

Hawassa City (also known as Awassa City) is an emerging city in Ethiopia that has diverse natural, cultural, and historical attractions as well as mountainous terrain. Tabor Mountain Recreational Park (TMRP) is an open-access recreational site in the city that is rich in flora and fauna and the park plays a vital role in providing multiple and diverse recreational services. The summit of TMRP offers a suitable viewpoint to survey the city, to watch hippopotamuses in Lake Hawassa, and to enjoy the surrounding landscape. Furthermore, the relative position of TMRP makes it suitable for physical exercise (hiking and trekking), relaxing, meditating, camping, and social gathering including for religious conferences and weddings involving both domestic and foreign tourists (Gedeicho 2015; FEDD Hawassa 2019). However, the infrastructure and facilities in the park is inadequate and poorly maintained and the quality of the recreational site is deteriorating due to lack of proper management and other problems associated with public resources (Gedeicho 2015; Hailegiorgis 2017).

Although many recreational value-estimation studies have been made for various recreational sites in Hawassa (Gedeicho 2015; Hailegiorgis 2017; Molla, Ilporukpo, and Olatabara 2018; Tule 2019; Gashu and Gebre-Egziabher 2019), there has been to date no valuation study of the local outdoor-recreational value of TMRP. In addition, most previous works have not adequately looked at the potential of local resident visitors. The success of environmental conservation, especially in developing countries such as Ethiopia, depends on the preference and resource-use behavior of local residents. Therefore, setting an accurate value, including the estimate of local visitors’ contribution to outdoor recreation, can provide multifaceted benefits. Importantly, this information would help to promote sustainable management and utilization of environmental resources on the basis of local capacity and provide a reliable estimate for comparing alternative functions (i.e., recreation vs. other alternatives), to set a ceiling fee if the resource were to be used for another function under a suitable property-right arrangement (Clawson 1959). Moreover, understanding local user intentions, motivations, and potential contributions could provide a way to explore the development and sustainable management of environmental resources while relying on local capacity. Having an estimate of the local outdoor recreational value of TMRP is a prerequisite for sound decision making to promote more effective utilization of the park. Accordingly, the objectives of this study are (1) to estimate the local recreational value of TMRP and (2) to assess the determinants of local visitors willingness-to-pay (WTP) for the development and management of the park based on data collected from Hawassa City residents.

**Methods**

**Description of study area**

The research reported in this article was conducted in Hawassa City, the capital of both Sidama and Southern Nations Nationalities and Peoples Regional State (SNNPRS). It is located in the southern part of the country on the shore of Lake Hawassa in the Great Rift Valley and is 273 kilometers (km) south of Addis Ababa. Its geographical location is 7°3’ latitude North and 38°28’ longitude East. Currently, Hawassa City is one of the better planned metropolitan centers in Ethiopia with promising development prospects compared to other cities in the country. According to the 2019 demographic estimate, the city has a population of approximately 419,655 of which 51.4% are male and 48.6% are female. Roughly 66% of the population residing in the area of the municipal administration is urban and 34% is rural (FEDD Hawassa 2019) (Figure 1).

The municipal administrative area covers 157.2 square kilometers (km²) and is divided into eight sub-cities and 32 wards (kebeles). The average elevation of the city is about 1,700 meters above sea level (MASL) and the elevation of Tabor Mountain is approximately 1,750 MASL at its base and 1,813 MASL at its summit. The lowest elevation of the city is 1,680 MASL at the lakeshore. According to the municipal administration, Hawassa City has a moderate climate with mean annual precipitation of 998.2 millimeters (mm) and mean annual temperature ranging from 6°C to 30°C.

