

## **Impact of Nature-based Tourism on Earnings of Local People: Evidence from Keenjhar Lake in Pakistan**

TEHMINA MANGAN and HEMAN D. LOHANO

### **1. INTRODUCTION**

Nature-based tourism is the fastest growing part of tourism [Kuenzi and McNeely (2008)]. Wetland areas including lakes are an important source of nature-based tourism as tourists like their scenic views and enjoy doing different activities including swimming, canoeing, diving and learning about nature [van der Duim and Henkens (2007)]. Wetlands are amongst the most important ecosystems on Earth and provide numerous goods and services including recreational services [Mitsch and Gosselink (2007)]. Increasing demand for nature-based tourism has raised the importance of wetlands.

In the developing countries, millions of people depend on wetlands for their livelihoods. However, due to population growth and lack of alternative livelihood resources, wetlands have been threatened due to over-exploitation of their resources, which, in turn, would affect the livelihood of poor people and lead to increased poverty. In order to break this vicious circle, tourism has increasingly been considered as a possible solution [van der Duim and Henkens (2007)]. Pro-poor tourism can be best strategy for both poverty alleviation and wetland conservation [Ashley, *et al.* (2001)]. According to United Nations World Tourism Organisation [UNWTO (2011)] there are many ways by which the poor can get economic benefits from tourism such as by getting employment, supplying of goods and services to tourism enterprises, direct sales of goods and services to tourists, revenue generation, voluntary support and investment in infrastructure. Poor households have surplus labour that is well suited to tourism activities. Measures can be taken to increase the level of employment of poor people within all kinds of tourism related activities and enterprises including hotels, resorts, transport companies and tourism services.

Keenjhar lake is one of the largest natural freshwater lake of Pakistan. Keenjhar Lake, also known as Kalri Lake, is located in Thatta district. It is 24 km long and 6 km

Tehmina Mangan <teconomist@hotmail.com> is Assistant Professor of Agricultural Economics at Sindh Agriculture University, Tando Jam, Sindh. Heman D. Lohano is Senior Economist with SANDEE in Kathmandu, Nepal and Associate Professor of Economics at IBA, Karachi.

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wide and has an area of 14,000 hectares [WWF-Pakistan (2007)]. The lake has a vital wetland area of great ecological significance and provides habitat for internationally important water birds. Due to its ecological functions and economic, cultural, scientific and recreational value, the lake has been declared as one of the Ramsar sites recognised as the wetlands of international importance under Ramsar Convention in 1971. The lake has also been declared as wildlife sanctuary under Sindh Wildlife Protection Ordinance, 1972. The lake is located 122 km from Karachi city and 19 km from Thatta city in Sindh province. The lake has great scenic beauty and attracts national and international tourists. In the year 2010, the official annual visitor count at Keenjhar lake was 385,000. Tourists pay an entrance fee varying between 2 Pakistan Rupees (Rs) for students and children under five years and Rs 5 for every adult (and additionally Rs 5 for a scooter and Rs 20 for a bus). The revenues from entrance fees are US\$ 38,000 [STDC (2010)]. With proper sustainable management of the recreational facilities at Keenjhar Lake, the number of tourists could be increased and the tourism could become an even more important source of revenues for lake conservation and improvement of the livelihoods of the poor living around the lake.

According to WWF-Pakistan (2007), about 50,000 people from surrounding villages depend on the lake for their livelihood, especially on fishing and tourism. Most of the local people who depend on this lake for their livelihoods are landless and earn marginal incomes for their families. Keenjhar lake and its aquatic ecosystem are seriously threatened by over-exploitation and poor management of the lake. Due to illegal fishing, improper fishing methods, and poor management, the fish stock in Keenjhar Lake is depleting and fishing cannot sustain livelihood of poor people due to reduced catch rates [WWF-Pakistan (2007)]. Thus, these poor people need alternative earning opportunities.

