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ECONOMIC AND ENVIRONMENTAL IMPACT ON TOURISM: EMPIRICAL EVIDENCE FROM PAKISTAN

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ABSTRACT

One of the largest and fastest-growing sectors of the global economy is tourism. This industry contributes significantly to national growth. This study explores the impact of environmental and economic factors on tourism in Pakistan from 1995 to 2020. Augmented Dickey-Fuller unit root tests were used to determine whether the variables under investigation were stationary. Data analysis was performed by using an OLS estimation procedure. The main finding of this study demonstrates that the economic variable has a positive and considerable impact on tourism, while the environmental variable has a negative but significant impact. This study suggests that the govt, as well as private sectors, should make the environment clean and ensure the safety of the tourists. The improved law-and-order situation will undoubtedly attract more tourists and improve Pakistan's status**.**

INTRODUCTION:

Tourism initiatives are assumed to be one of the key sources of economic growth. It can be considered as a system of generates money and jobs in both the official and unofficial sectors. The tourist industry helps to augment the foreign exchange gains from trading in commodities, and it may also be used to help pay for the capital goods needed to expand the industrial sector. However, the rapid economic boom in advanced economies encourages

international travel (business travel), which raises the country's foreign reserve. The relevance of international tourism has grown during the last several years in many global economies. The world tourism organization (WTO) reported that 693 million international visitors spent $462 billion in 2001, or nearly 1.3 billion dollars per day globally. As an alternative to exports, tourist spending has also helped many countries' balances of payments by generating foreign exchange revenues. Through multiplier effects, tourism's rapid expansion increased government revenues and family incomes both directly and indirectly. This improved the balance of payments and encouraged government measures that supported tourism. As a result, the increase in tourism has typically been seen as contributing favorably to economic expansion. (WTTC, 2018).

Pakistan is a beautiful country and blessed with beautiful places. Few places on the earth possess the magnificence and majesty of the northern region of Pakistan. The magnificence and grandeur of Pakistan's northern region can be found in just a few locations on earth. Northern Pakistan continues to be a country of contrasts, distinct in the history of its landlocked culture, and gifted like no other place with an incredible variety of some of the most spectacular lakes, valleys, mountains, and rivers. The Hindukush-Himalayan region of Pakistan is one of the few places in the world that provide such a singular combination of amazing natural beauty and great diversity of history, socioeconomic traditions, culture, and lifestyle. In addition, Pakistan offers enormous potential for safari tourism.

Pakistan's tourism industry has a great ability to grow; in 2005, nearly 42 million domestic travelers visited the country. The majority of tourists (almost 90%) traveled by road, almost 8.5% preferred train and just 1.8 percent by air. The socioeconomic development of the country has been significantly influenced by the tourism industry, which also has a bright future and the ability to grow. See Samina, K., & Kakar, M. K. (2007). Tourism contributed to the establishment of around 4 million employment and contributed 5.9% of the nation's GDP in 2019. The world was struck by a pandemic during the first quarter of 2020, but this year tourism in Pakistan breaks all previous records. Pakistan earned 765 million US dollars from tourism in 2020. After this, the British Backpackers Society ranked the country as the third-best adventure destination in the world for the next year. In addition to this, the industry has been forecasting and experiencing unprecedented every year growth. Long-term evidence of growing, worldwide interest in Pakistan was the doubling of the number of foreign visitors between 2013 and 2016. (See Mahrukh Mosin, 2021). Pakistan has experienced a record boom in tourist arrivals from 2018 -2020. Approximately 1.9 million tourists visited Pakistan. The number of visitors to the country would have risen by more than 300%. (See Joan Torres, 2020). Despite considerable recent fluctuations, Pakistan's tourist earnings generally increased from 2001 to 2020, reaching 765 million US dollars in 2020. (See Knoema). To attract more international tourists, the government of Pakistan takes some good steps. Pakistan removed the No Objection Certificate (NOC) condition for all visitors. The country is now open to unrestricted movement for visitors. They

also introduced the e-Visa facility for 175 Countries and also announced a Visa on Arrival policy.

