Urbanisation, local food crop production and tourism output of Pakistan

Suwastika Naidu, Atishwar Pandaram and Anand Chand

1. Introduction

Similar to the economic context of many large developing countries, the tourism sector of Pakistan plays a key role in its economic development activities (Adnan *et al.* 2013). It provides both direct and indirect benefits to the national economy of Pakistan, including job creation, contribution to government tax revenue, infrastructure development, and poverty reduction. In 2014, the tourism and travel industry of Pakistan contributed 2.9 per cent of the gross domestic product (Khalil *et al.* 2007). According to the World Travel and Tourism Council (2015), it is expected that the travel and tourism industry of Pakistan will provide employment for 1.76 million people in the coming decade.

Dr. Suwastika Naidu is a senior lecturer in the School of Management and Public Administration, University of the South Pacific, Suva Fiji Islands.
Email: suwastika.naidu@usp.ac.fj
Dr. Atishwar Pandaram is a lecturer in the School of Management and Public Administration, University of the South Pacific, Suva Fiji Islands.
Email: pandaram_a@usp.ac.fj
Professor Anand Chand is the Head of the School of Management and Public Administration in Facility of Business and Economics at the University of the South Pacific, Fiji. He has a Master's degree from Manchester University and a PhD from Cardiff University, UK. His area of expertise is HRM and Employment Relations. His area of expertise is HRM, Employment Relations, Industrial Relations. Anand has published 2 books, 2 monographs and more than 60 articles in highly in ranked journals.
Email: chand_a@usp.ac.fj

Moreover, there are a number of reasons why tourists visit Pakistan. One of these reasons is to experience the authentic food and culture of the Pakistani people. On one hand, it can be argued that the growth of the tourism industry is guaranteed if efforts are made by stakeholders in the industry to work with local communities and farmers who produce local and authentic goods and services (Khalil *et al.* 2007). On the other hand, there will be an economic trade-off between infrastructure development and local crop production if land resources are devoted to farming practices with the goal of maximising local produce for the travel and tourism industry. Undoubtedly it is crucial for policymakers to know the right mix of infrastructure development and local food crop production that may be needed to maximise the growth of the travel and tourism industry (Khalil *et al.* 2007). Furthermore, urbanisation is another factor that may constrain infrastructure development for tourism purposes. The rapid increase in urban population leads to urban sprawl that consumes urban resources that could be allocated to tourism infrastructure development (International Growth Centre, 2019; Qureshi and Lu 2007). Alternatively, urbanisation can also have a positive impact on Pakistan's travel and tourism industry by increasing the supply of tourism goods in the urban areas. As the number of people residing in urban areas increases, there is evidently a high likelihood of an increase in economic activity and production. Against this backdrop, the main aim of this paper is to examine

the relationship between urbanisation, local food crop production and the tourism output of Pakistan.

The above discussion indicates that due to the growth of the global tourism industry, the mobility of people across international borders has significantly increased. There are two reasons why understanding the conceptualisation of the relationship between urbanisation, local food crop production and tourism output needs to be explored in detail. First, tourism plays an important role in the economic development of Pakistan. It is extremely important for policy-makers to understand how changes in urbanisation and local food crop production will affect the tourism output of Pakistan. Policy-makers undoubtedly have to strategise for the sustainable development of the tourism industry and one of the key components of strategising is to determine the impact of the wider economic variables on the tourism output of Pakistan. Second, the theoretical orientations proposed in this study explicitly state that changes in the tourism output of a nation can be effectively explained by changes in urbanisation and local food crop production. Arshad *et al.* (2017) and Qureshi *et al.* (2017) have used economic theory to explain the research questions proposed in their studies. Drawing on their studies, this study also undertakes a similar approach and emphasises that the Cobb-Douglas production function can be easily used to determine the relationship between urbanisation, local food crop production and tourism output.

This study needs to be conducted for two reasons. First, to the best of our understanding, none of the existing studies have examined the relationship between urbanisation, local food crop production and tourism output of Pakistan. There are numerous qualitative studies conducted on these issues, but none of the existing studies have used robust empirical estimation techniques to explore the relationship between urbanisation, local food crop production and tourism output of Pakistan. This study seeks to expand the existing literature by exploring this relationship. Second, this study provides an essential theoretical platform for examining the relationship between urbanisation, local food crop production and tourism output of Pakistan. The use of the indifference curve argues that there will be a trade-off between the local food crop production and urbanisation, and this premise is examined and discussed in the research findings section.

This paper is divided into five sections. Section 2 outlines the theoretical framework and reviews the literature. Section 3 outlines the data and model specification. Section 4 presents the research findings and section 5 discusses the research findings and concludes this paper.