Keenjhar lake has a great potential for nature-based tourism, largely because of its location near Karachi, the most populated city of Pakistan with population over 13 million and among top ten mega-cities of the world [Pakistan (2010)]. Tourism can potentially be an effective strategy that can provide income generating opportunities for local poor people and generate revenue for wetland management and conservation. Thus, for effective sustainable planning and policy-making, there is need to evaluate the contribution of tourism on livelihood of local people. Knowing the economic value of this contribution provides an important indicator of the social desirability of maintaining and further improving the site [Carrier and Macleod (2005)]. Previous studies on contribution of Keenjhar lake have focused on the valuation of various goods and services, especially recreational services [e.g., Mangan, *et al.* (2013); Dehlavi and Adil (2011); Amjad and Kidwai (2003)]. Although these studies have highlighted the importance of tourism by providing recreational value of Keenjhar lake, there is a lack of information on the contribution of tourism towards the livelihood of local people who live in the adjoining areas of the lake and participate in the tourism related work.

The main objective of this study is to investigate the contribution of tourism at Keenjhar lake to local livelihoods. This study attempts to answer the question, do the households who participate in the tourism related work enjoy higher levels of welfare relative to the conditions they would have been in had there been no tourism activities? This study uses econometric model with endogenous dummy variable to investigate the impact of tourism participation on the household earnings of local people. In the

econometric modeling, we account for self selectivity of household's decision whether to participate or not in tourism activities. To our knowledge, this is the first application of endogenous dummy variable model to estimate the impact of nature-based tourism on local livelihoods in Pakistan.

The remainder of this paper is organised as follows. The next section presents a brief literature review. Section 3 specifies the model of this study and estimation methods. Section 4 describes the data used in the study. Section 5 presents the empirical results of the study. Finally, Section 6 draws conclusions and offers their policy implication.

## 2. LITERATURE REVIEW

Poverty has been one of the most complex social challenges facing the world today. A review of literature indicates that poverty and wetland degradation are interlinked [van der Duim and Henkens (2007); Goodwin (2006); Jamieson, *et al.* (2004); Holland, *et al.* (2003); Ashley, *et al.* (2001); Bennett, *et al.* (1999)]. There are many strategies that can be followed for poverty reduction and to improve wetland management and conservation. Tourism can potentially be one of the most important strategies that can provide income generating opportunities for local poor people and can generate revenue for wetland management and conservation. This section provides a brief review of previous studies on the contribution of nature-based tourism towards local livelihoods.

Bennett, *et al.* (1999) highlighted the importance of tourism as a tool for ensuring minimum environmental damage (green tourism), conservation of resources through community-based tourism, and enhancing welfare and wellbeing of poor people.

Guha and Ghosh (2007) examined the contribution of tourism in providing livelihood of the local people in Indian Sundarbans. In this study, household expenditure was compared between tourism participants and non-participants using regression analysis in order to control for other factors. The results of their study showed that the households who participate in tourism activities were found to spend 19 percent more on food items per capita and 38 percent more on non food items per capita as compared to non-participants households.

Leon (2007) evaluated the impact of tourism on rural livelihoods of the Dominican Republic's coastal areas. This study conducted survey of 23 coastal communities covering a range of tourism levels and types and followed the Dominican Republic's Central Bank's methodology to estimate household income. This study used household income as a measure of the standard of living. Results of this study also highlighted that tourism play a very important role in improving the standard of living of people involved in tourism related income generating activities.

Bandyopadhyay and Tembo (2010) in their study on "Household consumption and natural resource management around National Parks in Zambia" investigated the impact of community-based wildlife management and participation in related community institutions on household welfare. They used household and community level survey data from Game Management Areas (GMAs) and other areas near national parks (non-GMAs) and employed Maddala's treatment regression techniques. Their study found significant welfare gains, measured as consumption per capita, in some GMAs but these gains were

unevenly distributed. The welfare gains accrued mainly to the relatively well off, while the poor did not gain. Bandyopadhyay, *et al.* (2004) evaluated the benefits of community conservancies in Namibia based on a survey covering seven conservancies and 1192 households. They divide their study in two parts i.e. evaluation of conservancy impact and evaluation of economic impact of participation in conservancies. They used multivariate analysis method to evaluate the impact of household participation in conservancies. They found a positive impact of conservancies on standard of living of local poor people.

### 3. MODEL AND ESTIMATION METHODS

Keenjhar lake is an important source of livelihood for the poor people living in the adjoining areas of the lake. About 50,000 people from the surrounding villages depend on the lake for their livelihood [WWF-Pakistan (2007)]. Majority of people depend on fishing for their livelihood. Other professions of these local people include providing tourism services, agriculture labour, farming, livestock rearing, stone mining, shop-keeping, business, mat making, transport, teaching, government service, tailoring and nursing.