The condition of the environment, both natural and artificially has an impact on tourism. Therefore, Tourism and the environment have a complicated connection. Numerous of its components have the potential to harm the environment. Numerous of these effects are linked to the development of services associated with tourism, such as resorts, hotels, cafes, shops, country clubs, and marinas, as well as more basic infrastructures like highways, roads, and airports. The damaging effects of tourism expansion can quickly destroy the resources of the environment. On the other perspective, by promoting environmental safety and conservation, environment-friendly effects from tourism are possible. It promotes environmental values and may be employed to support funding for the preservation of natural places as well as increase their economic worth.

Numerous elements have a significant impact on tourism. Regarding the geographic, geological, environmental, political, and economic structures, these elements may change across countries. This study aims to analyze the economic and environmental impacts of tourism in Pakistan from 1995 to 2020. This study would be valuable for investors and policymakers to build sound policies for Pakistan's development as well as for achieving sustainable tourism in Pakistan.

LITERATURE REVIEW:

Many established and developing countries consider tourism a major factor in economic growth and employment. Many researchers agree on the importance of tourism and how it contributes to the economic growth of the country. However several studies on tourism are available in the literature, some of these are as: Meo et al. (2018) investigated the asymmetries impact of inflation, exchange rates, and oil prices on tourism demand in Pakistan. They found a long-run asymmetric association between exchange rate, oil prices, tourism demand, and inflation. Jawaid et al., (2019) studied international tourism and consumer prices in Pakistan by using Co-integration and wavelet transformation. Rasheed et al., (2019) analyzed the long-run relationship between deficit in the Balance of Payments (BOPs) and tourism by using the Autoregressive Distributed Lag (ARDL) model. Awan et al., (2019) studied the association between the socio-economic factors and the tourist industry in Pakistan. Liulov et al., (2020) presented the relationship between tourism and economic growth by using the extrapolation model ARIMA. Results refer to the impact of overcoming the collapse of the tourism industry in situations of social, economic, and political tension. With this, there is a little upward trend in the recovery of tourism. To see the mathematical simplicity, the researchers choose to estimate the regression using the ordinary least square (OLS) approach to determine the connection between dependent and independent variables. However, Aleemi (2015) analyzed the impact of tourism receipts on the economic growth of Pakistan by using a regression model. The results showed that the country's economic growth had significantly and positively impacted by tourist receipts. Using OLS and empirical Bayesian estimate techniques, Rashid et al. (2017) and Basheer et al. (2019) investigated the

effect of mergers on corporate financial performance in Pakistan. Basheer, (2014) used OLS estimation to analyze the effects of total imports to GDP ratio, exports to GDP ratio, trade openness, investment to GDP ratio, inflation, and terms of trade on the economic growth of Pakistan and concluded that foreign trade may be a significant role in enhancing Pakistan's economy.

DATA and METHODOLOGY:

This study is designed to check the impact of different economic and environmental variables on tourism in Pakistan, the annual time series data from 1995 to 2020 is taken from the World Bank. The primary data analysis is based on data description, and unit root test to identify the stationarity of the series. Mostly, time-series work under the assumption of stationarity. Therefore, Dicky Filler's (1979) test is applied for stationarity checking. Then we use the OLS estimation method to check the impact of the independent variables on a dependent variable. Moreover, we take the Economic variable (Exchange rate and GDP) and environmental (Temperature and CO_2) Independent variables while the dependent variable is Truism Receipts. To check whether the model is a good fit or spurious some Diagnostics tests are applied such as the unit root test is applied to test the residual stationarity, the LM test for serial correlation, The ARCH test for heteroscedasticity, and the CUSUM test applied to detect whether the model is stable or not. For statistical analysis and a graphical representation, E-view 9 and MS-Excel are used.

The model applied in this study is discussed in the following Section

Ols Estimation

Regression theory focuses on analyzing the relationship between one or more independent variables and a dependent variable to estimate and/or forecast the mean or average value of the future based on known previous values bin Hidthiir et al. (2019). Because it is the best method for estimating multiple regression models and provides reliable regression findings. However, the researcher estimated the regression by using the Ordinary Least Square (OLS) method (see Gujarati, 2003). To figure out the effect that the percentage change in the environment and economy had on tourism, the regression model shown in the equation below

$$\boldsymbol{Tour = \beta_0 + \beta_1 GDP + \beta_2 EXR + \beta_3 Temp + \beta_4 CO_2 + u}$$

$\boldsymbol{Tour}$ is the Tourism receipts (% of total exports), GDP is Gross domestic products (annual %), $\boldsymbol{EXR}$ is the Official Exchange Rate (LCU per US$, period average), $\boldsymbol{Temp}$ is the average temperature (annual average %) and $\boldsymbol{CO_2}$ is Carbon dioxide emissions (kt). Coefficient $\boldsymbol{\beta_0}$ is Intercept while coefficients $\boldsymbol{\beta_1}$, $\boldsymbol{\beta_2}$, $\boldsymbol{\beta_3}$, **and** $\boldsymbol{\beta_4}$ are independent variables and u is a term for error.