In addition to TMRP, Hawassa City has many environmental and cultural tourist attractions. These include Lake Hawassa with its diverse bird and aquatic species, Mount Alamura that is home to varied fauna and flora, Amora Gedel with its fascinating scenic view, Burkita Hot Springs, King Hailesilassie I Palace, Saint Gabriel Church, and UNESCO-registered Fiche-Chambalala traditional new year celebration of the Sidama people (Gedeicho 2015; Hailegiorgis 2017; FEDD Hawassa 2019). However, these sites, including Tabor Mountain, could serve to encourage domestic and international tourism but they not adequately utilized due to the fact that most lack basic facilities, are underdeveloped, and suffer from ineffectual management (Hailegiorgis 2017).
Valuation methodology

The contingent valuation method (CVM) is one of the most popular ways to estimate the use and nonuse values of environmental resources. This procedure captures information about individuals’ preferences, demands, and WTP for aspired goods and services described in hypothetical scenarios and is suitable for estimating the total economic value (TEV) of non-marketed environmental goods and services (Bateman and Langford 1997; Hajkowicz and Okotai 2006). Therefore, CVM is an important tool for eliciting individuals’ preferences in monetary terms for changes in the quantity and/or quality of non-market environmental goods and services that have the characteristic of non-excludability and non-divisibility. It can also be used to estimate maximum WTP to restore or preserve an amenity that a respondent has never visited or used (Birol, Karousakis, and Koundouri 2006). Despite its considerable advantages, data generated through CVM surveys may be subject to potential biases associated with design as well as operational, hypothetical, and strategic considerations (Diamond and Hausman 1994). Therefore, when conducting a CVM survey, care must be taken to control the sources of bias by employing a good survey design, maintaining the adequacy of samples, developing a well-narrated hypothetical scenario, and utilizing appropriate eliciting formats and payment vehicles.

Although design and application of CVM are under continuous improvement, there are four popular elicitation formats: (1) payment card, (2) open-ended question, (3) bidding game, and (4) single- and double-bounded dichotomous choice (DC) (Arrow et al. 1993; Emiru and Gemechu 2017). Each elicitation format has its own advantages and disadvantages. The DC approach is gaining considerable popularity among recent scholars, especially when the sample is finite (Hanemann, Loomis, and Kanninen 1991; Loomis 2014; Song et al. 2019). While applying the double-bounded dichotomous choice (DBDC) approach, in addition to starting point bias, the potential for nonresponse bias is high as respondents can become discouraged because of the complexity of the questionnaire. Because the elicitation question iterates to probe the second bid (WTA) of a participant for lower bid value when the initial bid value is rejected, and for a higher bid value when the initial bid value is accepted, it can become discouraging to complete (Herriges and Shogren 1996). To avoid such biases associated with the DBDC, we employed a combination of single-bounded dichotomous choice (SBDC) and open-ended elicitation formats. The choice of appropriate payment vehicles is another significant factor for obtaining realistic estimates (Gordillo, Elsasser, and Günter 2019). Accordingly, we used the entrance fee, the most popular payment mechanism for accessing recreational services at

Figure 1. Map of the study area (Source: CSA 2012).
many public and private sites (e.g., Gudumale Park) (Baral, Stern, and Bhattarai 2008; Nuva et al. 2009; Avenzora et al. 2016).

**Sampling techniques and sample size**

As the aim of this study was to estimate the local recreational value of TMRP based on data collected from urban residents of Hawassa City, a four-stage sampling technique was used to select respondents. First, we purposively selected Hawassa City owing to the services gained from Tabor Mountain. Second, based on review of secondary sources, we identified seven sub-cities. One of the sub-cities, Tula, is dominated by rural residents and was excluded from the study because they rarely visit this recreational park. Finally, we used a proportional random sampling technique to select respondents from each kebele in the seven sub-cities. Finally, we surveyed 260 residents using the procedures outlined by Bartlett, Kotrlik, and Higgins (2001) with a 1% significance level and 3% margin of error.

**Types and methods of data collection**

We used in this study both qualitative and quantitative data from primary and secondary sources. Specific methods included desk research, local resident surveys, key-informant interviews, focus groups, and observational data collection. The face-to-face personal interviews with local residents were conducted at their home-gate from June to August 2019.