2. Theoretical orientations and literature review

Understanding the different forms of urbanisation is complex, as it involves understanding the direction and shift of people in an economy. Innovation and rapid technological progress have given rise to different types of industries that did not exist in the 1900s (Borrás 2019; Naidu 2016). As an exemplar, modern studies are examining the growth of semi-urban centres and the drivers of growth of these semi-urban centres. The main issue of contention in this paper is how we can establish a relationship between urbanisation, local food crop production and tourism output. Some of the theoretical economic models used in the existing literature to explain the relationship between urbanisation, economic growth, inflation and tourism output are the Harris and Todaro model and the Cobb Douglas production function (Cobb and Douglas 1928; Harris and Todaro 1970; Naidu 2017; Naidu *et al.* 2017). Following the study conducted by Bloom *et al.* (2010), this paper recognises that the ratio of urban population to the rural population is given as follows:

$$URP = \frac{PU}{PR} \tag{1}$$

In equation (1), URP is the ratio of urban population to the rural population. Drawing from the formula given in equation (1), urbanisation is the ratio of the population concentrated in the urban areas to the total population. Total population is the sum of the population in the urban and rural areas. The formula for urbanisation is provided in equation (2):

$$U = \frac{PU}{PR + PU} \tag{2}$$

In equation (2), U is the measure of urbanisation, and PU is the population in the urban areas. The measure of the total population is obtained by adding PR and PU. Following the studies conducted by Harris and Todaro (1970), Cobb and Douglas

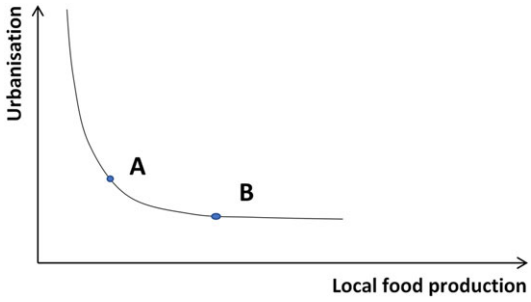

FIGURE 1. Indifference curve [Colour figure can be viewed at wileyonlinelibrary.com]
Source: developed by the authors, using information from Mankiw (2012).

(1928), Naidu *et al.* (2017), and Naidu (2017), this study utilises the Cobb Douglas function to examine the relationship between urbanisation, local food crop production and tourism output. The basic form of the Cobb-Douglas function is given as follows (Cracolici *et al.* 2006; Holzner, 2011):

$$y = x^{\alpha} z^{\beta} \quad \alpha + \beta = 1 \tag{3}$$

In equation (3), y is output, x and z represent two goods that are produced in the economy, and α and β represent the elasticity's of good x and z. The functional form of the variables used in this study is given in equation (4):

$$\text{TO} = f(FP,\ UB,\ other\ things\ constant) \tag{4}$$

In equation (4), FP represents local food crop production and UB represents urbanisation. Substituting equation (4) in equation (3) we get:

$$\text{TO} = FP^{\alpha} UB^{\beta} \tag{5}$$

The indifference curve for the Cobb Douglas function given in equation (3) is illustrated in Fig. 1.

Fig. 1 shows that there is a trade-off between local food crop production and urbanisation. Point A is superior to point B because it has the right mix of urbanisation and local food production.

Understanding the relationship between land and agriculture and the role these two socioeconomic commodities play in society is too sophisticated to be understood in the context of Pakistan. There are many studies that have argued that the two major causes of conflict in Pakistan are wealth and land (Ahmad 1977; Lyon 2004). These two causes of conflict are relatable to the main research question proposed in this paper. Agriculture has been one of the backbone of Pakistan's economy since British rule, and it has continued to be one of the important contributors to the economic growth of Pakistan (Yameen 2019). The green revolution of the 1960s led to a major change in the way agricultural production is managed and agriculture output is produced in Pakistan (Abbas *et al.* 2016; Ahmad *et al,* 2004). With the introduction of hybrid seeds, advanced technology, and capacity building of the farmers, a significant increase in the yields was noticed, but this growth in yield could not be sustained for a long period of time due to poor government policies and unequal ownership of land. Mughal (2018) argued that rural urbanisation is increasing in the Pakistani Punjab, with a number of farmers abandoning agriculture and adopting lucrative occupations that would provide them with stable cash flows.

Lahore is one of the largest cities in Pakistan and is home to historical monuments, trade, and commerce (Rana and Bhatti 2018). This city is growing at a tremendous rate, with recent statistics estimating that it has doubled in size, and it is predicted that it will continue to grow. Two of the factors that have led to this increase are massive growth in the infrastructure and squatter settlements (Rana and Bhatti 2018). Some of the factors that have caused poor urban development in Pakistan are poor urban development policies, poor building control systems in place, and lack of monitoring of urban growth (Rana and Bhatti 2018).