Local people working in tourism at Keenjhar lake are involved in different income generating activities and provide services such as boating, huts for resting, vending services, swimming dresses, and tour guidance. Local people also work on part-time basis on the restaurants and furnished huts established by the Sindh Tourism Department. Households working in tourism at Keenjhar lake do not entirely depend on tourism-based earnings due to seasonal variation in tourism activities. Annual visitor count at Keenjhar lake is 385,000. During the peak season of summer from May to August, more than 15,000 tourists visit the lake weekly. During the off-peak season of winter from October to January, the number of tourists decline significantly and reach up to 50 tourists per week during very cold days.

Households living in the adjoining areas of Keenjhar lake make a choice whether or not to participate in the tourism related work. This study examines the impact of tourism on the income of households who participate in tourism related work.

This section specifies the model and estimation methods to measure the impact of tourism on the income of households who participate in tourism related work. We first specify a model where participation in tourism related work is assumed to be an exogenous variable. Next we relax this assumption because it is the household's choice whether to participate in the tourism related work or involve in other income generating activities. We then specify an endogenous dummy variable model, where participation in tourism related work is assumed to be endogenous variable.

An early work on self-selection of professions is discussed in Roy (1951) who studied the problem of individual's choice between two professions, hunting and fishing, based on their productivity (earnings) in each. The issue of self-selectivity has also been addressed in the studies on the behaviour of females' labour supply in Gronau (1974) and Heckman (1974).

Endogenous dummy variable model used in the present study has been used in a variety of application. This model has been used for evaluating the impact of participating in natural resource management in Game Management Areas in Zambia on

the household welfare [Bandyopadhyay and Tembo (2010)]. This model has also been applied for measurement of treatment effects and programme effectiveness when there are cross-sectional data. The model presented in this section is based on the conceptual framework for evaluating treatment effects as given in Greene (2012) and Stata (2011).

### 3.1. Model with Exogenous Dummy Variable

To evaluate the impact of tourism, the econometric model is specified as:

$$y_i = x_i\beta + \delta z_i + \varepsilon_i \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

where  $y_i$  denotes annual income of household;  $x_i$  is the vector of explanatory variables including number of earning members of household, value of household's productive asset, average years of schooling of earning members, and average age of earning members of the household;  $\beta$  is the vector of unknown parameters;  $\delta$  is unknown parameter;  $\varepsilon_i$  is the error term representing the unobserved other factors; and  $z_i$  is a dummy variable indicating whether or not the household participates in tourism related work:

$$z_i = \begin{cases} 1 & \text{if household participate in tourism related work} \\ 0 & \text{otherwise} \end{cases} \quad \dots \quad \dots \quad (2)$$

If  $z_i$  is an exogenous dummy variable, then the expected earnings of household who participates in tourism related work are given by:

$$E[y_i|z_i = 1, x_i] = x_i\beta + \delta \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

In this case, the impact of participating in tourism related work on household earnings is:

$$E[y_i|z_i = 1, x_i] - E[y_i|z_i = 0, x_i] = \delta \quad \dots \quad \dots \quad \dots \quad \dots \quad (4)$$

### 3.2. Endogenous Dummy Variable Model

In the above model, the dummy variable indicating whether or not the household participates in tourism related work,  $z_i$ , is assumed to be exogenous variable. However,  $z_i$  is an endogenous dummy variable and is selected by the household as the household makes a decision whether to participate in tourism related work or involve in any other income generating activities. In this case, household's earnings ( $y_i$ ) and decision to participate in tourism related work ( $z_i$ ) are jointly determined by two equations:

$$y_i = x_i\beta + \delta z_i + \varepsilon_i \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (1)$$

$$Prob(z_i = 1|w_i) = \Phi(w_i\gamma) \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (5)$$

where Equation (5) represents a probit model;  $\Phi(.)$  is the standard normal cumulative distribution function; and  $w_i$  denotes the vector of exogenous covariates that may affect household's decision to participate in tourism related work. In this study,  $w_i$  includes a variable defined as distance from household's village to the recreational site of Keenjhar lake. The probit model is represented based on an underlying latent variable model. Let  $z_i^*$  be a latent variable that determines whether or not the household participate in tourism related work:

$$z_i = \begin{cases} 1 & \text{if } z_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (6)$$

