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Estimating tourism losses due to COVID-19 Pandemic: The case of Puerto Princesa underground river, Philippines

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ABSTRACT

This study estimated the economic losses of Puerto Princesa Underground River (PPUR) caused by the COVID-19 pandemic. The PPUR in Puerto Princesa City, Palawan, Philippines is part of the Puerto Princesa Subterranean River National Park (PPSRNP) and is recognized as a UNESCO World Heritage Site. The lost tourist arrivals caused declining PPUR revenues, affected the local economy, and posed a potential threat to PPSRNP's environment. The Seasonal Autoregressive Integrated Moving Average (SARIMA) was used to estimate the revenue and tourist arrivals while the Simple Exponential Smoothing (SES) was used to estimate PPUR expenses. The results revealed that the PPUR lost Php 172,997,905.00 which was attributed to the foregone 281,441 international tourists and 335,687 domestic tourists from 2020-2021. The PPUR management could expect Php 2,230.56 as revenue per potential tourists, an increase in revenue of roughly Php 96.7 million, an increase in international tourist arrivals, and a decrease in domestic tourist arrivals from 2022-2024 had there been no pandemic. Thus, PPUR management should forge active collaboration with different stakeholders for sustainable operation in times of economic disaster.

Keywords: COVID-19, CBSTs, losses, PPUR, tourism-related businesses

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INTRODUCTION

The coronavirus disease (COVID-19) brought catastrophic effects on several sectors of the economy worldwide, particularly the tourism industry, which has been severely impacted due to its reliance on physical interactions with tourists (Orîndaru et al., 2021). The Philippine tourism industry experienced tremendous impacts of COVID-19. Before the onset of the pandemic, the tourism industry employed 5.71 million people and generated 12.7% of the country's GDP.

Community lockdowns are institutionalized as the Philippine national and local governments battled the pandemic's spread. In 2020, the Enhanced Community Quarantine (ECQ) began on March 16. This has been known as one of the world's longest and strictest lockdowns and quarantine measures (Maliao et al., 2023). Such policy impaired the value chain for both the demand and supply sides leading to economic recession, high employee turnovers, and lost income. Orîndaru et al., (2021) posit that the public health crisis has transformed into an economic crisis. As a result, Maliao (2023) reveals that the transport and storage sector lost 30.9% in output while a decline of 45.5% in output was recorded from the accommodation and food service sectors back in 2020. Nagaj and Zuromskaite (2021) highlights that small and medium enterprises are harmed, forcing them to lay off their employees. Worse consequences were also seen in many tourism-related industries globally.

The Organization for Economic Co-operation and Development (2020) reports that tour companies and transportation worldwide, particularly aircraft and cruise experienced a significant drop in passengers, with some even ceasing operations. International passengers were reduced by 44 to 80 percent in aviation, while cruise lines were given no-sail orders. Tour guidesshowed a significant drop in their activities. The tourism shopping (e.g. pasalubong centers) and private tourism agencies were adversely affected (García-Milon et al., 2021). This proves that the crisis is far from over in the tourism sector alone; different related businesses also need extra attention in providing solutions not just for tourism promotion and employment recovery but also for reducing the costs of implementing protective measures in place (Rodríguez-Antón and Alonso-Almeida 2020).

Palawan's economy is heavily reliant on tourism activities with Php83 billion tourism receipts in 2018 (Fabro, 2020). However, the unprecedented severity of the impacts of the global COVID-19 pandemic on the tourism industry is truly besetting. The Puerto Princesa Underground River (PPUR) park heavily depends on the revenue gained from tourist visits to sustain its operations. The severe economic turmoil caused by the COVID – 19 threatened the park's operations which require at least Php50 million to operate a year with two-hundred twenty-four (224) member forces as of the writing. Some of the community members tend to do "kaingin" or slash-and-burn farming if they cannot perform their usual livelihood regularly (De Miranda et al., 2020). Thus, the need to revamp their positive profit, safeguard the mountain-to-sea ecosystem, and promote PPUR tourism sustainably is urgent. With the frequency of COVID-19 infections fluctuating, creating a strategic tourism marketing plan, and enhancing COVID-19 safety standards are highly necessary (Orîndaru et al., 2021).