There are numerous studies conducted on urbanisation (Jedwab *et al.* 2015), agriculture (Malik and Ali 2015), energy consumption (Amin and Rahman 2019; Shahbaz *et al.* 2017), environmental degradation (Azam and Khan 2016; Faridi *et al.* 2018), and poverty (Baqir 2018; Khan *et al.* 2016). A close review of existing literature shows that there are hardly any studies conducted on urbanisation, local crop production and tourism output. Tosun (2000) and Eshetu (2014) emphasised that developing backward linkage with local growers is a participatory approach that can be adopted by the stakeholders of the tourism industry. This approach will not only benefit local farmers, but will have a multiplier effect on the whole economy. Telfer and Wall (2000) found that the tourism industry of Indonesia can enhance its backward linkage by using local crops produced in Indonesia. This study also found that two out of

three hotels in Indonesia have strong links with local farmers. Boyne and Hall (2003) highlighted that the government of the UK has strategic development plans that require local farmers to work with the business players in the tourism industry in order to meet the demands of tourists. Fleischer and Tchetchik (2005) emphasised that farm activities are of no importance to the tourists visiting Israel. The main contribution of local farmers to the travel and tourism industry is what they can supply to meet the needs and requirements of the local tourism industry.

Sharpley and Vass (2006) conducted a survey of farmers in north-east England. This study found that local farmers want the government to distinguish large-scale farmers from small-scale farmers. It is easier for small-scale farmers to work with the business players in the tourism industry because all their produce can be directly used as inputs into the tourism industry. The case of large farmers is very different. Large farmers produce more crops and they have to work not only with the tourism but with other local and international buyers. Mitchell's study of 12 developing countries (2012) found that enhancing backward value chain linkage with the local produce industry will increase the positive impact of the tourism industry on the national economy. According to Cernat and Gourdon (2012), tourism should complement existing economic activities. One of the key ways in which this can be facilitated is by involving local producers in the tourism industry. Malik and Wahid (2014) argued that the growth of squatter settlements in Pakistan has resulted in lack of space available for formal housing in the urban areas.

In most of the urbanisation literature, there is greater emphasis given to the movement of people from rural to urban areas (Peerzado *et al.* 2018; Rana *et al.* 2017). Recently, there has been a new form of urbanisation taking place, whereby people move from interior communities to semi-rural areas that provide economic opportunities and alternative forms of employment for rural households (Kedir *et al.* 2016; Rashid and Sahir 2015). The literature review above shows that while many studies have examined issues related to rural urbanisation, none of the existing studies have examined the relationship between urbanisation, local food crop production and tourism output. This study contributes to the existing literature by examining this relationship in the context of Pakistan. Based on the above reviews and discussions the following hypothesis is proposed:

H1: There is a relationship between urbanisation, local food crop production and tourism output.

3. Data and model specification

The data on urbanisation and the local food crop production was collected from the World Bank database. Due to lack of availability of tourism data in this database, data on tourism output was collected from the following website: http://knoema.com/WTTC2015/world-travel-and-tourism-council-data-2015. This database has data extracted from the World Travel and Tourism Council database. The three main variables used in this study are as follows:

- Urbanisation was measured by the urban population growth rate, annual percentage.
- Local food crop production was measured by the food production index, which measures the food crops that are edible and contain nutrients.
- Tourism output was measured by the contribution of travel and tourism sector to the GDP (US$2011 billion).

This study is based on 59 observations, as the data was collected from 1960 to 2018. Following the studies conducted by Yameen (2019), Abbas *et al.* (2016), and Ahmad *et al.* (2004), this study argues that there can be a relationship between urbanisation, tourism output, and local food crop production. The econometric model captured in equation (6) is subject to econometric testing as it captures the relationship between urbanisation, tourism output and local food crop production. For estimation purposes, the econometric model is specified as follows:

$$InTO_t = \beta_0 + \beta_1 InUB_t + \beta_2 InFP_t + \beta_3 DUM_t + \varepsilon_t \quad (6)$$

In equation (6), $InTO_t$ is the natural logarithm of tourism output, $InUB_t$ is the natural logarithm of urbanisation, $InFP_t$ is the natural logarithm of local food production, and DUM_t is the dummy variable accounting for the structural breaks in the

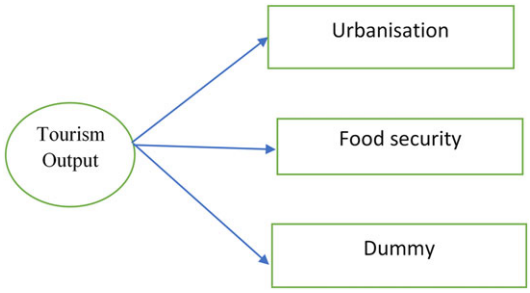

FIGURE 2. Effect of urbanisation and local food crop production on tourism output [Colour figure can be viewed at wileyonlinelibrary.com]
Source: created by the authors.

series. In equation (6), tourism output is treated as a dependent variable and independent variables are urbanisation, local food crop production, and dummy variable. Fig. 2 shows the research mechanism on the effect of urbanisation and local food crop production on tourism output.

