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**HOW TO PROTECT THE ARGAN TREE IN THE NATIONAL PARK OF SOUS MASSA (NPSM) BY AN ECOTOURISM CIRCUIT: ESTIMATION OF THE WILLINGNESS TO PAY**

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**ABSTRACT**

One of the main challenges of the Argan value chain is the construction of a sustainable system which can help on the development of the sector, its products and protecting the Argan tree. The Souss Massa National Park can play a significant role in this respect, through the promotion of the ecotourism aiming at the protection and conservation of the Argan tree heritage. This study aims at estimating the willingness to pay to visit the Park, in the optics that those payments will be dedicated to the protection of the Argan tree. In this study, the results of a survey based on the contingent valuation method, done with a population from the province of Tiznit and online, show that visitors are ready to pay (WTP) for the proposed services and circuit. According to the Logit model, the results show an average value of WTP ranging from 37.6 MAD, while the Probit model shows an estimated average ranging from 55.1 MAD. By supposing a number of visits going of a pessimistic scenario of 100 000 visitors to a more optimistic scenario of 300 000 visitors, the public authorities can perceive between 3,8 Mdhs to 26,8 Mdhs per year by establishing this willingness to pay as an entrance fee in the park. On the basis of the investigation realized at the level of the province. The Tobit modelling, allowed us to estimate the determining factors of willingness to pay. The factor 'age' has a negative impact on the willingness to pay, while income, distance of the park and the ecological fiber had positive effects. On the other hand, the Web survey allowed us to identify some significant and different parameters, such as the nationality, the marital status, the educational level, the size of the household, the income and the knowledge of the park.

**Keywords:** Argan, contingent valuation, Wiliness to pay, WTP, National Park of Sous Massa.

**INTRODUCTION**

The Moroccan Argan tree is an endemic ecosystem which is facing several constraints such as: drought risk, resource scarcity, market fluctuations and the mode of governance. This tree has an important socio-economic impact and its potential for development is enormous. The Argan tree (*Argania spinosa*) belongs to the family of Sapotacea, and it can be traced back over two million years to the Tertiary Period. This typical tree has a unique deep and wide- reaching root system allowing it to have an excellent use of water in the soil, thanks to its powerful root penetration

and formation of pores. Also, it can raise the groundwater level. The Argan tree can tolerate drought and temperatures of over 50°C by going dormant. At first rain fall, it reactivates different processes that allow it to bloom once again.

The Argan tree has multiple various uses. The very hard dense wood serves as firewood, used for charcoal production and construction. The leaves and young shoots are an excellent food for livestock. The fruit contains a fruit pulp and an extremely hard nut with two to three kernels, from which a premium oil can be pressed. The oil contains over 80% of unsaturated fatty acids, Vitamin A, a considerable quantity of tocopherol (Vitamin E - antioxidants) and a remarkable quantity of sterols (schottenol and spinasterol). The oil is used by humans as a nutrient, but since an immemorial time, it has been also used for skin and hair care, for tending wounds, and as medicine for rheumatism and arteriosclerosis.

The Argan tree grows in the south-west Morocco (western Anti-Atlas). This semi-arid to arid region covers more than 820,000 hectares and presents a wide variety of characteristics.

The Argan tree region covers 6 provinces (Esssaouira, Taroudant, Agadir Ida-Outanane, Inezgane Ait Melloul, Chtouka Aït Baha and Tiznit). Around 2 million people are living in this region, with a density of 46 people per square kilometre. As such, the Argan tree is a sparsely inhabited region with strong focus on agriculture and forestry.

In December 1998, the region got recognised worldwide by the UNESCO as the " Argan tree Biosphere Reserve. The added value of the region increased through the improved use of existing potential consistent with the goals of nature protection and landscape conservation. Those economic systems distinguish themselves through environmental-friendliness and promote most particularly the rational and well managed use of resources.

The Argan oil boom has been a double-edged sword. The development of the sector threatened the Argan trees with overuse and deforestation. Without inciting investments in longer term tree and forest health, the Argan tree will be endangered. The development of UNESCO Biosphere Reserve in Morocco is a step taken in the right direction, also the development of Argan National Parks will be both economically and environmentally critical for the same non-governmental groups, development agencies, and government offices that supported Argan oil production in the first place making sustainability a priority.