The main objective of this study is to estimate the PPUR international and domestic tourist arrival losses in 2020-2021 and to generate forecasted values in the next five years (2020-2024). The study also considered the estimation of revenue losses and forecasting of expenses in PPUR and its impact on Community Based Sustainable Tourism (CBSTs) and other tourism-related businesses within and outside the host communities.

Most research studies about estimating tourist arrivals used the SA-

RIMA method which factors in the seasonality of the data. The tourist arrival depends on seasonal factors thereby affecting their influx's intensity. The universally recognized global tourism phenomenon of seasonal factors refers to the temporary movement of tourists based on climate conditions and public and school holidays Corluka (2019). Thus, seasonality is the temporal imbalance in the tourism flow and the concentration of tourists arriving at a certain period (Karamustafa and Ulama, 2010).

Current literature has only focused on estimating international tourists and total tourist arrivals. For instance, Baldigara and Mamula (2015) estimated the arrival of Germans in Croatia. It was imperative to collect such specific data to attract more German tourists and determine what nationalities need to be considered for stronger tourism promotion and pricing strategies. They found that their proposed SARIMA model (0,0,0) x (1,1,3) model was fitting to generate the needed results. Meanwhile, the SARIMA model (1,1,1,)x (1,0,1)12 was found to be best fitting with the lowest RMSE in the study of Centeno and Marquez (2020) in estimating the lost tourism revenue during the early period of COVID-19 in the Philippines. They further found out that an estimated Php 170.5 billion was expected to be lost if the health crisis lasted more than a quarter as of their writing.

Only a few studies have discussed domestic tourist arrivals and provided a separate analysis for international and domestic tourist arrival estimation. There must be paramount importance in the analysis of the crucial role of domestic tourism in tourism promotion during an economic crisis (Wu et al., 2022). Forecasting domestic tourist arrivals provides an opportunity to examine how they have lesser mobility restrictions and tend to choose destinations near their "home" (Falk et al., 2024). In effect, Arbulú et al., (2021) highlighted how domestic travel can recover quicke r than inbound travel. In this study, Spanish domestic tourists exhibit a substitution effect where they exchange their international travels for local destinations to minimize the health risks. This signifies them being less susceptible to external factors such as exchange rate fluctuation and international political events than international tourists in the presence of the current global pandemic. Bayih and Singh (2020) maintained that domestic tourism has a big role in addressing seasonality within regions. Although government and destination managers often prefer a high influx of international tourists, the importance of domestic tourism cannot be undermined by its ability to relieve local tourism.

Additionally, there is still no available study published online on different databases about forecasting tourist arrivals and revenue of PPUR, even before the pandemic. This study offers a great chance to contribute to the local government in managing the expected increase in domestic and foreign tourists visiting the PPUR, with or without an economic recession.

This study was conducted to estimate the revenue and tourist arrival losses of PPUR due to the COVID-19 pandemic using different SARIMA and Simple forecasting methods. A five-year ahead forecast of the PPUR revenue, its domestic and international tourist arrivals, and PPUR expenses starting from 2020-2024 was generated. An estimation of the PPUR forgone per capita revenue was also performed. Collectively, theforecasted losses were contextualized with Puerto Princesa's Gross City Domestic Product (GCDP) in 2021. Meanwhile, the negative spillover effect of the PPUR low tourist influx on the CBSTs and the tourism-related businesses was analyzed. The results can provide the factual basis for the post-COVID-19 recovery of PPUR, CBSTs, and the tourism-related businesses considered in the local tourism industry through the forwarded recommendations from this study.

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METHODOLOGY

Study area

The study site is the Puerto Princesa Subterranean River National Park (PPSRNP), located in Puerto Princesa City, Palawan, Philippines (Figure 1). The PPSRNP encompasses four rural Barangays namely, Tagabinet, Cabayugan, Marufinas, and New Panggangan. Sitio Sabang, Cabayugan, is the port's location to the Subterranean River (Jalani, 2012). Inside the PPSRNP is the PPUR which is recognized as one of the Natural Seven Wonders of the World. It serves as one of the greatest contributors to tourism revenue in the province of Palawan.