The Autoregressive Distributed Lag (ARDL) model is used to examine the changes in the economic variables or economic scenarios. In an economy changes in the economic variables are explained from different perspectives. These changes are usually spread over a long period of time (Hassler and Wolters 2006). Essentially, the lag effects are important variables in the ARDL model. As captured in equations (7), (8), and (9), changes in the log of tourism output are determined by the lags of the independent variables, changes in the independent variables based on q period lags (Chetty 2018). In order to examine the long-run relationship between the variables used in this study, the ARDL bounds test approach for cointegration is used. The econometric model for the ARDL bounds test approach for long-run cointegration is specified as follows:

$$\begin{aligned}\Delta InTO_t = {} & \beta_{10} + \beta_{11} InUB_{t-1} + \beta_{12} InFP_{t-1} \\ & + \beta_{14} DUM_{t-1} + \sum_{i=1}^{q} \theta_{11i} \Delta InTO_{t-i} \\ & + \sum_{i=1}^{q} \theta_{12i} \Delta InUB_{t-i} + \sum_{i=1}^{q} \theta_{13i} \Delta InFP_{t-i} \\ & + \sum_{i=1}^{q} \theta_{14i} \Delta DUM_{t-i} + \varepsilon_{t1} \end{aligned} \quad (7)$$

$$\begin{aligned}\Delta InUB_t = {} & \beta_{20} + \beta_{21} In\ TO_{t-1} + \beta_{22} InUB_{t-1} \\ & + \beta_{23} InFP_{t-1} + \beta_{24} DUM_{t-1} \\ & + \sum_{i=1}^{q} \theta_{21i} \Delta InTO_{t-i} + \sum_{i=1}^{q} \theta_{22i} \Delta InUB_{t-i} \\ & + \sum_{i=1}^{q} \theta_{23i} \Delta InFP_{t-i} + \sum_{i=1}^{q} \theta_{24i} \Delta DUM_{t-i} \\ & + \varepsilon_{t2} \end{aligned} \quad (8)$$

$$\begin{aligned}\Delta InFP_t = {} & \beta_{30} + \beta_{31} InTO_{t-1} + \beta_{32} InUB_{t-1} \\ & + \beta_{33} InFP_{t-1} + \beta_{34} DUM_{t-1} \\ & + \sum_{i=1}^{q} \theta_{31i} \Delta InTO_{t-i} + \sum_{i=1}^{q} \theta_{32i} \Delta InUB_{t-i} \\ & + \sum_{i=1}^{q} \theta_{33i} \Delta InFP_{t-i} + \sum_{i=1}^{q} \theta_{34i} \Delta DUM_{t-i} \\ & + \varepsilon_{t3} \end{aligned} \quad (9)$$

In equations (7), (8), and (9), Δ is the first difference of the respective variables.

TABLE 1. Descriptive statistics for local food crop production, tourism output, and urbanisation

	Local food crop production	*Tourism output*	*Urbanisation*
Mean	93.73724	1.01E+10	2.998338
Median	88.55000	8.41E+09	2.733897
Maximum	131.0500	1.87E+10	3.944763
Minimum	54.52000	3.55E+09	2.574262
Std. Dev.	23.72557	4.56E+09	0.429440
Skewness	0.071387	0.392388	0.812778
Kurtosis	1.825876	1.802634	2.261752
Jarque-Bera	1.690399	2.476553	3.851490
Probability	0.429472	0.289883	0.145767
Sum	2718.380	2.92E+11	86.95181
Sum Sq. Dev.	15761.27	5.81E+20	5.163712
Observations	29	29	29

Source: created by using Eviews8 Output.

4. Research findings

The descriptive statistics for the local food crop production, tourism output and urbanisation are presented in Table 1. The mean values for the local food crop production is 93.74, tourism output is US$ 10,100,000,000 and urbanisation is 2.998 per cent.

Table 2 shows that there is a positive correlation between local food crop production and tourism output as the correlation values are very

TABLE 2. Correlation for local food crop production, tourism output, and urbanisation

	Local food crop production	*Tourism output*	*urbanisation*
Local food crop production	1	0.984	−0.889
Tourism output	0.984	1	−0.833
Urbanisation	−0.889	-0.833	1

Source: created by using Eviews8 Output.

close to 1. This finding is intuitively correct: as local food crop production increases, the contribution of the tourism and travel sector to the economy is likely to increase. In contrast, there is a negative correlation between urbanisation and local food crop production. As people shift from rural to urban areas, local food crop production is likely to decrease.

The DF-GLS and PP test results presented in Table 3 shows that $InFP_t$, $InTO_t$ and $InUB_t$ are I(1) variables. The null hypothesis that $InFP_t$, $InTO_t$ and $InUB_t$ has a unit root is rejected after first differencing.