One of the main challenges revolving around the Argan tree is the construction of a sustainable project to develop the sector and its products while protecting the Argan forest. National parks, like the NPSM, may have an important role in promoting ecotourism, commercial or cultural activities where the main goal is the protection of the Argan tree. This experience can be generalized to other public or private spaces on the Argan area.

In the midst of these conditions, this study aims to examine the consumer behavior regarding an ecotourism activity in the NPSM by estimating their willingness to pay (WTP) for visiting the NPSM where the main objective is to protect the Argan tree in this area and develop the sector.

This study makes this examination using the contingent valuation method (CVM) applied to the data collected through a survey done in March and April 2016.

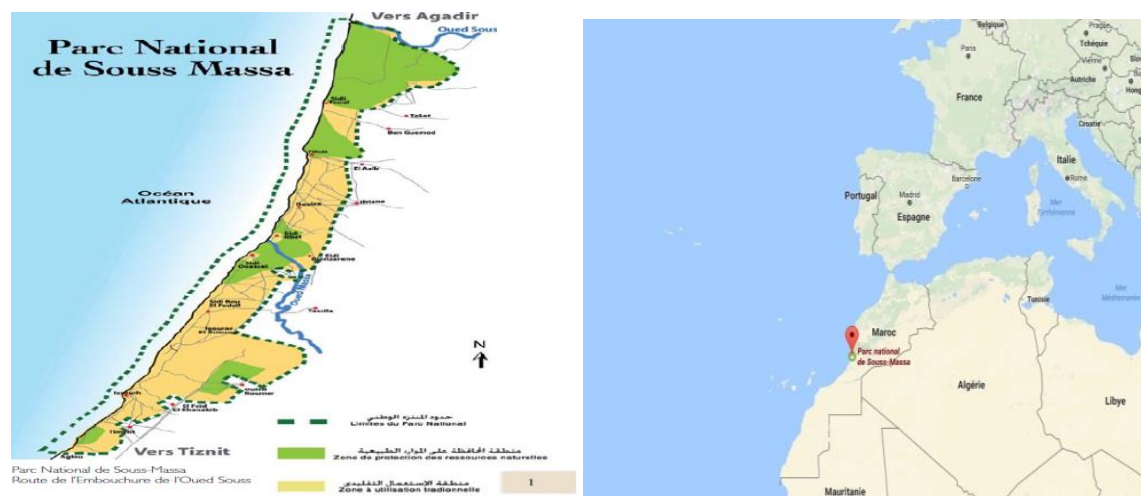
This analysis can be used by decision makers of public policy in Morocco, who seek the protection and development of the Argan tree.

### Case study

#### Presentation of the studied zone: the NPSM tourist circuit

Created in 1991, the Souss-Massa National Park is a very important site of biological and ecological interest to the Souss Massa Drâa area. It is located on the Atlantic coast between Agadir and Tiznit. Its landscape, the faunistic and floristic heritage are remarkably diverse.

It is divided into a forest area (12 350 ha) and private and collective land (21 450 ha). It extends on a coastal strip of 65 km in length and 5 km in width. The NPSM (figure 1) reports administratively to the prefecture of 'Inezgane Ait Melloul', the province of 'Chtouka-Ait Baha' and the province of Tiznit, make in total seven communes.



**Figure 1 : Location of the Souss-Massa National Park**

It should be noted that the NPSM has no source of revenue (entry fee, etc.). The park team is made up of about 20 people operating under the High Commissioner to the waters and forests and combating desertification (Laurent, B., 2011).

#### Characteristics of the NPSM tourism demand

The analysis of the demand regarding the park's tourist circuit has two objectives: quantifying attendance and characterization of the demand. The first one allows us to approximate the level of use of the site in order to evaluate the average number of visitors per year. The second allows the characterization of the demand which consists of identifying the profiles of the visitors and their attitudes.

Attendance analysis allows us to have the average number of visitors per year. It is this value that will be used to monetize the economic value of the circuit.

According to Arnegger, J (2014), a total of 303,026 visitors were registered for the 2007-2008 season. It should be noted that the NPSM is one of the most frequented parks in Morocco. The highest number of visits is recorded during the summer season (holidays in European countries).

The park of Souss Massa for the year 2014 envisaged creating a tourist circuits and ecological products for the valorization of the natural resources such as the Argane museum. (MEF, 2013).

**CVM on Hypothetical Ecotourism Activity in the NPSM**

**Description of the survey**

The questionnaire was administered in the Tiznit zone between April and May 2016. The main steps are the hypothetical scenario, the mode of payment and the socio-economic variables.