**Questionnaire and hypothetical market scenario**

The survey used to collect primary data was organized into three sections. The first section requested information on the socioeconomic and demographic characteristics of respondents. The second section explored the importance of TMRP for recreation, its use value, visiting preferences, and frequency of visits. The final section consisted of the hypothetical scenario and WTP elicitation procedures. Since it is essential to provide respondents with sufficient information about the proposed development and management of the site to control for hypothetical bias (Baral, Stern, and Bhattarai 2008; Casey and Schuhmann 2019; Aseres and Sira 2020), we described both the status quo and the hypothetical scenario (Table 1). We formulated the hypothetical scenario with initial bid values based on information obtained from key informants and focus-group participants from tourism offices and Hawassa University, systematic observation, and review of secondary sources. Accordingly, ten bid values, i.e., 1, 2, 3, 5, 7, 10, 15, 20, 25, and 30 Ethiopian Birr (ETB) were used in the CVM survey. The bid values were determined based on actual entrance fees to three similar recreational parks in the city (Amora Gedel = 25 ETB), Millennium Park = 10 ETB) and Burita = 5 ETB) (Gedecho 2015).

**Elicitation method and payment vehicle**

We used a SBDC survey asking whether respondents are willing to pay a specified random entrance fee to visit TMRP, followed by an open-ended question that inquired about the estimate of their personal maximum entrance fee regardless of acceptance or rejection of the proposed random bid value, called maximum WTP. In general, respondents were initially asked whether they were willing to accept a randomly assigned bid value per person per visit to TMRP as an indicator of support for development and management of the park as described in the scenario. We then asked respondents to give their personal maximum willingness to pay to visit TMRP regardless of whether they accepted or rejected the initial bid value. We selected the SBDC questions and combined them with the open-ended format to compensate for the biases associated with both elicitation formats (Whitehead 2002; Ojeda Mayer, and Solomon 2008). Moreover, to reduce bias associated with the payment vehicle, we used the entrance fee (entry ticket) per person at the time of visit (Halkos, Leonti, and Sardianou 2020) which is the most common approach under such circumstances. To enhance mitigation of biases, we tested the questionnaire with a randomly selected group of 14 residents before implementing the actual survey (Baral, Stern, and Bhattarai 2008; Han et al. 2011; Aseres and Sira 2020).

| Table 1. Hypothetical market/CVM scenario. |
|-------------------------------------------|
| If Tabor Mountain Recreational Park is left undeveloped as an open recreational park in business as usual, past trends suggest that site quality will continue to decline and the recreational services of the mountain will deteriorate. Moreover, if left unmanaged, the plant and wildlife diversity will diminish and the functionality of the park will continue to worsen. These circumstances could lead to a situation where the park became a hotspot for damaging urban floods and exacerbate personal insecurity including robbery and violence. To avoid this situation and enhance the quality of TMRP, and also to increase tourist visitation to the park, to generate youth employment, to boost municipal revenue, and to create new livelihoods for the local community, the following new development and management program are proposed: Fencing and securing the park Construction of roads for walking, bicycling, and driving from the city center to the top of the mountain and inside the park Construction of benches for relaxing, reading, and social gathering Construction of service centers for games, snacks, hot drinks, and beverages as well as for reserving sites Undertake the planting of indigenous trees, ornamentals, and flowers. |

The final section consisted of the hypothetical scenario and WTP elicitation procedures. Since it is essential to provide respondents with sufficient information about the proposed development and management of the site to control for hypothetical bias (Baral, Stern, and Bhattarai 2008; Casey and Schuhmann 2019; Aseres and Sira 2020), we described both the status quo and the hypothetical scenario (Table 1). We formulated the hypothetical scenario with initial bid values based on information obtained from key informants and focus-group participants from tourism offices and Hawassa University, systematic observation, and review of secondary sources. Accordingly, ten bid values, i.e., 1, 2, 3, 5, 7, 10, 15, 20, 25, and 30 Ethiopian Birr (ETB) were used in the CVM survey. The bid values were determined based on actual entrance fees to three similar recreational parks in the city (Amora Gedel = 25 ETB), Millennium Park = 10 ETB) and Burita = 5 ETB) (Gedecho 2015).
Analysis

We collected and analyzed the data using descriptive statistics and econometric techniques. The socioeconomic and demographic characteristics of the respondents, the mean willingness to pay (MWTP), and the recreational value (RV) of TMRP were assessed. We then estimated the MWTP using Equation 1 which was previously used by Anshiso and Teshome (2018) for estimating the WTP of households for the conservation of black cumin at Bale Zone of Oromia Region in Ethiopia.

\[
\text{Mean WTP} = \frac{\sum_{i=1}^{n} \text{WTP}_i}{n} \quad (1)
\]

Where \( \text{WTP}_i \) is the maximum value that a respondent is willing to pay to visit the park and \( n \) is the sample size.