Coefficient of Determination (R^2)

R-squared is a statistic that expresses how closely the data follow the fitted regression line. For multiple regression, the multiple determinations coefficient is the other name of it. R^2 Measures the percentage of the reaction variables fluctuation that a linear model can account for.

$$R^2 = \frac{\text{Explained Variation}}{Total\ Variation}$$

R^2 is always in the range of zero and 100 percent. 0% means that no variance in the response data around its mean is explained by the model. 100% denotes that the model completely accounts for all variances in the response data around the mean. In general, the higher the R^2gives the best fit (Gujarati, 2003).

Jarque-Bera (JB) Tests of Normality

The JB test is used to determine whether a variable is normal. This test initially determines the kurtosis and skewness of the OLS residuals. The model's statistic is given as:

$$JB = n\left[\frac{S^2}{6} + \frac{(K-3)^2}{24}\right]$$

Kurtosis coefficient = K, Skewness measure = S, and sample size = n. It is a test of the joint hypothesis where the distribution of the variable is S = 0 and K = 3. Consequently, kurtosis and skewness are each 3 and 0 respectively. Moreover, K~AN(3, 1/24) and S~AN(0, 1/6) consequently JB statistics fallows Chi- Square distribution with 2 degrees of freedom (Gujrati, 2004).

Serial Correlation LM Test (Breusch-Godfrey):

Breusch-Godfray developed a test for autocorrelation that takes into account higher-order autoregressive schemes like AR(1) and AR(2) as well as non-stochastic repressors such as lagged values of the regressand (Gujrati, 2004). The underlying hypothesis is:

H_0 = The error term has no autocorrelation
H_1: The error term exhibits autocorrelation

Heteroscedasticity Test

It is tested for heteroscedasticity to see if the variance of the residuals is constant. The ARCH technique was used to do a heteroscedasticity test to see if error terms from prior periods have any impact on future periods (Kirchgassner and Wolters (2007).

The test's hypotheses are:

H_0: Heteroskedasticity not present
H_1: Heteroskedasticity is present.
If the Chi-square value > critical value then the null hypothesis is rejected otherwise accepted.

CUSUM and CUSUM-square Test

The cumulative total of the recursive residuals serves as the basis for the CUSUM test, while the CUSUM square is the cumulative total of the square of the recursive residuals. CUSUM plots the 5% critical lines and the cumulative total. If the cumulative total lies in the region between the two crucial lines, it indicates parameter stability.

RESULTS AND DISCUSSION:
Figure 1 displays the plots of all series at level, which show the nonstationarity of the data. Lag difference series are shown in Figure 2 with stationary patterns for each series. The augmented dickey-fuller (A.D.F) test for unit root is also used to inspect the stationarity of the data set, and the findings are shown in Table 1. All of the series are stationary at the first lag difference except the Exchange rate series which is stationary at level 2.