According to the scenario, the interviewee emphasized the importance and the richness of the Park, the sustainable management of its resources and the conservation of biodiversity, especially that of the Argan ecosystem. The scenario presents the framework for an assessment of the services given by the current situation and the future projection. Only the price of the circuit varies and is the only instrument available to improve the incomes of the park. "everything else held equal"!

The WTP is obtained by combining the method of referendum and the payment card. The respondent is required to answer 'Yes' or 'No' to the question: "Are you willing to pay to do the circuit?". Then, if the answer is 'Yes', he/she is asked to estimate the maximum value he/she is willing to pay to make the circuit using the payment card method.

Regarding socioeconomic variables, the questionnaire made it possible to collect a certain amount of information concerning the age, sex, level of education, income, marital status ... etc.

Each interview lasted for 10 to 12 minutes and revealed 3 types of information: socioeconomic data on the respondents, information on their behavior and their WTP.

In addition, the present study is based on a sample of 300 people interviewed at the Tiznit and D'Inezgane Ait Melloul zones. These two areas are the most concentrated in terms of population close to the Park, which meant that most respondents are familiar with the NPSM.

**Table 1 shows the distribution of respondents by area and survey site.**

Zone	Site	Num.	Percentage	Total
Tiznit	Aglou	6	2%	150
	Ait lyass	1	0%	
	Amerken	1	0%	
	Ammeln,	5	2%	

	tafraout			
	Bounaaman	17	6%	
	Iferd	2	1%	
	Lakhssas	3	1%	
	Ouladjerrar	1	0%	
	Reggada	43	14%	
	Sidihssainouali	10	3%	
	Tadart	22	7%	
	Tafraout	9	3%	
	Tafsut	1	0%	
	Tighmi	5	2%	
	Tiznit	24	8%	
Inezgane Ait Melloul	Azrou	113	38%	150
	Ait melloul	37	12%	
Total		300	100%	

The Distribution by gender is 56% males and 44% females (167, and 133 respectively). The majority of respondents are Moroccan (99%) against 1% foreigners. According the table below, the majority of respondents (92%) expressed a positive opinion about the project.

Level of agreement	Num.	%
Level 1: Disagree completely	5	2%
Level 2: Somewhat Disagree	19	7%
Level 3: Somewhat agree	96	32%
Level 4: Strongly agree	180	60%
Total	300	100%

Table 2 : Distribution by level of agreement

It should be noted that 276 people expressed a positive opinion to the project, 84% of the overall sample, among them 24 people are not ready to pay and argue that their financial resources do not allow them or that the circuit must be free or that it is not necessary to modify the Park or finally that they do not feel concerned. However, the distribution of respondents according to willingness to pay (Yes / No) shows that 252 respondents answered "Yes" to the question "Do you accept to pay to do the circuit?" while 48 by "No" (Table 2)

**Payment card method**

The payment card is the mechanism chosen to evaluate the WTP. It’s an interesting tool to help respondents formulate their choices. Consequently, the respondent is asked to express his WTP directly from values ranging from zero to 200 Dhs (MAD). The interviewee may choose another value between the proposed values or higher.

Moreover, to obtain a significant average WTP, one must be attentive to the zero values. In the first case, and according to Joel R. and Marie R., 2006, it is necessary to make a clear distinction between the "true" and “false” zeros, corresponding to an absence of variation in the well-being, "false" zeros correspond to an act of protest or an inability to formulate a value, or to the fear of paying for others. To be able to differentiate between "true" zeros and "false" zeros, it is sufficient to ask a supplementary question asking the respondent why they choose zero. Only the "true" zeros should be retained in the analysis.

In our study, in order to determine the true zero WTP, the respondents were asked to clarify their choice in the event of a 'No' answer to the question: “Are you willing to pay to make the circuit?” The responses collected are as follows:

- o The circuit must be free of charge;
- o My financial resources do not allow it;
- o I do not feel concerned;
- o There is no need to change the current state of the park;

Only those who answered "The circuit must be free" were retained when estimating the average WTP. The other responses were considered as protesting and eliminated from econometric processing. Table 3 summarizes the treatment of zeros:

	Num.	Percentage of the initial population
Initial sample population size	300	100%
WTP zeroes	48	16%
true WTP zeroes	19	6%
false WTP zeroes	29	10%
New sample size for econometrics	271	