Description of the econometric model

As described above, we asked respondents to accept or reject a randomly assigned bid value for the entrance fee per visit and this estimate was used as an indicator of support for development and management of TMRP. In addition to the proposed random bid value (entrance fee per visit), respondents’ social, economic, and demographic characteristics also influenced the willingness to pay of each individual (Håkansson 2008). Accordingly, as the bid amount varied across respondents, we used a logistic regression model to identify the determinants of accepting or rejecting the randomly assigned bid value (Hanemann 1984). The response set for the model is binary, where 1 represents a “yes” response and 0 represents a “no” response; and the model estimates the likelihood of a “yes” response. The binary logit model is given in Equation 2 below.

\[
\ln \left( \frac{\text{Prob}(\text{yes})}{1 - \text{Prob}(\text{yes})} \right) = \beta_0 + \beta_1 \times \text{BIDAmount} + \beta_i \times X_i + e_i \quad (2)
\]

Where \( X \) is a vector of the respondent’s socioeconomic and demographic characteristics, \( \beta_0 \) is the intercept, and \( \beta_i \)s are coefficients of explanatory variables. According to the principle of demand for normal goods, a negative relationship is expected between demand and price (i.e., coefficient of bid value (\( \beta_1 \)) is expected to be negative).

The probability of accepting the offered bid is estimated as:

\[
P_i = \left(1 + \exp(-z)\right)^{-1} \quad (3)
\]

Where \( P_i \) is the probability of accepting the randomly assigned bid value and \( z \) is the linear combination of the vector of explanatory variables (\( X_i \)), socioeconomic and demographic variables, and the bid value (see Equation 4):

\[
z_i = \beta_0 + \sum \beta_i X_i + e_i \quad (4)
\]

Where \( \beta_0 \) is the intercept, \( \beta_i \)s are coefficients of \( X_i \), and \( e_i \) is the random error (Table 2).

Results

Socioeconomic characteristics of respondents

The survey results in Table 3 reveal that the average age of respondents participating in the survey was 32.67 (±9.9) years and the mean size of dependents of a respondent in the study was 2.44 persons. The mean monthly income of respondents was ETB 3,305.5 per month.

The sex division of the respondents was approximately 57% male and 43% female. Religious affiliation included 51.6% Protestant Christian, 45.9% Orthodox Christian, 2.4% Catholic, and 5.4% Muslim. Respondents of this study had attended at least primary education and 43.5% had a university degree (Table 4).

Importance of Tabor Mountain as a recreation park

To assess the importance TMRP as a recreational site for the city, we asked respondents to express...
their interest in visiting, frequency of visit, and preferred time and day of visiting the park. Accordingly, as shown in Table 5, about 85% reported either having an interest in visiting or were actual visitors and 15% had never visited or were not interested in visiting the park. Moreover, among the respondents who had been visiting the park, 34.4% visited/intended to visit TMRP at least once per month, 21% visited/intended to visit almost every week, and 29% visited/intended to visit the site rarely. More than half of the respondents (57%) reported preferring to visit in the afternoon (starting at noon to late afternoon) while the rest preferred to visit in the morning. In addition, 86% of the respondents expressed a desire to visit Tabor Mountain on the weekend.

Respondents’ WTP for bid values, maximum WTP, and recreational value of TMRP

Proportionally, the ten bid values (ETB 1, ETB 2, ETB 3, ETB 5, ETB 7, ETB 10, ETB 15, ETB 20, ETB 25, and ETB 30) that we estimated based on the entrance fee of similar recreational sites in the city were randomly distributed among respondents. We asked respondents to provide their acceptance or rejection after we explained the proposed development and management scenario for TMRP during a face-to-face interview. Most of the respondents (87.3%) accepted the proposed bid value to visit TMRP while the remaining 12.7% rejected the bid (Table 6). The reason for rejecting the proposed bid values included unaffordability, lack of trust and transparency of such programs, and either over- or underestimation of the proposed bid to support the envisioned development and management of TMRP.