The subterranean river system and the feel of the Saint Paul Mountain Range's jagged peaks and edges of spectacular limestone karst that frame the 8.2-kilometer PPUR are breathtakingly and environmentally significant. The PPUR is one of the largest caves and the most visited in the Philippines. It offers an Underground River tour that draws millions of domestic and international tourists. The river's unique feature is that it flows directly into the sea, with the lowest half of the river being brackish and vulnerable to tidal forces. The underground river is home to endangered and endemic flora and animals. It is managedjointly by the local administration of PPC and the Protected Area Management Board (UNEP-WCMC, 2017; IUCN, 2020).

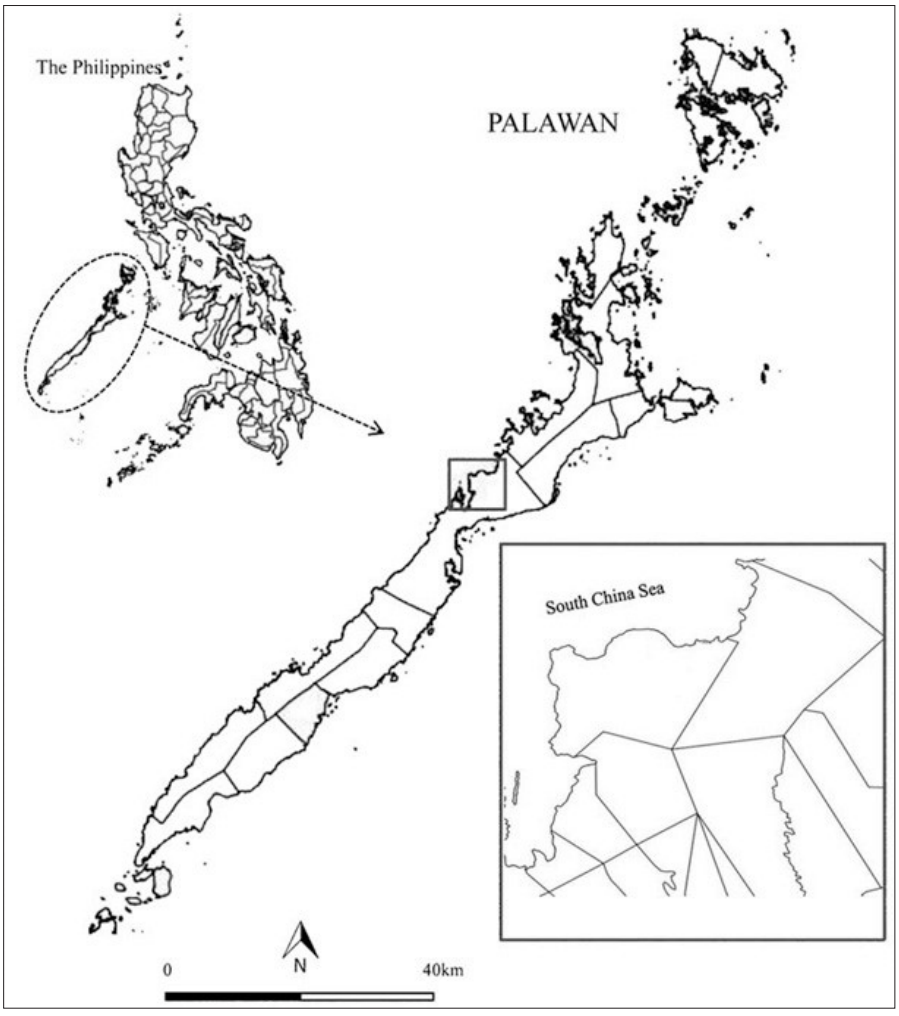

Figure 1. Map of Puerto Princesa Subterranean River National Park (PPSRNP) and Puerto Princesa Underground River (PPUR); Source: Pecundo et al. (2016). Note: The sea adjacent to Palawan has been named as West Philippine Sea as per Presidential Administrative Order No. 29 issued on September 5, 2012.