Table 3: Distribution of WTP zeroes

**WTP Analysis**

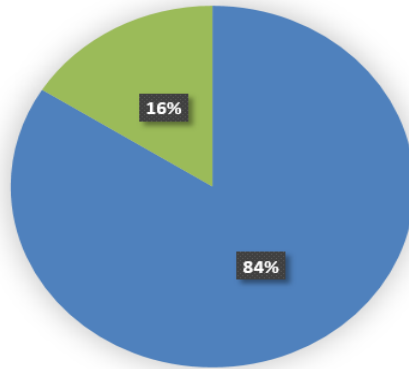


Figure 2: Pie-chart of the willingness to pay

Thanks to the results of this survey, 252 people are willing to pay to do the circuit i.e. 84 % of the whole sample. On the other hand, 48 people aren't willing to pay i.e. 16 % of the sample.

After excluding false WTP zeroes, the effective sample shrinks of about 10 % in size. The new sample size is 271 people. The new distribution of WTP are 19 WTP zeroes and 252 positive WTP. The latter, demonstrated their consent to pay an average of 37 Dhs (MAD) with a median of 20 Dhs (MAD).

The bar graphic displayed on figure 3 shows that the most recurring value is 10 Dhs (MAD) with a headcount of 41 people. In the second and the third place, there's 20 and 15 Dhs (MAD) with respective headcounts of 31 and 30.

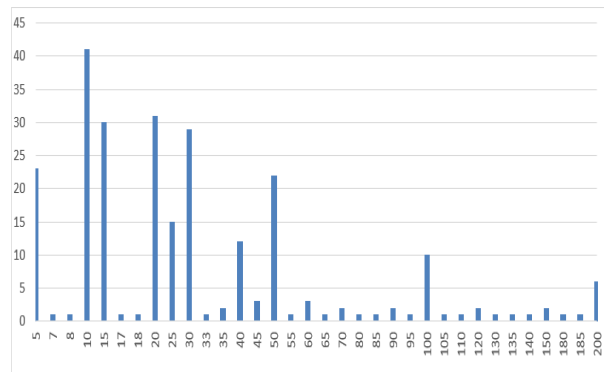


Figure 3: Frequency of WTP

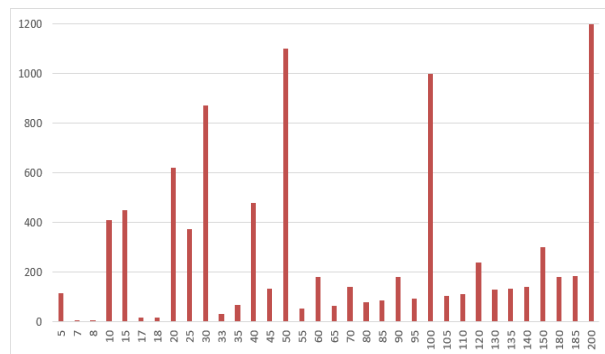


Figure 4: Repetition of receipts

Figure 4 shows that the amount of money collected from all the 252 positive WTP is 9313 Dhs (MAD). A WTP of 200 Dhs (MAD) represents 13% of the total sum of money that can be collected totaling 1200 Dhs (MAD).

The following table shows clearly that the WTP decreases with age, going from a mean value of 77,5 Dhs (MAD) for the 20 y.o. and younger age group, to a mean value of 22,4 Dhs (MAD) for the above 60 y.o.

Age group	WTP			Mean value
	Yes	No	Total	
20 y.o. and younger	10	1	11	77,5
21 to 40 y.o.	133	21	154	46,8
41 to 59 y.o.	94	18	112	22,4
60 y.o. and older	15	8	23	13,7
Total	252	48	300	-

Table 4: Distribution of the WTP by age group

Positive WTP distribution with respect to gender is as follows: 135 males and 117 females i.e. 45% et 39% respectively



	WTP			Mean value
	Yes	No	Total	
Male	135	32	<b>167</b>	44,3
Female	117	16	<b>133</b>	28,5
<b>Total</b>	<b>252</b>	<b>48</b>	<b>300</b>	-

Table 5: Distribution of the WTP by gender

Individuals that expressed a positive WTP are almost equally distributed between males and females (respectively 54 and 46%). On the other hand, females have a lower mean WTP value of 28,5 against 44,3 Dhs for males, i.e. 36% less. According to the education level, the more the interviewee is educated the higher their WTP. This value ranges from 16 to 53 Dhs (table 5).