In addition to the agreement and rejection of proposed bid values, respondents were also asked to provide their MWTP to visit TMRP on a per person/per visit basis if the mountain were to be developed and managed as described in the hypothesized scenario. Nearly all respondents (98.1%) had given non-zero amounts for their MWTP to visit TMRP (Table 6). The respondents who did not support (gave zero MWTP) were excluded from estimation of the mean recreational value of TMRP.

The mean MWTP for sampled respondents who give non-zero WTPs was 28.33 ETB per visit. Moreover, respondents who on average gave non-zero WTPs expressed an intention to visit TMRP 2.57 times per month (Table 7).

Determinants of local visitors WTP

The results of the logistic regression used to assess the factors that affected respondents’ WTP to visit TMRP if the park were to be developed and managed as described in the scenario is presented in Table 8. The Wald test was used to test the overall significance of the model and this analysis indicated that the model is statistically significant at the 1% level.

Average monthly income ($p < 0.01$), afternoon visiting preference ($p < 0.01$) versus indifference for visiting time, and Protestant or Orthodox Christianity religious affiliation ($p < 0.05$) versus Catholic had a strong positive effect on WTP. In addition, initial bid value ($p < 0.01$), frequency of visiting ($p < 0.01$), number of dependent individual family members of the respondent ($p < 0.01$), age ($p < 0.05$), and residents who are neither single nor married (i.e., widower or widowed or divorced) were found less likely to accept the specified bid amount to visit TMRP when compared to single respondents with less than 5% significance level. However, distance of respondents’ residence from the park, sex, and education level were insignificant and did not affect WTP (Table 8).

Discussion

We sampled a total of 260 residents to estimate the local recreational value of TMRP and to assess the determinants of residents’ WTP if the park were to be developed and managed as described in the hypothetical scenario. The analysis showed that a majority of local residents (87.3%) was willing to pay the proposed bid (entrance fee) to visit TMRP under these circumstances. With regard to accepting the proposed entrance fee, the findings of this research are similar to the results of a number of other studies (Assefa, Abafita, and Etensa 2017; Lal et al. 2017; Ji et al. 2018; Tule 2019; Aseres and Sira 2020) and inconsistent with work of Trang, Toan, and Hanh (2017). Rejection of the proposed bid value to visit TMRP if it were to be developed and managed as described in the scenario was influenced by a lack of trust in such programs managed by the government and is consistent with the findings of other studies recently carried out in Ethiopia (e.g., Tule 2019; Aseres and Sira 2020). Similar to the results of Eshete (2013), a majority of local visitors usually visit/or prefer to visit TMRP in the afternoon and on the weekend. Regardless of acceptance or rejection of
the proposed initial bid values, 98.1% of the respondents were willing to pay 28.33 ETB per person/per visit if the park were to be developed and managed. This mean WTP per person/per visit (28.33 ETB) was slightly higher in comparison to the mean recreational value (25.77 ETB) found in the valuation study of Amora-Gedel Recreational Park (Tule 2019) and lower when compared with the mean recreational value (38.15 ETB) found for Borena-Sayint National Park (Assefa, Abafita, and Etensa 2017).

If we generalize the results of the survey to Hawassa City’s urban residents, the aggregate annual recreational value of TMRP is approximately 93,498,000 ETB (US$3,167,300). This estimation is predicated on 98.1% (estimate of respondents who gave non-zero MWTP) of the urban residents whose age is 20 years or older (106,950) and living in the urban part of Hawassa City (FEDD Hawassa 2019).

The estimated amount of annual local recreational value indicates the substantial importance of TMRP and calls for development and management of the park.

The research reported in this article also demonstrates that the social, economic, and demographic variables such as monthly income, time preference to visit, and religious affiliation of local visitors have a positive effect on WTP to visit TMRP. Income