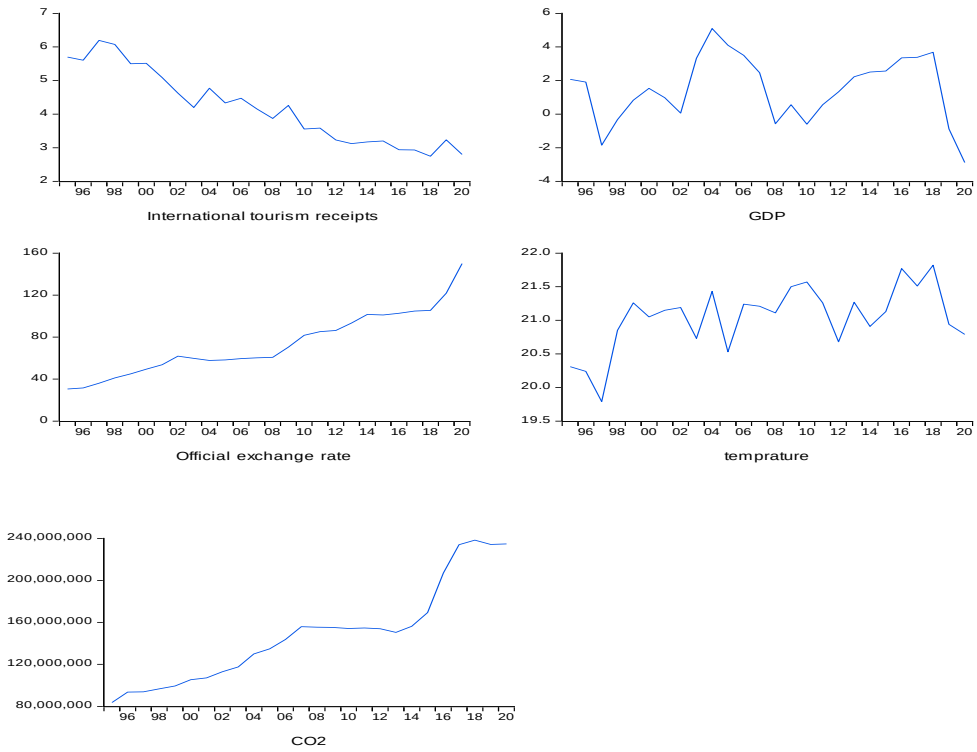

Figure 1: Plot of All Series at level

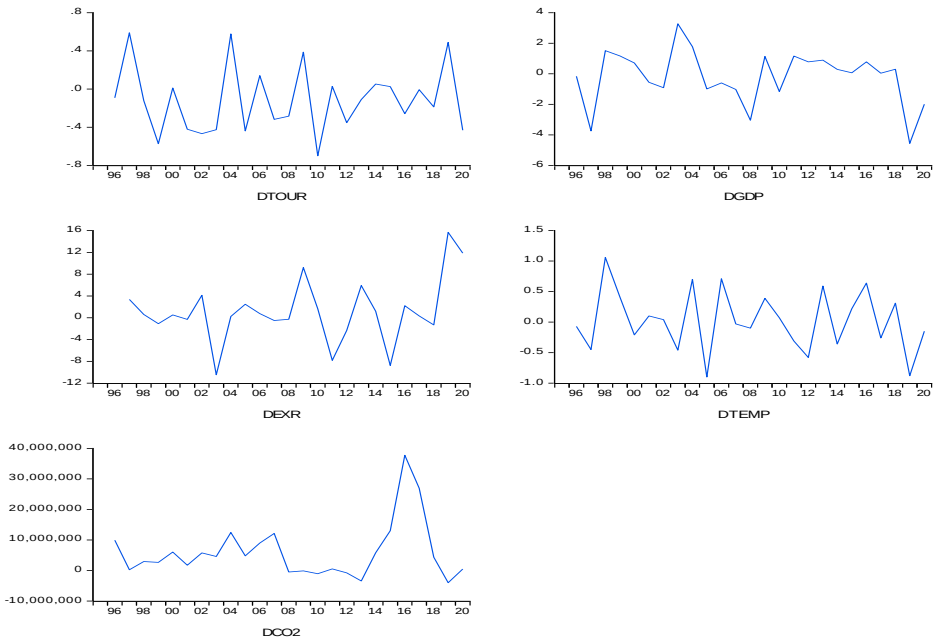

Figure 2: Plot of All Series after Lag Difference.

We used the ADF test to examine the stationarity of the series and nonstationarity shown in Table 1. No rejection of the H_0 in the unit root test is taken as evidence of the nonstationarity of the series.

Table 1: Results of Unit Root Test

A.D.F Test	t-statistic	Probability
Tourism	-1.782112	0.0714
GDP	-1.017191	0.9225
Exchange rate	-3.200766	0.1070
Temperature	-3.549983	0.0600
CO_2	-4.653631	0.0674

After this, the study moved on to an assessment of the multiple regression model. To do this, diagnostic tests have to be performed to ensure the validity of the regression coefficients. Table 2 shows the A.D.F results for residuals which ensure the stationarity of the residuals series showing the model is not spurious.