We do not directly observe  $z_i^*$  but instead we observe a binary outcome  $z_i$  that depends on  $z_i^*$ , as given in Equation (6). It is assumed that  $z_i^*$  is a linear function of  $w_i$  and a random error term  $u_i$ .

$$z_i^* = w_i\gamma + u_i \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (7)$$

The two error terms  $\varepsilon_i$  and  $u_i$  have bivariate normal distribution with mean zero and the following covariance matrix:

$$Cov = \begin{bmatrix} \sigma^2 & \rho\sigma \\ \rho\sigma & 1 \end{bmatrix} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (8)$$

where  $\rho$  is the correlation between the two error terms  $\varepsilon_i$  and  $u_i$ , and  $\sigma$  is the standard deviation of  $\varepsilon_i$ . The expected earnings of household participating in tourism related work are given by:

$$E[y_i | z_i = 1, x_i, w_i] = x_i\beta + \delta + \rho\sigma \left[ \frac{\phi(w_i\gamma)}{\Phi(w_i\gamma)} \right] \quad \dots \quad \dots \quad \dots \quad \dots \quad (9)$$

where  $\phi(\cdot)$  is the standard normal density function, and  $\Phi(\cdot)$  is the standard normal cumulative distribution function. The expected earnings of household not participating in tourism related work are given by:

$$E[y_i | z_i = 0, x_i, w_i] = x_i\beta + \rho\sigma \left[ \frac{-\phi(w_i\gamma)}{1 - \Phi(w_i\gamma)} \right] \quad \dots \quad \dots \quad \dots \quad \dots \quad (10)$$

In this case, the impact of participating in tourism related work on household earnings is given by:

$$E[y_i | z_i = 1, x_i, w_i] - E[y_i | z_i = 0, x_i, w_i] = \delta + \rho\sigma \left[ \frac{\phi(w_i\gamma)}{\Phi(w_i\gamma)[1 - \Phi(w_i\gamma)]} \right] \quad \dots \quad (11)$$

In this study, the above model is estimated by the maximum likelihood estimation method using 'treatreg' command in Stata 11.2.

The last term in Equation (9),  $\left[ \frac{\phi(w_i\gamma)}{\Phi(w_i\gamma)} \right]$ , is referred to as selectivity correction variable. Comparing Equations (3) and (9) shows that the selectivity correction term is an omitted variable in Equation (3) where the self selectivity of  $z_i$  is not accounted for. If the correlation between the error terms is zero,  $\rho = 0$ , then the Equations (4) and (11) will yield the same results for estimating the impact of working in tourism sector on household earnings. However, if  $\rho \neq 0$  and the selectivity correction term is omitted, then the least squares estimates through Equation (3) would be biased and the impact of working in tourism sector on household earnings given by Equation (4) may be overestimated or underestimated.

#### 4. DATA

To examine the impact of participating in tourism related work on earnings of households, we collected data from two types of households: participants and non-participants in tourism related work. Tourism participant household has been defined as

the household with at least one of its family members earns from the activities directly related to the tourism sector while households having none of its family members engaged with tourism related income generating activities are defined as the non-participants.