| Table 4. Socioeconomic characteristics of respondents (categorical variable). |
| Variable | Category | Frequency | Percentage |
|----------|----------|-----------|------------|
| Gender   | Male     | 147       | 56.5       |
|          | Female   | 113       | 43.5       |
|          | Total    | 260       | 100.0      |
| Marital status | Single | 87        | 33.5       |
|          | Married  | 163       | 62.7       |
|          | Widowed  | 4         | 1.5        |
|          | Widower  | 1         | 0.4        |
|          | Divorced | 5         | 1.9        |
|          | Total    | 260       | 100.0      |
| Religion | Orthodox Christian | 113 | 43.5 |
|          | Protestant Christian | 127 | 48.8 |
|          | Muslim   | 14        | 5.4        |
|          | Catholic | 6         | 2.3        |
|          | Total    | 260       | 100.0      |
| Education level | Some lower primary education (Grade 1–4) | 15 | 5.8 |
|          | Some upper primary education (Grade 5–8) | 29 | 11.2 |
|          | Some high-school education (Grade 9–12) | 59 | 22.7 |
|          | College diploma or equivalent | 44 | 16.9 |
|          | University degree and above | 113 | 43.5 |
|          | Total    | 260       | 100.0      |

| Table 5. Importance of Tabor Mountain for recreational park. |
| Variable | Description | Frequency | Percentage |
|----------|--------------|-----------|------------|
| Interest in visiting Tabor Mountain | Visiting and interested to visit | 221 | 85.0 |
|          | Not interested to visit, so far | 39 | 15.0 |
|          | Total | 260 | 100.0 |
| Frequency of visits to Tabor Mountain | Almost every week | 46 | 20.8 |
|          | At least once a month | 76 | 34.4 |
|          | At least twice a year | 15 | 6.8 |
|          | Once in a year | 20 | 9.0 |
|          | Very rarely | 64 | 29.0 |
|          | Total | 221 | 100.0 |
| Visiting-time preference | In the afternoon | 126 | 57.0 |
|          | Afternoon | 107 | 48.4 |
|          | Late afternoon | 16 | 7.2 |
|          | At noon | 3 | 1.4 |
|          | In the morning | 95 | 43 |
|          | Early morning | 69 | 31.2 |
|          | Late morning | 26 | 11.8 |
|          | Total | 221 | 100.0 |
| Day to visit | Weekend | 190 | 86.0 |
|          | Weekdays | 31 | 14.0 |
|          | Total | 221 | 100.0 |

| Table 6. Respondents’ WTP bid values and maximum WTP to visit TMRP. |
| Variable | Description | Frequency | Percentage |
|----------|--------------|-----------|------------|
| WTP the initial BID values | Yes | 227 | 87.3 |
|          | No | 33 | 12.7 |
|          | Total | 260 | 100.0 |
| Maximum WTP | Non-zero WTP ( > 0) | 255 | 98.1 |
|            | Zero WTP ( = 0) | 5 | 1.9 |
|            | Total | 260 | 100.0 |

| Table 7. Socioeconomic characteristics of respondents who give non-zero WTP. |
| Variable | Frequency visiting TMRP (FQVTMM) | Mean | Standard Deviation | Minimum | Maximum |
|----------|---------------------------------|------|--------------------|---------|---------|
|          | 255                             | 2.57 | 1.74               | 1       | 18      |
| Maximum willingness to pay | 255 | 28.33 | 26.95 | 2 | 200 |
| Age of respondent (AGE) | 255 | 32.64 | 9.97 | 20 | 78 |

1 This estimation is predicated on 98.1% (estimate of respondents who gave non-zero MWTP) of the urban residents whose age is 20 years or older (106,950) and living in the urban part of Hawassa City (FEDD Hawassa 2019). The estimated amount of annual local recreational value indicates the substantial importance of TMRP and calls for development and management of the park.

The research reported in this article also demonstrates that the social, economic, and demographic variables such as monthly income, time preference to visit, and religious affiliation of local visitors have a positive effect on WTP to visit TMRP. Income
had a strong positive impact on the WTP and this indicates that residents with higher monthly incomes were more likely to accept the proposed bid value than lower income counterparts. This finding is consistent with many studies to date (Eshete 2013; Tadesse 2014; Assefa, Abafita, and Etensa 2017; Anshiso and Teshome 2018; Abate, Ewenetu, and Negassa 2019; Tule 2019; Witt 2019; Aseres and Sira 2020) and confirms that recreation income elastic and demand for recreational parks is highly associated with personal income.