Table 4 shows that the possible breakpoint in the series is present in the year 2003. In 2003, the economy of Pakistan faced a positive structural break. This structural break will be factored in as a dummy variable while conducting the analysis for the short-run dynamics and long-run effects.

The results of the VAR lag order selection criteria are presented in Table 5. As per the results presented in Table 5, two lags will be used for estimating the ARDL bounds test for long-run cointegration.

Fig. 3 shows the multiple graphs for the impulse response functions for one standard deviation shock on variable 1 and the effect of this on variable 2. The effect of one standard deviation shock on tourism output and its impact on local food crop production and urbanisation tends to die off after two to three lags. Similarly, the impact of one standard deviation shock of urbanisation and its impact on tourism output and local food crop production tends to die off after four to six lags. The effect of one standard deviation shock on local food crop production and its impact on urbanisation and tourism output tends to die off after four to five lags.

TABLE 3. Unit root test for $InTO_t$, $InUB_t$ and $InFP_t$

Test	*Integration order*	$InTO_t$	$InUB_t$	$InFP_t$
DF-GLS	I(0)	2.068056	0.085066	0.530961
	I(1)	-5.768351^{***}	-1.992955^{**}	-3.288196^{***}
PP	I(0)	4.998606	−1.120211	2.708490
	I(1)	-5.799820^{***}	-4.963382^{***}	-7.321687^{***}

Note: ** $p < 0.05$; *** $p < 0.001$.
Source: created by using Eviews8 Output.

TABLE 4. Bai-Perron tests of L+1 vs. L sequentially determined breaks

Date: 01/11/19 Time: 11:08
Sample: 1960 2018
Included observations: 29
Breakpoint variables: URBAN FPI C
Break test options: Trimming 0.15, Max. breaks 5, Sig. level 0.05

Sequential F-statistic determined breaks: 1

Break test	*F-statistic*	*Scaled F-statistic*	*Critical value***
0 vs. 1*	16.04331	48.12993	13.98
1 vs. 2	3.575263	10.72579	15.72

*Significant at the 0.05 level.
**Bai-Perron (*Econometric Journal*, 2003) critical values.

Break dates:

	Sequential	*Repartition*
1	2003	2003

Source: created by using Eviews8 Output.

Fig. 4 shows that local food crop production explains greater variation in tourism output as compared to urbanisation. Similarly, tourism output explains greater variation in urbanisation as compared to local food crop production. Also, tourism output explains greater variation in local food crop production as compared to urbanisation.

Table 6 shows the results of the ARDL bounds test. The F-Wald test statistics are greater than the upper bound critical value extracted from Narayan (2005), when $InTO_t$ is used as the dependent variable. Therefore, the results show that there is long run cointegration between $InUB_t$, $InTO_t$, and $InFP_t$ when $InTO_t$ was used as the dependent variable.

The results of the long-run parameters estimated in this study are captured in equation (10). The findings show that a 1 per cent increase in local food crop production will increase tourism output by 1.77 per cent, at the 1 per cent level of significance, holding all other variables

TABLE 5. VAR Lag order selection criteria for $InTO_t$, $InUB_t$ and $InFP_t$

VAR Lag order selection criteria
Endogenous variables: TOUCONT URBAN FPI
Exogenous variables: C
Date: 01/11/19 Time: 11:18
Sample: 1960 2018
Included observations: 27

Lag	*LogL*	*LR*	*FPE*	*AIC*	*SC*	*HQ*
0	−701.8684	NA	9.51e+18	52.21247	52.35645	52.25528
1	−585.1389	198.8724	3.28e+15	44.23251	44.80844*	44.40377
2	−572.9518	18.05500*	2.67e+15*	43.99643*	45.00430	44.29612*

*indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion
Source: created by using Eviews8 Output.