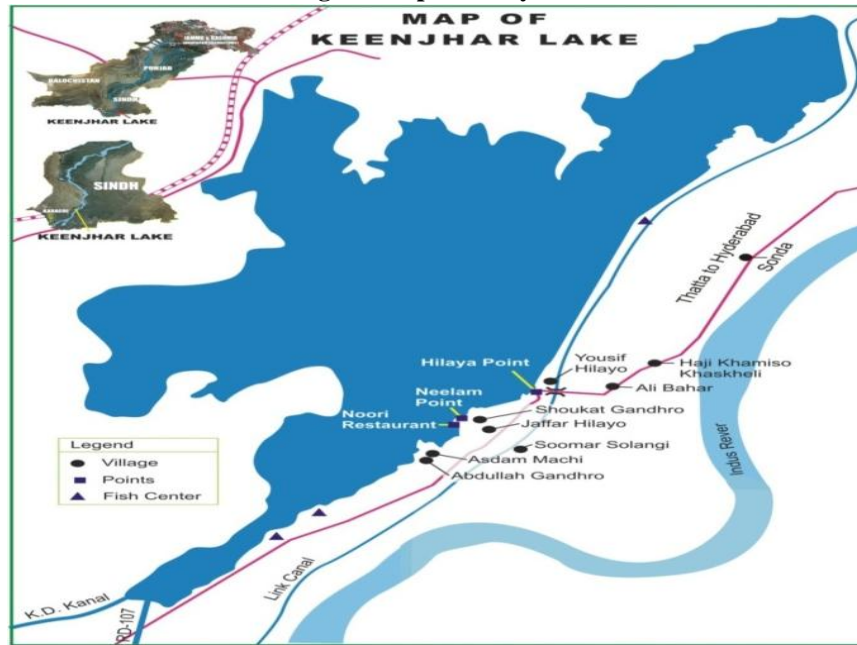
Through a preliminary survey conducted on recreational area, it was identified that tourism related households come only from some of the villages in two union councils, namely Sonda and Ongar. Total number of villages in these two union councils is 44 villages (27 in Sonda and 17 in Ongar). Social mapping of these villages was done to identify villages where both tourism and non tourism households are living. Based on social mapping, we selected six villages: Abdullah Gandhro, Wadero Adam Manchri, Haji Khameso Khaskheli, Yousuf Hilayo, Sonehri, and Jafar Hilayo. These villages are located within 10 kilometers from recreational site in north-east to south of Keenjhar lake. Total population of these six villages is 1345 households. Figure 1 shows the map indicating the location of Keenjhar lake while Figure 2 presents map of the study area where household data were collected.

Stratified random sampling method was used to select 264 households from the selected six villages. From each of these six villages, 44 households were selected with 22 tourism participants and 22 non-participants. In each village, starting at a certain location, surveyors were asked to knock at every third house on their left, alternating between left and right at every turn. In case of non-response, they were asked to knock on the next door.

Face to face interviews of head of the households were conducted using a structured questionnaire pre-tested through a pilot survey of 25 households. The data were collected for twelve months of year. The survey was conducted two times for ensuring the accuracy of data. The first survey was conducted to collect data for six months (March to August 2010) which included peak season of tourism. The second survey was conducted to collect data from the same households for six months (September 2010 to February 2011) which included off-peak season of tourism.

**Fig. 1. Location of Keenjhar Lake**



**Fig. 2. Map of Study Site**

## 5. EMPIRICAL RESULTS

### 5.1. Descriptive Statistics

Table 1 presents the summary statistics to compare the average values of variables between the households who participate in tourism related work and households who do not participate in tourism related work. Simple test of means between both types of households are also included (last column). The results indicate that the average annual earnings of tourism participants are higher than the non-participants by Rs 16,021. However, this difference in earnings cannot be attributed as the impact of the participation in tourism because of the difference in other household characteristics. Partial effect of participation in tourism related work on household earnings can be statistically identified using regression analysis, presented in the next subsection.

Results in Table 1 show that the average household size is statistically not different in both types of households but the number of earning members in tourism participant households is higher than the non-participant households. Average education of earning members is statistically not different while earning members of participant households are younger (28 years) than non-participants households (33 years). However, the average value of assets owned by households is statistically different. On average, the distance from participant households' villages to the recreational site of Keenjhar lake is 2.2 km while it is 3.45 km from non-participant households' villages. Summary statistics in Table 1 also indicate that both groups of households have overall very low earnings, low education level, low value of assets, and large family size.