The study also revealed that respondents who prefer to visit in the afternoon were more likely willing to pay a larger sum than those who had indifferent visiting-time preferences and people who preferred to visit in the morning. This may be due to the fact that the scenic beauty of Lake Hawassa from the top of TMRP is more attractive in the late afternoon because of the sunset. As expected, the coefficient of the initial bid value was negative and significant implying that an increase in this value reduces the likelihood of accepting the proposed bid level. This result is consistent with the theory of demand for normal goods and the findings of similar studies (Ojeda, Mayer, and Solomon 2008; Tadesse 2014; Trang, Toan, and Hanh 2017; Emiru and Gemeschu 2017; Assefa, Abafita, and Etensa 2017; Anshiso and Teshome 2018). Moreover, variation of WTP was observed among respondents affiliated with different religious groups. This may be because the park is more suitable for certain spiritual practices.

Similar with the work of Kim and Park (2014), Lal et al. (2017), and Aseres and Sira (2020) the number of visits per month was found to have a negative effect on respondents’ WTP. This result is also consistent with the theory of demand for normal goods. However, it contravenes the findings of Tule (2019) and Tameko, Donfouet, and Sikod (2011) that uncovered frequency of visit had a positive impact on accepting the proposed WTP. Age was significant in terms of not accepting the proposed initial bid value and a one-year increase in age decreased acceptance of the bid value by 9.4%. In other words, younger local residents support the development and management of the park more strongly than older members of the community. This outcome may be due to the fact that younger residents are more likely to engage in outdoor recreational activity and/or have high expectations for future use of TMRP. Although this finding is consistent with the work of Tadesse (2014) and Tule (2019), it diverges from the findings of both Kim and Park (2014) and Eshete (2013). Moreover, it is in line with the findings of Tule (2019); individuals with a larger number of dependents are less likely to accept the bid value offered to them when compared to individuals with a smaller number of dependents. However, this finding is inconsistent with the research of Assefa, Abafita, and Etensa (2017).

Finally, our study revealed that individuals who are neither single nor married (i.e., widower or widowed or divorced) were less likely to accept the offered bid value than single residents. This might be related to the affections of single and married residents to visit TMRP with their lovers and/or partners. This finding is inconsistent with finding of Assefa, Abafita, and Etensa (2017) which indicated that married individuals’ probability of accepting the initial bid value for the conservation of Borena-Sayint National Park was lower than it was for those

### Table 8. Logistic regression model results for determinants of respondents’ WTP.

| Variable          | Coefficient | Odds ratio | Robust standard error | z     | p > |J| |
|-------------------|-------------|------------|-----------------------|-------|-----|----|
| BIDVAL            | -0.128      | 0.880      | 0.0221                | -4.55 | 0.000*** |
| FROQVIST          | -0.054      | 0.947      | 0.0174                | -3.11 | 0.002*** |
| AGEREP            | -0.063      | 0.939      | 0.0242                | -2.59 | 0.010*** |
| DISTAC            | 0.035       | 1.036      | 0.0843                | 0.42  | 0.677 |
| NUDDFRS           | -0.492      | 0.611      | 0.1185                | -4.16 | 0.000*** |
| MONINC            | 0.001       | 1.001      | 0.0002                | 5.64  | 0.000*** |
| SEXRES            | -0.289      | 0.749      | 0.5970                | -0.48 | 0.628 |
| MASTRScodes       |             |            |                       |       |     |    |
| Married           | -0.483      | 0.617      | 0.8287                | -0.58 | 0.560 |
| Otherwise         | -2.414      | 0.089      | 0.9691                | -2.49 | 0.013*** |
| EDUCRScodes       |             |            |                       |       |     |    |
| Highschool_education | 0.168   | 1.183      | 0.8327                | 0.2   | 0.840 |
| Higher_education  | 0.226       | 1.253      | 0.7379                | 0.31  | 0.760 |
| TIMVSTorder       |             |            |                       |       |     |    |
| Morning           | 1.299       | 3.663      | 0.7756                | 1.67  | 0.094 |
| Afternoon         | 3.212       | 24.833     | 0.9650                | 3.33  | 0.001*** |
| RELGRScodes       |             |            |                       |       |     |    |
| Muslim            | 1.745       | 5.727      | 1.4879                | 1.17  | 0.241 |
| Orthodox          | 1.990       | 7.314      | 0.9407                | 2.12  | 0.034*** |
| Protestant        | 2.061       | 7.856      | 0.9483                | 2.17  | 0.030*** |
| cons              | 2.198       | 9.004      | 1.5048                | 1.46  | 0.144 |
| Log likelihood    | -45.1317    |            |                       | 0.5438 |
| LR chi2(16)       | 60.29       |            |                       | 0.000  |