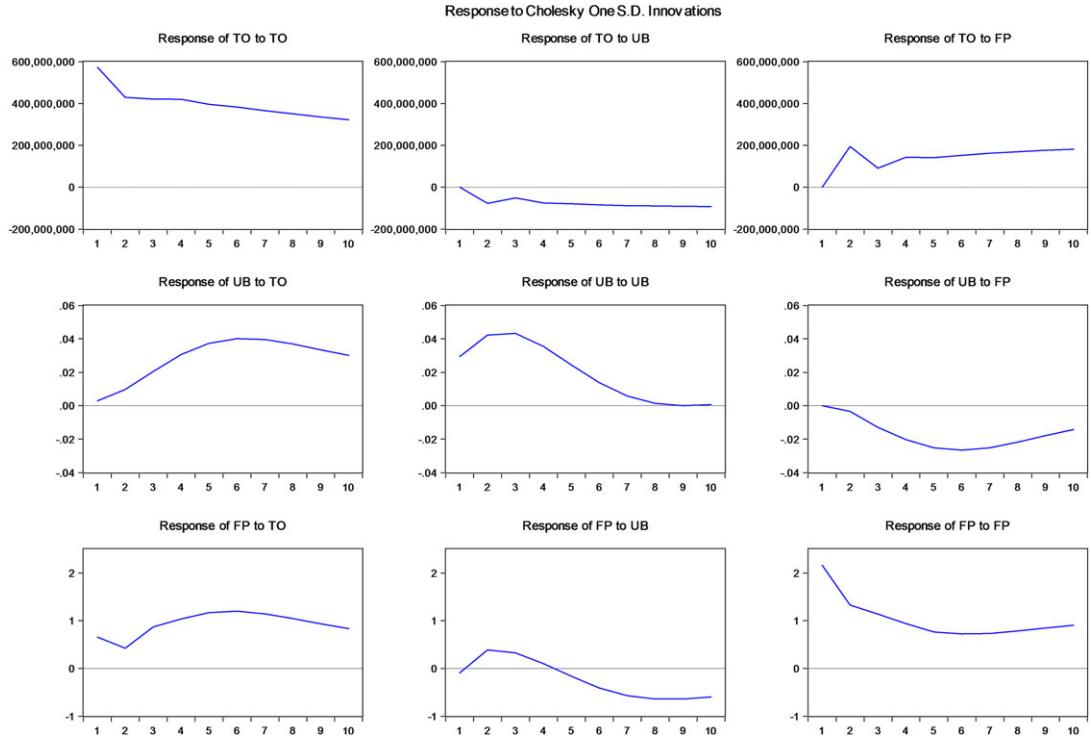

FIGURE 3. Impulse response function for $InTO_t$, $InUB_t$ and $InFP_t$ [Colour figure can be viewed at wileyonlinelibrary.com]
Source: created by the authors using EViews software.

constant.

$$\begin{array}{lcccc} \widehat{InTO}_t = & 14.98057_0 - 0.027633 InUB_t + 1.769655_2 InFP_t - 0.025139_3 DUM_t \\ t = & (14.42) & (-0.09) & (11.14) & (-0.305) \\ p = & (0.00) & (0.93) & (0.0000) & (0.76) \end{array} \quad (10)$$

The diagnostic test results presented in Table 7 shows that our model is homoscedastic and normally distributed.

The results of the short-run parameters estimated in this study are captured in equation (11). The error correction term is positive and significant; therefore, the disequilibrium in the short-run model

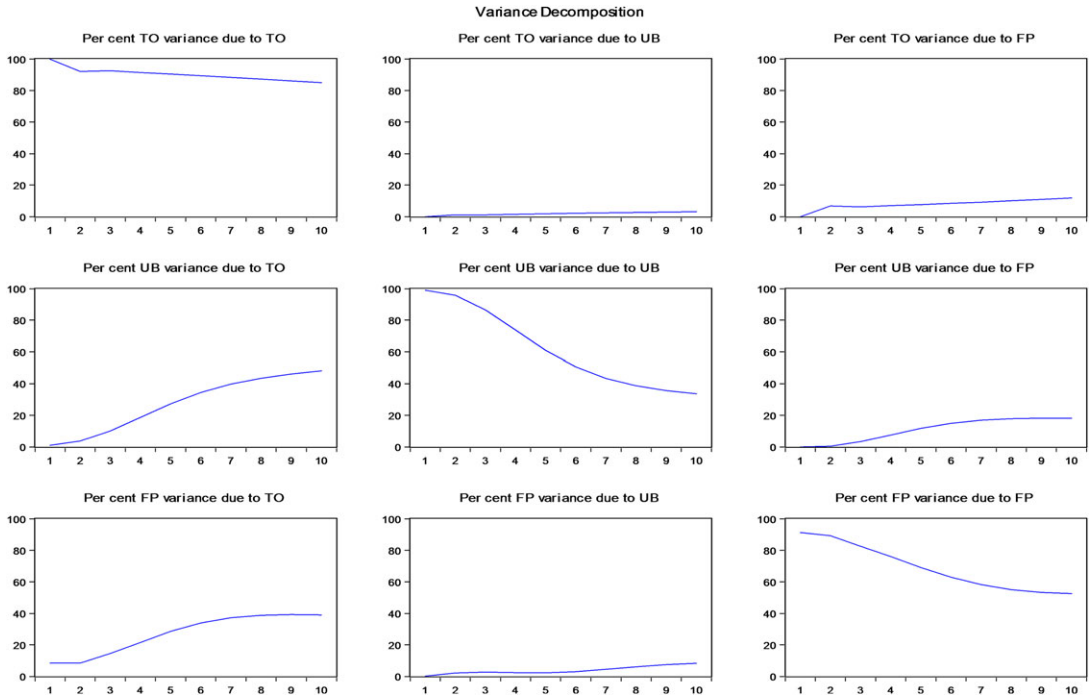

FIGURE 4. Variance decomposition for $InTO_t$, $InUB_t$ and $InFP_t$ [Colour figure can be viewed at wileyonlinelibrary.com]
Source: created by the authors using EViews software.

can be corrected.

$$\begin{array}{lccccc} \widehat{InTO_t} = & 0.021391_0 & -0.94_1\Delta InUB_t & +0.7027_2\Delta FP_t & +0.0308_3 DUM_t & +0.535_4 ECT \\ t = & (0.99) & (-1.28) & (1.498) & (0.51) & (3.228) \\ p = & (0.33) & (0.21) & (0.15) & (0.62) & (0.0037) \end{array} \quad (11)$$

The diagnostic test results presented in Table 8 shows that our model is homoscedastic and normally distributed.