Education level	WTP			Mean value
	Yes	No	Total	
None	71	12	83	17,3
Traditional instruction	8	3	11	16,6
Primary	44	11	55	28,9
Secondary	16	7	23	43,8
Higher education	113	15	128	52,9
<b>Total</b>	<b>252</b>	<b>48</b>	<b>300</b>	-

Table 6: Distribution of WTP with respect to education level

The value of the WTP increases when the income increases as shown by the following table. It is however worth noting that the number of positive responses does not follow the same tendency.

Income range	WTP			Mean value
	Yes	No	Total	
Less than 600 Dhs	73	17	90	20,7
601 to 1500 Dhs	53	14	67	26,4
1501 to 3000 Dhs	62	9	71	34,8
3001 to 6000 Dhs	24	6	30	49,3
6001 Dhs and more	40	2	42	76,6
<b>Total</b>	<b>252</b>	<b>48</b>	<b>300</b>	-

Table 7: Distribution of WTP with respect to income

**Estimation of the WTP by LOGIT, PROBIT, and TOBIT regression**

Three econometrics models were used, Hanemann's Logit, Probit and Tobit. First, the mean value of the WTP using Hanemann's model (1994) and the Probit model. They reflect the maximum mean value required to build the proposed circuit in the park. Then, factors influencing the WTP will be identified and the Tobit model will be used with the aforementioned independent variable.

**Hanneman's logit model**

The Logit model with a dependent variable with dichotomous values treats the determining factors of the interviewees' WTP. In this case, the variable is discrete and is represented by the closed question (Are you willing to pay to do the circuit? to which the answers can be either « yes » or « no »).

In a binary choice model, we seek to model an alternative ( $y_i=0$  or  $1$ ) and calculate the probability  $P_i$  associated with the event  $y_i=1$  (Bourbonnais R., 2015). Based on the theory of maximization of random utility. Hanemann's model allows the measurement of well-being, using the mean or median values extracted from data on dichotomous choices. The expression of this model is as follows :

$$DAP_i = f(WTP) + \varepsilon_i$$

The model adopted is as follows: Model of logistic regression binary which is defined as follows:

$$F(WTP) = \frac{1}{1 + \exp(-\alpha - \beta * WTP)}, \tag{1}$$

$$\ln \frac{F(WTP)}{1 - F(WTP)} = \alpha + \beta * WTP \tag{2}$$

$$WTP = \frac{\ln \left( \frac{F(WTP)}{1 - F(WTP)} \right) - \alpha}{\beta} \tag{2'}$$

Such as

$F(WTP)$  : is the probability estimated to agree to pay, i.e.  $P(DAP=1)=F(WTP)$

$1-F(WTP)$  : is the probability estimated not to pay, i.e.  $P(DAP=0)=1-F(WTP)$

WTP: is the maximum provision to pay in Dirhams.

$\alpha$  and  $\beta$  are the parameters of the model which we must estimate. Where is the  $DAP_i$  is the variable to explain which takes value 1 if the individual  $i$  agrees to pay and 0 if not ; the dichotomic variable which takes value 1 if the

$i$  individual shows his provision to pay the price  $P$ , and value 0 in the contrary case.

Considering the most common specifications for this type of models (Logit models), the mean value and the median of the WTP are obtained using equations (1) and (2), and are given by the following formulae:

$$\text{Median(WTP)} = (-\alpha) / \beta \quad (3)$$

$$\text{Average(WTP)} = (-\ln(1 + \exp(\alpha))) / \beta \quad (4)$$

Where  $\alpha$  is the constant coefficient and  $\beta$  is the WTP coefficient. The latter corresponds to the unique independent variable in the model of dichotomous choice. The results of this estimation of the WTP using Hanemann's model are gathered in the following table

	Coeff.	E.S	Wald	d dl	Sig.	Exp(B)
Price	-.03349	.001	1861.880	1	0.000	.967
Constant	.92515	.049	358.583	1	.000	2.522

Table 8: estimation of the WTP using Hanemann's model Model validation test :

	$\chi^2$ <i>Khi-chi-deux sig.</i>	$R^2$ de Negelkerke
LOGIT	0.000	0.431

From a statistical stand point, the model is valid since the  $\chi^2$  statistics read in the table is significant for a 5% threshold. Hence, all the model's coefficients are significantly different than 0 (critical probabilities less than 0,05). The adjustment quality of the model is also satisfactory ( $R^2 = 0.431$ ), meaning that 43.1% of the variability is explained by the variable which is the WTP.