Data collection method

Primary and secondary data were utilized in this study to estimate the total revenue losses and the per capita expenses of international and domestic tourists. The primary data sources were from the key informant interviews with the PPUR Park Superintendent and a combination of email and phone interviews among 18 purposely- selected Department of Tourism (DOT)- -accredited Tour Operators in February 2022. Nine key informants from tourism-related business sectors and CBSTs were also interviewed. The key informants belong to each of the considered businesses (accommodation, food and beverage, transportation, entertainment (shopping or "pasalubong" centers), and travel agencies) and CBSTs. Their collective experiences contextualized the spillover effects of the low tourist influx of PPUR because of the COVID-19 pandemic in their respective business operations.

Meanwhile, the secondary data used were the historical monthlyPuerto Princesa Underground River (PPUR) revenue from January 1995 to December 2020 and PPUR domestic and international tourist arrivals from January 2000 to December 2021. In forecasting, the sample points used were only until 2019 to avoid a structural break from 2020 to 2021 because of the several non-operating months due to community lockdowns and to create a clear comparison of the pre-pandemic and pandemic operational performance of PPUR. Similarly, the PPUR yearly actual expenses from 2014 to 2021 were estimated from 2014 to 2019. Forecasting of expenses in 2020-2024 was done assuming that there is no pandemic.

Statistical analysis

This research employed both qualitative and quantitative research approaches. The quantitative analysis requires a robust SARIMA model for the following: (a) forecasting five-year-ahead international and domestic tourist arrivals from 2020-2024; (b) forecasting five-year-aheadPPUR revenue; (c) forecasting lost international tourist arrivals for 2020-2021;(d) forecasting lost domestic tourist arrivalsfor 2020-2021; and (e) forecasting foregone PPUR revenue in 2020-2021. On the other hand, the Simple Exponential Smoothing (SES) method is used to estimate potential expenses from 2020 to 2024 since sample points were limited.

Specifically, the Seasonal Autoregressive Integrated Moving Average (SARIMA) forecasting proceeded by rationalizing the PPUR revenue and its international and domestic tourist arrivals using seasonal differencing. The model identification was derived from the results of the Autocorrelated Function (ACF) and Partial Autocorrelated Function (PACF). Such results underwent overfitting and overfitting to consider other viable models. These models were subject to diagnostic tests (Maximum Log Likelihood, Akaike Information Criterion, Bayesian Information Criterion, White Noise, and Skewness and Kurtosis) and forecast accuracy measures (Root Squared Mean Error, Mean Absolute Error, Mean Absolute Percentage Error, and Theil's U). The determined best-fitting model is then used for the in-sample and out-sample forecasting. In forecasting, the 95 percent confidence interval is used.

On the other hand, the PPUR actual expenses were forecasted using Simple Exponential Smoothing (SES). The best-fitting smoothing constant equal to 1 was determined using a trial-and-error process. The forgone PPUR per capita revenue was concluded by deriving the mean tour rates per pax from the 18-DOT accredited tour operators. The above information was supplemented by a qualitative microeconomic analysis of the 2020-2021 PPUR tourist arrival lossesthat affected the tourism-related businesses and CBSTs. Specifically, the business revenue loss, labor quantity loss, and other concrete manifestations of the pandemic were analyzed.

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RESULTS

Model identification

Running a stationarity test revealed that at the level form, the monthly PPUR revenue, international and domestic tourist arrivals were non-stationary. The data were subjected to seasonal differencing to achieve stationarity having p-values less than 0.05. The rule of parsimony was employed in the patterns of the PACF and ACF to determine the smallest possible lags for the model identifications for the PPUR monthly revenue and tourist arrivals. After a thorough graphical analysis, the original model for PPUR monthly revenue was SARIMA (1,0,1)x(0,1,1)12. Such a model was evaluated through underfitting and overfitting processes to generate the counterfactual models: SARIMA(0,0,1x (0,1,1)12 and SARIMA (2,0,2)x(0,1,1)12. Using these, the best-fitted model was determined based on its respective parameters from the different criteria for model selection.