Table 9 shows that there is unidirectional causality running from local food crop production and urbanisation.

5. Discussion

Urban cities are growing fast, but in the case of Pakistan this has not restricted tourists from visiting the country and enjoying the local culture, food, and traditional sites. Congruent with the arguments of the International Growth Centre (2019) and Khan (2018), as the size of the city increases, a number of development problems, such as health and socioeconomic problems, may increase, and this can have a negative impact on the tourist numbers visiting Pakistan every year. It has been clearly emphasised in the previous section that there is a positive correlation between local food crop production and the tourism output of Pakistan. As Lyon (2004) and Ahmad (1977) argue, land and agriculture play an essential socioeconomic role in the economic development of Pakistan. Increasing local food crop production will increase the contribution by the travel and tourism industry to Pakistan's economy. There are a number of reasons why tourists travel and one of the most common reasons is that they want to taste authentic local dishes and enjoy locally grown fruit and vegetables. This study confirmed that there is negative correlation between urbanisation and local food crop production. As Mughal (2008) argues, many rural dwellers living in the rural areas are abandoning agriculture and adopting lucrative occupations that would provide them with stable cash flows. Drawing on the studies conducted by Rana *et al.* (2017) and Peerzado *et al.* (2018), this study confirms that people are abandoning agriculture and moving to semi-rural areas to look for better employment opportunities.

TABLE 6. ARDL bounds test results

	Dependent variables		
Test	$InTO_t$	$InFP_t$	$InUB_t$
F Wald test	8.43	3.433	4.54
P Wald test	0.0006	0.035	0.01
	Critical upper bound and lower bound values from Narayan (2005)		
N = 60 5%	I(0): 4.298 I(1): 5.445	I(0): 4.298 I(1): 5.445	I(0): 4.298 I(1): 5.445
N = 60 10%	I(0): 3.645 I(1): 4.678	I(0): 3.645 I(1): 4.678	I(0): 3.645 I(1): 4.678

Source: created by using Eviews8 Output.

The long-run parameters indicate that a 1 per cent increase in local food crop production will increase tourism output by 1.77 per cent, at the 1 per cent level of significance, holding all other variables constant. This finding is intuitively correct: as local food crop production increases, tourists are more likely to spend more dollars in the tourism industry, as this will maximise the utility of their visit. As Tosun (2000) and Eshetu (2014) argue, to boost local food crop production, the growers need to develop a strong relationship with the stakeholders of the tourism industry. Growers need to ensure that the locally grown food crops are made available to all the important restaurants, sight-seeing areas, and tourist hubs in Pakistan.

Moreover, the Granger causality test confirmed that there is unidirectional causality running from local food crop production to urbanisation. As Rana and Bhatti (2018) argue, local food crop production is a driver of urbanisation because people are moving from rural areas to urban areas in search of new opportunities and employment. Unlike the studies conducted by Naidu *et al.* (2017) and Naidu (2017), this study could not establish a significant impact of urbanisation on tourism output in the case of Pakistan. One of the main reasons why this relationship could not be established is because tourists are still visiting the urban cities in Pakistan, although the size of the city is growing fast. Most tourists come to the cities not to see modern buildings, but to experience the livestyle of people, culture, and traditions (Saiyid 2018).

Based on the summary of the research findings presented above, it can be concluded that in the short run, policy-makers need to implement sustainable urban and rural development policies to boost the

TABLE 7. Diagnostic test results for the long-run parameters

Heteroskedasticity test: Breusch-Pagan-Godfrey	F-Statistics: 1.39 Prob. F(3,25): 0.2679
Jarque-Bera	Jarque-Bera: 0.232 Prob.: 0.89

Source: created by using Eviews8 Output.

TABLE 8. Diagnostic test results for the short-run parameters

Heteroskedasticity test: Breusch-Pagan-Godfrey	F-Statistics: 1.09 Prob. F(4,23): 0.3864
Jarque-Bera	Jarque-Bera: 2.355 Prob.: 0.31

Source: created by using Eviews8 Output.