From economics' stand point, the models are written as follows:

$$DAP_i = 0.92515 - 0.3349 \times WTP_i$$

Applying formulae (3) et (4) to the data shown on the previous table, all the while exploiting SPSS results concerning estimated probabilities for the Logit model's coefficients, generates the mean values and the median of the WTP in MAD. These results are shown in the next table.

	Total
WTP mean	37.598
WTP median	27.626

Table 9: WTP mean and median according the logit Model

It is then obtained that the mean WTP value of the interviewed population for this project is 37.598 MAD.

**PROBIT modeling**

The theoretical equation of the Probit model is:

$$F(WTP) = \int_{-\infty}^{\alpha + \beta \cdot WTP} \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}} dz$$

Where :

F(WTP) : is the probability to accept paying, i.e. P(DAP=1)=F(WTP)

1-F(WTP) : is the probability to refuse paying, i.e. P(DAP=0)=1-F(WTP)

WTP : is the willingness to pay in Dirhams.

α and β are model parameters that need to be determined.

Where  $DAP_i$  is the variable that takes the value 1 if the individual accepts to pay and 0 otherwise ; the dichotomous variable that takes the value 1 if the  $i^{th}$  individual accepts to pay the price P, 0 otherwise.

Considering the most common specifications for this type of models (Probit models), the mean value of the WTP and the median are obtained thanks to the Hanemann's model, and they're given by the following formulae:

$$Median (WTP) = \frac{-\alpha}{\beta} \tag{3}$$

$$Average (WTP) = \frac{-\ln(1+\exp(\alpha))}{\beta} \tag{4}$$

Where α is the constant coefficient and β is the WTP coefficient. The latter corresponds to the unique independent variable in the model of dichotomous choice.

Modeling the dichotomous question was put in place using the SPSS v20 software. The results of the estimation of the WTP are gathered in the following table.

Parametre	Coeff.	Erreur standard	Z	Sig.	Confidence interval at 95 %	
					Lower limit	Upper limit
Price	-.01679	.000	-46.940	0.000	-.017	-.016
Constant	.42139	.028	15.075	.000	.393	.449

Table 10: estimation of the WTP

Model validation test :

	$\chi^2$ Khi-chi-deux sig.
PROBIT model	0.000

From a statically stand point, the model is valid since the  $\chi^2$  statics read in the table is significant for a 5% threshold. Hence, all the model's coefficients are significantly different than 0 (critical probabilities less than 0,05).

From economics' stand point, the models are written as follows:

$$DAP_i = 0.42139 - 0.01679 \times WTP_i$$

Applying formulae (3) et (4) to the data shown on the previous table, all the while exploiting SPSS results concerning estimated probabilities for the Probit model's coefficients, generates the mean values and the median of the WTP in MAD. These results are shown in the next table

	Total
WTP mean	<b>55.129</b>
WTP median	<b>25.09</b>

Table 11: WTP mean and median according the Probit Model

It is then obtained that the mean WTP value of the interviewed population for this project is 55.129 MAD.

### Analysis of determining factors of the WTP using the TOBIT model

The variables used in the questionnaire can provide an explanation for an individual's WTP for the ecotourism circuit. These variables are: sex, age, marital status, socio-professional category, education level, income, household size, knowledge of the park, distance to the park and the ecological-mindedness.

Tobit models, also known as the censored regression models or truncated regression models are written as follows:

$$WTP_i = \begin{cases} WTP_i & \text{si } WTP_i > 0 \\ 0 & \text{sinon} \end{cases}$$

Where  $WTP_i$  is defined by :

$$WTP_i = \delta_0 + \delta_1 SEX_i + \delta_2 AGE_i + \delta_3 MS_i + \delta_4 SCP_i + \delta_5 EDU_i + \delta_6 NHP_i + \delta_7 INC_i + \delta_8 KOP_i + \delta_9 DFP_i + \delta_{10} EFQ_i + \mu_i$$

$\delta_i$  are model coefficients that must be determined

$\mu_i$  is the model's residue

The model's significant variables are :

Ln\_AGE : Log (Age)

Ln\_Income : Log(income) in MAD

Ln\_Distance : Distance to the park (km)