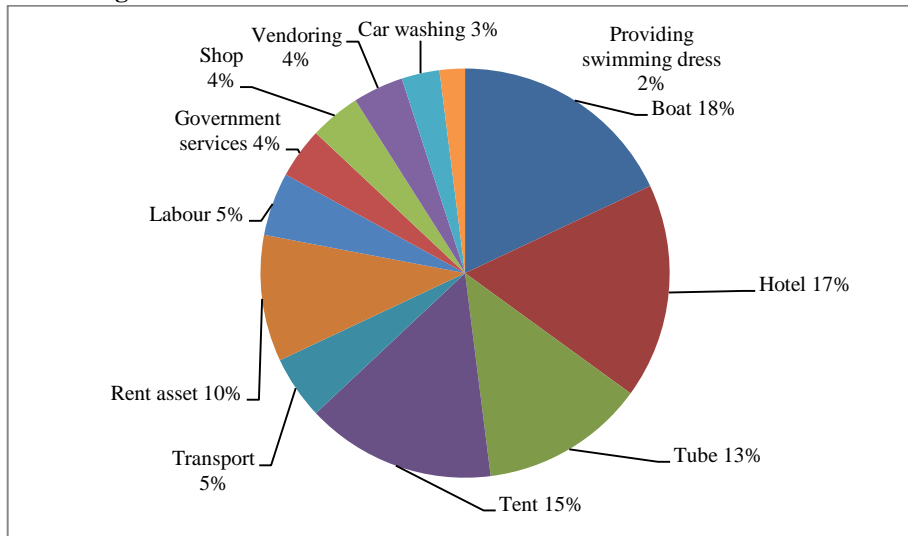


Table 1

*Summary Statistics*

Variables	Definition	Tourism Household (mean)	Non-tourism Household (mean)	Mean Comparison Test (p-value)
Earnings	Annual earnings of household in Rupees	138,412	122,391	0.034
Household Size	Number of family members in household	7.77	7.60	0.664
Earning Members	Number of earning members in household	2.61	2.30	0.047
Education	Average years of schooling of earning members	4.51	4.15	0.610
Age	Average age of earning members in years	28.15	33.80	0.000
Assets	Value of productive assets owned by the household in Rupees	23,440	28,748	0.354
Distance	Distance in kilometers from household's village to the recreational site of Keenjhar lake	2.22	3.45	0.001

Tourism related income generating activities are presented in Figure 3. Providing boating and hotel facilities to the tourists are the highest income earning activities with 18 and 17 percent contribution in the earnings of households, respectively. Providing tent and tubes to the visitors are the subsequent highest incomes earning tourism activities with 15 and 13 percent contribution, respectively. Renting productive assets in tourism business is also a profitable business and makes 10 percent contribution in the earnings. Providing transport and labour services at the recreational site of the lake make 5 percent contribution each. Vendor services, shop keeping and government services account for 4 percent of their earning, while car washing is the lowest earning activity at the lake (3 percent).

**Fig. 3. Income Earned from Tourism Related Economic Activities**

## 5.2. Regression Results

In our model, household earnings depend on the number of earning members, value of productive assets, average age and average education level of earning members. Participation dummy is equal to one if the household participates in tourism related work, otherwise zero. As discussed in Section 3, the household makes a decision whether to participate in tourism related work or involve in any other income generating activities. This makes the decision to participate as an endogenous dummy variable.

Table 2 presents the regression results of three models. Third column of the table presents results of a model where participation dummy variable is assumed to be exogenous. In this case, the model is represented by only Equation (1) with earnings as a dependent variable. Fourth and fifth columns present results of the endogenous dummy variable model. In this model, participation dummy variable is assumed to be endogenous. In this case, the model is represented by two equations: Equation (1) with earnings as a dependent variable and Equation (5) with participation dummy as a dependent variable. For this model, two specifications are presented. In the fourth column, the exogenous variables affecting the participation include distance as well as other variables which also affect household earnings. Following the exclusion restriction, in the last column of the table, the exogenous variable affecting the participation is distance only.

The estimate of the correlation between the error terms ( $\rho$ ) is reported in Table 2. The Chi-squared test results show that this correlation estimate is statistically significant at 1 percent significance level. The test indicates that we have  $\rho \neq 0$  and supports the endogenous dummy variable model. Endogenous dummy variable model is also supported by the Jarque-Bera statistic for normality test for normality of the error term. In this test, the null hypothesis is that the error term is normally distributed. As p-value is much greater than 0.05, the test does not reject the null hypothesis. Thus, the diagnostic tests support the endogenous dummy variable model. As Specification 2 of this model (in the last column of Table 2) satisfies the exclusion restriction, we will discuss and interpret the result of this model.

The results of participation equation in the last column show a negative coefficient estimate for distance variable which is statistically significant at 1 percent significance level. These results show that the likelihood of household's participation in tourism related work decreases when distance from household's village to the recreational site of Keenjhar lake is higher. Results of earning equation in the same column show that the explanatory variables earning members, assets, and education are statistically significant at 1 percent significance level. The estimates indicate that the marginal effect of an additional earning member on household's average annual earning is Rs 13,987.