Table 2: Unit Root Test for Residual

A.D.F test	T-Stat	p-value
Residual	-3.911123	0.0312
Critical values	1% level	-4.498307

The residuals are normally distributed, according to the JB normality test given in Table 3. The p-value of Jacque-Bera(JB) is higher than the level of significance at 5%. The confirmation of residual normality ensures that the estimated regression model has reliable predictive abilities, and its results can be used to make reliable predictions.

Table 3: Normality Test for Residual

Jacque-Bera(JB)	Test value	p-value
Residual	1.258486	0.532995

As shown in Figures 3 and 4, results from the autocorrelation test by using the correlogram of residuals and squared residuals ensure no autocorrelation and heteroscedasticity in the model.

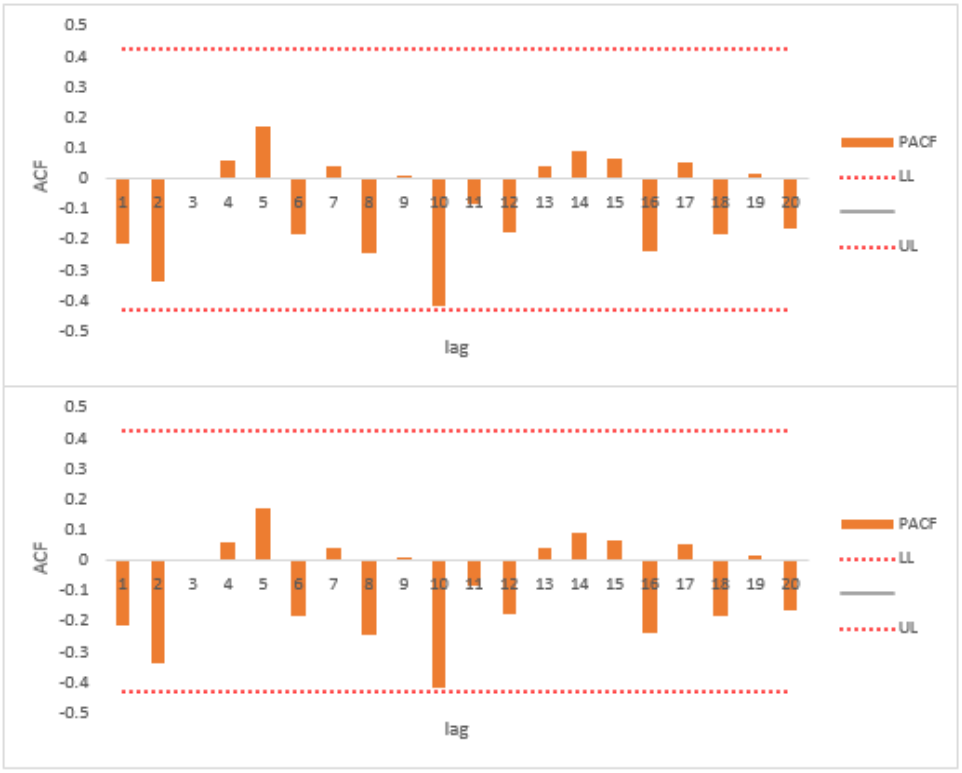

Figure 3: Correlogram of ACF and PACF of Residuals

Figure 4: Correlogram of ACF and PACF of Squared Residuals

The Breusch-Godfrey LM Test for serial correlation is accessed in Table 4. The p-value is higher than the tested value however the H_0 is accepted and ensures that there is no serial correlation between the variables.

Table 4: Breusch-Godfrey LM Test Results

F-stat	Prob. F(2,14)	Obs. R^2	Prob. χ^2
0.219367	0.8057	0.638104	0.7268

When discussing heteroscedasticity, the PACF, ACF, and standardized residuals help assess and recognize the presence of heteroscedasticity in the model. The ARCH test is another method for determining whether heteroscedasticity exists. Heteroscedasticity test results shown in Table 5, expose that there is no heteroscedasticity ($Prob.\chi^2 = 0.9270$ is larger than the critical p-value of 5%).

Table 5: ARCH Test Results

F-stat	Prob.F (1,18)	Obs. R^2	Prob. χ^1
0.007564	0.9317	0.008401	0.9270

To verify whether or not the model is stable, the CUSUM test for residual and squared residual has been performed. The residual's CUSUM and CUSUM squares are plotted in Figure 5. The CUSUM value and the CUSUM square values are within the significant bounds (5% significance), demonstrating the stability of the model.