*** and ** are significant at 0.01 and 0.05 significance level, respectively.
who were divorced, widowed, widower, and single men and women. Distinct from many studies conducted to date, the educational level and gender of respondents were not significant factors for WTP in our study (Kim and Park 2014; Trang, Toan, and Hanh 2017; Assefa, Abafita, and Etensa 2017; Tule 2019). This may be because of the opportunity of having equivalent information among respondents about TMRP due to its proximity might not significantly vary by literacy level.

**Conclusion**

The results of this study add empirical evidence to the existing economic valuation literature by estimating WTP using CVM based on data collected from local visitors. The insights generated by this analysis add a new perspective to inform policies regarding development and management of environmental and natural resources that consider the potential of local users with respect to sustainable development. We calculated a quantitative estimate of the local recreational value of TMRP that suffers from problems associated with the valuation of public goods and thereby enhances sustainable development and management of environmental and natural resources through alternative financing mechanisms that might be compensated by local capacity. The study also provides information on social, economic, and demographic factors that affect local residents’ WTP. The analysis shows that 106,950 (98.1%) residents of Hawassa City are willing to visit TMRP 2.57 times per month with a mean entrance fee of 28.33 ETB. This generates annual revenue of 93,498,128.46 ETB (equivalent to US$3,167,280.77) in outdoor local recreational value per annum, which creates very considerable potential for development and management of TMRP.

In addition, the binary logistic model revealed that average monthly income, afternoon visiting-time preference, and Protestant or Orthodox Christianity religious affiliation had a strong positive effect on WTP. Moreover, initial bid value, frequency of visiting, number of dependent family members, age, and being widower, widowed, or divorced had a strong negative effect on WTP. Consequently, to promote uniform distribution of visitors and to avoid congestion it is advisable to implement different entrance-fee arrangements based on visiting-time preference and income level. In addition, using different schemes such as family offers, group packages, and other visitor-reward mechanisms might result in better outcomes. Finally, although this research could be a good reference for further valuation studies of recreational parks, the study is subject to limitations on its scope. Because of social unrest in the city between 2018 and 2020, the number of foreign and off-site visitors was limited and only local residents were involved in the study. Therefore, the study would have derived better estimation if nonresident visitors had been included.

To sum up, this study generally uncovered how local recreational service demand is increasing and rising demand can provide an alternative opportunity to promote sustainable development and management of environmental and natural resources in ways that improve the quality of functions and services. Local tourism can be an effective framework for municipalities and other stakeholders to consider as an alternative source of financing to develop and sustainably manage open-access nature-based recreational sites in developing countries. Specially, local financing can be a useful mechanism to offset financial risks for the tourism sector when the contribution of international visitors is constrained such as has occurred during the period of the COVID-19 pandemic.

**Disclosure statement**

The authors declare that there is no conflict of interest regarding the publication of this article.

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**Data availability statement**

The data that support the findings of this study are available from the corresponding author upon request.

**Note**

1. US$1 was equal to ETB 29.52 in 2019.

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Appendix.

### Frequency of bid values

| BID values | Distributed | Acceptance of BID values |
|------------|-------------|--------------------------|
|            | Frequency   | %                        | Frequency |
| 1           | 26          | 10.0                     | 26        | 10.0     |
| 2           | 26          | 10.0                     | 25        | 9.6      |
| 3           | 26          | 10.0                     | 26        | 10.0     |
| 4           | 26          | 10.0                     | 27        | 10.4     |
| 5           | 26          | 10.0                     | 20        | 7.7      |
| 6           | 26          | 10.0                     | 22        | 8.5      |
| 7           | 16          | 6.2                      | 24        | 9.2      |
| 8           | 26          | 10.0                     | 20        | 7.7      |
| 9           | 26          | 10.0                     | 21        | 8.1      |
| 10          | 26          | 10.0                     | 16        | 6.2      |
| Total       | 260         | 100.0                    | 227       | 87.3     |