Fibre\_eco : Dummy variable of ecological sensibility (high / low)

The results are given in the following.

```
Tobit regression                               Number of obs   =      251
                                                F(   4,   247)  =      35.72
                                                Prob > F        =      0.0000
Log pseudolikelihood = -294.70552              Pseudo R2       =      0.1631
```

ln_wtp	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
Ln_Age	-1.298755	.1484664	-8.75	0.000	-1.591176	-1.006333
Ln_Income	.0000921	.0000177	5.20	0.000	.0000572	.000127
Ln_Distance	.0065301	.0015045	4.34	0.000	.0035667	.0094934
fibre_eco	.152829	.0650444	2.35	0.020	.0247166	.2809413
_cons	6.680796	.5315485	12.57	0.000	5.63385	7.727741
/sigma	.7852072	.0420382			.7024082	.8680063

```
23 left-censored observations at ln_wtp <= 1.6094379
228 uncensored observations
0 right-censored observations
```

The significant variables (with a 5 % threshold) are: age, income, distance to the park and ecological-mindedness. The Prob>F is less than 5% (0.000 < 0.05), which means that the model is globally and statistically significant.

The age variable is a determining variable for the WTP, its coefficient is negative (-0.798), meaning that the young are more willing to pay than the elderly. This can be explained by youth's neutrality regarding the park's preservation and thus they're willing to pay more than the elderly who are frustrated by the efforts of public institutions in the preservation of environmental resources.

The WTP follows the same evolution as income. The higher the income, the higher the WTP which shows that the financial aspect has a significant impact.

Distance from the park is also important. That’s to say, the farther away the interviewee is from the park, the more he/she is willing to pay for it. Without being impacted by direct interests with the park, the individual is more objective when distant.

In the same context, the ecological sensibility variable has a visible impact on the WTP. The more engaged individuals are in the protection of the environment the more they're willing to pay. This is explained by the natural engagement of the ecological-minded individual and their desire to protect different ecosystems, the park is one of them.

**CONCLUSIONS & RECOMMENDATIONS**

The environment is an essential component in the definition of a sustainable development policy of natural resources. In this context, the sustainable management policies have to be vectored taking into account the necessity of the improvement of environmental services.

A study has been performed on 300 individuals, 78 of which had previously visited the NPSM i.e. 26 %. Only 271 of the individuals were retained after eliminating false zeroes.

The results of these investigation yields a mean value of WTP of 37.598 Dhs following the Logit model, and 55.129 Dhs following the Probit models. Supposing an annual turn-out of 300 000 visitors for the NPSM, the public authorities can raise an amount varying from 3 759 800 Dhs to 16 538 700 Dhs by establishing this WTP as an entry fee (logit/probit WTP values range of annual turnout from 100000 to 300000).

It is noteworthy that for the period from 2012 to 2013, the NPSM manages a mean budget of 1 274 843,39 Dhs, meaning 193 394 Dhs as a mean operating budget and an investment budget of 1 081 449,30 (MFE, 2014). Public authorities will be able to generate, by setting this WTP as an entry fee, a budget ranging from 5 034 643 17 Dhs to 17 813 543 Dhs.

	Logit results		Probit results	
<b>WTP (in Dhs)</b>	<b>37,598</b>		<b>55,129</b>	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Annual turnout	300 000	100 000	300 000	100 000
Entry fee revenue	11 279 400	3 759 800	16538700	5512900
Mean NPSM budget	1 274 843			
<b>Total</b>	<b>12554243</b>	<b>5034643</b>	<b>17813543</b>	<b>6787743</b>

Table 12: Mena WTP's impact on the NPSM revenue

Tobit models allowed the evaluation of determining factors of the WTP, categorizing positive and negative factors.