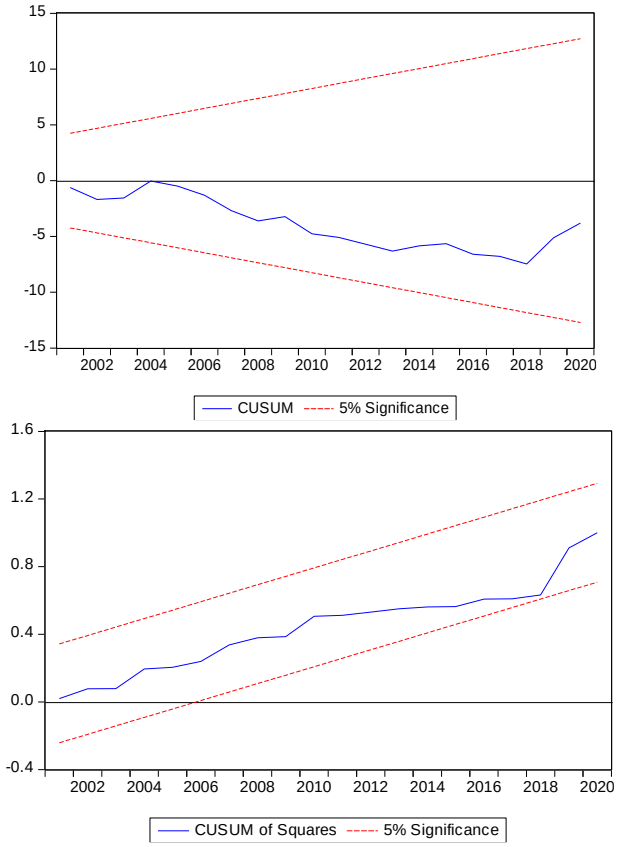

Figure 5: CUSUM for Residual and Square Residuals.

The results of different diagnostic tests have confirmed that the regression is not spurious. Therefore, the analysis moved on to the estimate of the regression equation after confirming that there is a connection among the variables. The regression results for the relationship between tourism, GDP, EXR, temperature, and CO2 are shown in Table 6.

Table 6: Results for OLS Regression

variable	coefficient	SE	t-Stat	Probability
GDP	-0.047804	0.039787	-1.201481	0.2470
EX	0.026791	0.006262	-4.278126	0.0006
CO_2	-1.580018	5.170900	-3.052136	0.0076
temp	0.132093	0.179440	0.736143	0.4723
β_0	5.527245	3.571259	1.547702	0.1412
R^2: 0.950197		Adjusted R^2: 0.93774		
F-stat: 76.31577		Prob (F-stat): 0.000000		

The estimated model is as follows, based on the regression results:

ITR= 5.5272- 0.0478 GDP+ 0.0268 EXR -1.580018CO_2+ 0.13209Temp + μ

CONCLUSION:

The study aimed to analyze the impact of different economic and environmental variables on tourism in Pakistan. The study was based on econometric research of time series from 1995 to 2020. The A.D.F test shows that GDP, Exchange Rate, CO2, and Temperature are nonstationary but it's become stationary at the 1st and some are 2nd difference. OLS regression results show that both exchange rate and CO_2 variables under study have a significant effect on tourism while the GDP and temperature are insignificant also temperature and exchange rate put a positive effect on tourism while the GDP and CO_2 put a negative effect. Accordingly, a 1% increase in exchange causes a 0.026791 percent gain in tourism, whereas a 1% increase in CO2 causes a -1.580018 percent drop, all other factors being equal. This suggests that CO2 and the exchange rate both affect tourism. Temperature put a positive but not significant effect while The GDP puts a negative effect but is also not significant. The Adjusted R^2 was 0.93774 which explains that the overall model is the best fit. Thus based on empirical results, we conclude that the exchange rate has a positive noteworthy effect on tourism while CO_2 has a significant effect but negatively.

RECOMMENDATIONS:

Based on results derived in this study, it is strongly recommended that the government of Pakistan should take beneficial actions to encourage tourism and develop the trust of both domestic and foreign tourists as well as investors. Government should certify the safety of the tourists by getting rid of terrorism. The government should use social media to advertise all popular tourist destinations. A health and rescue system would be available every time in tourist destinations. The improved law-and-order situation will undoubtedly attract more tourists and improve Pakistan's economy**.**

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