The marginal effect of productive assets is 0.2, which indicates that any additional Rs 100 investment in productive assets would result in higher earnings by Rs 20. The marginal effect of an additional year of education level is Rs 5,258 on household's average earnings.

As explained in Section 3, the impact of participating in tourism related work on household earnings is given by Equation (11). Results in Table 2 show that the impact of the participation on household annual earning Rs 9,251, which is 7.6 percent of the earnings. These results show that the households who participate in the tourism related

Table 2

*Regression Results*

Dependent Variable	Explanatory Variables	Model with Exogenous	Model with Endogenous Dummy	
		Dummy	Specification 1	Specification 2
<b>Earnings</b>				
	Constant	47,365*** (3.680)	1,091 (0.0622)	24,276* (1.800)
	Earning members	15,619*** (7.219)	15,133*** (6.184)	13,987*** (6.546)
	Assets	0.236*** (4.248)	0.268*** (4.243)	0.204*** (3.718)
	Education	5,523*** (11.61)	5,487*** (10.21)	5,258*** (11.42)
	Age	279.5 (0.937)	1,046*** (2.794)	400.4 (1.371)
	Participation dummy	12,003** (2.317)	58,073*** (5.095)	62,677*** (5.802)
<b>Participation Dummy</b>				
	Constant	—	1.839*** (4.455)	0.360*** (3.586)
	Distance	—	−0.127*** (−4.516)	−0.114*** (−5.126)
	Earning members	—	−0.0546 (−0.757)	—
	Assets	—	−3.87e−06* (−1.953)	—
	Education	—	−0.0114 (−0.742)	—
	Age	—	−0.0381*** (−3.759)	—
	Observations	264	264	264
	R-squared	0.586		
	Goodness of fit F-statistics	73.16***	—	—
	Goodness of fit Chi-Square	—	308.2***	367.3***
	Correlation between error terms ( $\rho$ )	—	−0.655***	−0.704***
	Jarque-Bera statistic for normality test	11.88	0.298	0.434
	p-value of above	0.003	0.861	0.805
<b>Impact of Participation in Tourism on Earnings</b>				
	Impact in Rupees	12,003	9,051	9,251
	Impact in percentage	9.8	7.4	7.6

t-statistics in parentheses.

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1.

work enjoy 7.6 percent higher level of earnings relative to the conditions they would have been in had there been no tourism activities. When the participation dummy variable is assumed to be exogenous, the impact of the tourism participation on household annual earnings is Rs 12,003 (9.8 percent of the earnings), which is overestimated as the correlation between the error terms ( $\rho$ ) is statistically significant. In endogenous dummy variable model, the results of two specifications are similar. The impact of the tourism

participation on household annual earnings is 7.4 and 7.6 percent, respectively. Results of this study show that tourism at Keenjhar lake makes a positive contribution in the earnings of the poor local people and in sustaining their livelihoods.

Results of the present study are similar to those in the study by Bandyopadhyay and Tembo (2010), which also shows that tourism has positive impact on overall welfare of households. Findings by Ashley (2000) are also supported in the results of this study. Ashley (2000) found that tourism has positive impact on livelihoods of rural people and generally generates various types of cash income for rural households.

## 6. CONCLUSIONS AND POLICY IMPLICATIONS

This study examines the impact of nature-based tourism on the livelihood of local people at Keenjhar lake in Pakistan. For this study, primary data were collected from 264 households selected by stratified random sampling method. This study applies endogenous dummy variable model to evaluate the impact of households' participation in tourism related work on their earnings.

Results of this study show that the households who participate in the tourism related work enjoy 7.6 percent higher level of earnings relative to the conditions they would have been in had there been no tourism activities. Study finds that tourism at Keenjhar lake makes a positive contribution in the earnings of the poor local people and in sustaining their livelihoods. Furthermore, the estimates of marginal effect of productive assets indicate that any additional Rs 100 investment in productive assets would result in higher earnings by Rs 20. Education level of earning members also increases the earnings of the household.

This study finds that tourism at Keenjhar lake improves the standard of living of local people by raising their earnings, and that the nature-based tourism can be an effective poverty alleviation strategy.

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