Age was seen to have a negative impact on the WTP, while income, distance from the park and ecological-mindedness have positive effects. Other variables such as sex, marital status, socio-professional category, household size and awareness of the park's existence were seen to have no effect on the WTP. In a sustainable development outlook of the NPSM oriented to the Argan tree, this study shows that visitors are willing to pay to benefit from the services of the proposed circuit. The results also show that regardless of the method used for estimating the WTP, the NPSM's budget will increase significantly going up from 3.9 times the current budget to about 14 times that. It's however important to state that the circuit's revenue must be reinjected directly in the maintenance of the protected area. These funds must not be destined to government or any other semi-public institutions. The park's administrators will have more than enough resources to ensure their function. The improvement of the park's budget will have enormous benefits and will contribute significantly in its development. In this framework, the park, thanks to the installment of an entry fee and its different recreational activities, can become fully autonomous and dissociate itself from governmental aid in sustaining its financial health. From a practical point of view, the park can collaborate with the HCEFLCD and ANDZOA to set a sustainable plan for the protection and conservation of the fauna and flora and to promote development on a local scale. The park can invest in projects that ally ecotourism, individual well-being and well-balanced use of resources to ensure the protection of the Argan ecosystem. This win-win relationship must be developed in the park as a pilot project and should then be extended to the entirety of the Argan area in case of its success. Finally, it must be stated that the industry of ecotourism, in spite of the income-generating, does not come without undesirable impacts. If the management and planning efforts aren't carried away properly, ecotourism can have destructive impacts of the vegetation, fauna, flora and the local communities. In Zimbabwe, the rain forest surrounding the Victoria waterfalls is irreparably damaged because of the treading of thousands of visitors on its soil. It was observed that cheetahs modified their hunting behavior because of ecotourism in many Kenyan parks. As a consequence, a win-win situation is a challenge that can easily turn into a catastrophe. The NPSM's administrators must be careful in setting different tourist activities and take into account each activity's long term impact. Furthermore, it is important to enumerate certain limitations of this study. The survey that was carried away concerns mostly people of Moroccan nationality while Arnegger's study in 2014 showed that 53% of the parks attendance is local and 47% of the visitors are foreigners (the majority is from Europe). This study can be improved upon by augmenting the sample size to at least 600 people. A study of this magnitude was carried away by MAMADOU in 2004, entitled «Application of the contingent valuation method for the determination of the WTP for the national bird park of Djoudj». For this reason, the same survey is put online in order to reach this goal and compare the results obtained through different models. In addition, the present study makes it possible to put forward relevant elements of the behaviors and to determine the decentral problems of the behaviors traits of the visitors and to determine the decentral problems of the sustainable development of the park financed be the users. For that, certain measurements must be taken into account and are summarized as follows:



### **Sustainable and autonomous financing of the protected areas**

The park must profit from the sustainable resources guaranteeing its autonomy of management and action. The autonomous budget of the park must cover the total investments rate and the operation of the protected site.

### **Need for the investments in the park**

It arises from the results that the distance negatively acts on acceptance to pay (DAP) to carry out the circuit. This can be explained by the weakness of the offer of visits which do not make it possible to the visitor to occupy all his/her time. Investment in terms of diversification of the performances of service of the park is essential.

### **The application of the rights among the NPSM**

Considering the complexity and the scarcity of the government aid to the development. It is convenient to reconsider the way of managing the park. The import duties for this reason can constitute a powerful bearable management tool of this environmental credit. The import duties can constitute considerable income sources for the management of the protected areas in order to ensure the continuity of the service offering for the benefit of future generations by a consequent management of the resources.

### **Communication with the national visitors' plan**

A study can be carried out to see which are the preferences (utilities) of national visitors. Thus, a plan of marketing must be elaborated in the direction to familiarize the Moroccan visitors to the park and to encourage the interior request (national eco-tourism).

### **Segmentation of the offers**

The tourists who are concerned with the environment tend to have more raised expenditure and are thus uninteresting market segments which until now were not sufficiently valued to the NPSM.

The application of the methodology to the parks as a whole: the application of the MEC to the whole Moroccan visitors of the parks would make it possible to estimate the WTP of the visitors according to the qualities and the characteristics of the parks. This approach will make it possible to have a good economic tool to set up investment projects to the park. The comparative study and the dynamics between WTP and different sites and projects will make it possible to better control the WTP in its space. The change in the WTP will reveal very invaluable information on the behavior of the consumers and their wellness.

### **To satisfy the consumers request**

An offer which meets the requirements with the request is ready to find outlets. That is still true in the environmental case of the service offering. Of course none could object the fact that an

orientation of the state towards the satisfaction of the needs for all the community could not be appropriate for the management of the environmental goods. The argument does not hold in front of the requirements for the sustainability of the resources. The objective of the perpetuation of the resources requires a credit managed better with clear visions and well planned operational objectives. The requirement of intergeneration equity requires the transmission of the goods viable to the future generations y ensuring the needs for the present in an efficient way. Therefore, a balance between request and sustainability is essential.

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