TABLE 9. Pairwise Granger causality tests

Null hypothesis:	*Obs*	*F-Statistic*	*Prob.*
UB does not Granger cause TO	28	0.54430	0.5875
TO does not Granger cause UB		0.27602	0.7613
DUM does not Granger cause TO	29	10.5936	0.0005
TO does not Granger cause DUM		0.78211	0.4688
FPI does not Granger cause TO	27	1.68456	0.2086
TO does not Granger cause FPI		0.30382	0.7410
DUM does not Granger cause UB	56	0.00159	0.9984
UB does not Granger cause DUM		0.81811	0.4470
FPI does not Granger cause UB	54	6.39478	0.0034
UB does not Granger cause FPI		0.01663	0.9835
FPI does not Granger cause DUM	54	0.43275	0.6512
DUM does not Granger cause FPI		1.41472	0.2527

Source: created by using Eviews8 Output.

local food crop production. Traditionally, it was believed that rural areas need to be developed so that people living in the rural areas can contribute to, and sustain the demand for, high quality agricultural commodities. However, with the advance of modern technology, local food crop production can be sustained in the urban areas. Pakistan is still in the early stages of improving the application of urban technology for food crop production in the urban areas. International collaboration with Japan and South Korea will help the policy-makers to effectively harness the opportunities that modern technology provides to grow food in urban areas. This is a medium- and long-term plan, but the immediate plan is to encourage farmers to continue with agriculture farming and incentivise them to innovate farming practices and generate employment on the farms. Mughal (2018) argues that farmers are abandoning agriculture and seeking other forms of employment that will provide them with stable cash flows. It is important to encourage farmers to continue with agriculture farming and provide the necessary support to farmers for them to be able to increase the productivity of agriculture farms. This study did not find a significant impact of urbanisation on tourism output because tourists still continue to visit the urban cities to experience the livestyle of people, culture, and traditions. However, policy-makers need to implement sustainable short-, medium-, and long-term urban development plans in order to curb specific problems that may prevent tourists from visiting urban areas in Pakistan. Some of these specific problems that need to be urgently addressed in the urban areas are overcrowding, health problems, poverty, overgrowth of the slum areas, crime, etc. Specific policies to address these problems will ensure the sustainable development of the tourism industry, with rural farmers and urban businesses playing an equally important role in the tourism industry.

To sum up, the findings from this study have contributed to the existing literature on urbanisation, local food crop production and tourism output. Countries that have an abundance of locally produced food, friendly people, and attractive sites should be able to attract tourists from all over the world. Sadly, due to the lack of financial reward in agricultural farming, people are abandoning farming and adopting more lucrative forms of employment in Pakistan. One of the limitations of this study is that it is based on only one geographical setting. Future studies should be conducted in a number of developing countries so that the external validity of this study can be enhanced, and research findings can be compared across geographical regions.

Appendix 1.

TABLE A1. Estimation of long-run parameters

Dependent variable: LOG(TOUCONT)
Method: least squares
Date: 01/11/19 Time: 17:35
Sample (adjusted): 1988 2016

Included observations: 29 after adjustments

Variable	*Coefficient*	*Std. error*	*t-Statistic*	*Prob.*
LOG(URBAN)	−0.027633	0.307991	−0.089720	0.9292
LOG(FPI)	1.769655	0.158879	11.13839	0.0000
DUM	−0.025139	0.082221	−0.305744	0.7623
C	14.98057	1.038988	14.41843	0.0000
R-squared	0.977609	Mean dependent var		22.92732
Adjusted R-squared	0.974922	S.D. dependent var		0.474181
S.E. of regression	0.075091	Akaike info criterion		−2.212783
Sum squared resid	0.140967	Schwarz criterion		−2.024190
Log likelihood	36.08535	Hannan-Quinn criter.		−2.153718
F-statistic	363.8409	Durbin-Watson stat		1.075046
Prob(F-statistic)	0.000000			

TABLE A2. Estimation of short-run parameters

Dependent variable: D(LOG(TOUCONT))
Method: least squares
Date: 01/11/19 Time: 17:43
Sample (adjusted): 1989 2016

Included observations: 28 after adjustments

Variable	*Coefficient*	*Std. error*	*t-Statistic*	*Prob.*
D(LOG(URBAN))	−0.942295	0.734764	−1.282446	0.2125
D(LOG(FPI))	0.702733	0.468972	1.498454	0.1476
DUM	0.030772	0.060789	0.506208	0.6175
ECT	0.534778	0.165661	3.228151	0.0037
C	0.021391	0.021690	0.986198	0.3343
R-squared	0.344578	Mean dependent var		0.059258
Adjusted R-squared	0.230591	S.D. dependent var		0.067751
S.E. of regression	0.059428	Akaike info criterion		−2.647660
Sum squared resid	0.081230	Schwarz criterion		−2.409767
Log likelihood	42.06725	Hannan-Quinn criter.		−2.574934
F-statistic	3.022972	Durbin-Watson stat		2.182821
Prob(F-statistic)	0.038522			

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