Similarly, the primary model for PPUR monthly international tourist arrival was SARIMA (1,0,1)x(0,1,1)12 alongside SARIMA (0,0,1)x(0,1,1)12 as the underfit model and SARIMA (2,0,2) x(0,1,1)12 as the overfit model. The identification of the PPUR monthly domestic tourist arrivals followed a similar process to the former two variables. The SARIMA models accounted for were SARIMA (2,0,2)x(0,1,1) 12 as the primary model, SARIMA (1,0,1) x(0,1,1)12 as an underfit model, and SARIMA (3,0,3) x(0,1,1)12 as the overfit model. Detailed results can be shared by the authors upon request.

Model diagnostic

The Maximum log-likelihood, AIC, BIC, and the residual patterns of the different models for each model previously determined were checked. After which, the qualified models from the different diagnostic criteria were subjected to different forecast accuracy measures involving the use of RSME, MAE, MAPE, and Theil's U. Interestingly, the battery of tests results in a unified and best-fitted model for all the variables was the SARIMA (2,0,2)x(0,1,1)12. Detailed results can be made available upon a request from the author.

In-sample and dynamic forecasted values

The tables below show the PPUR actual, forecasted values, and estimated losses for 2020 and 2021 using the SARIMA (2,0,2)x(0,1,1)12. A detailed 60-month forecasted value from 2020 to 2024 for all the PPUR monthly revenue and international and domestic tourist arrivals, assuming that other tourism demandfactors are held equal, may be made available upon request.

Table 1. Comparative losses of Puerto Princessa Underground River (PPUR) during the first two years of COVID-19 pandemic (2020- 2021).

Period	Revenue (in Php)	International tourist arrivals	Domestic tourist arrivals
2020	76,296,626.00	117,904	156,362
2021	96,701,279.00	163,537	179,325
Total	172,997,905.00	281,441	335,687

Table 1 presents the comparative losses of PPUR from 2020 to 2021. In 2020, a total of Php76,296,626.00 was lost because of the intense community lockdowns in the city. In 2021, however, the PPUR still incurred a total of Php96,701,279.00 million losses because of the low international and domestic tourist arrivals. A total of 117,904 international tourists could have arrived at PPUR in 2020. The minimal improvement in tourist arrival still caused a loss of 163,537

international tourists in the same year. The highest international tourist arrival losses were incurred in December 2020 and February 2021. Meanwhile, there was a dwindling loss of 156,362 domestic tourist arrivals in 2020, while 179,325 tourist arrivals retracted in the potential domestic tourists during 2021. The detailed tests reveal that the highest domestic tourist influx was incurred in May 2020 and 2021.

Dynamic forecast from 2022- 2024

The potential annual revenues and expected international and domestic tourist arrivals for PPUR are displayed below. Had there been no pandemic, these amounts would have been extremely valuable for the sustained livelihood of the employees and the other businesses around the area.

Table 2. Dynamic forecasted values for Puerto Princessa Underground River (PPUR) monthly revenues (Php), international, and domestic tourist arrivals from 2022-2024 using SARIMA (2,0,2)x(0,1,1)12.

Year	Revenue (in Php)	International tourist arrivals	Domestic tourist arrivals
2022	96,792,990.00	176,294	175,500
2023	96,794,818.00	188,715	171,898
2024	96,796,035.00	200,822	169,017
Total	290,383,843.00	565,831	516,415

Table 2 presents the potential annual revenues that PPUR could gain for 2022 and the expected revenues in 2023 and 2024. An augmenting PPUR revenue by the PPUR is expected from 2022 to 2024 amounting to Php 290,383,843.00. This amount indicates how the PPUR exigently can bounce back effectively and cope with the compulsory health and safety protocols during those periods compounded with the existence of COVID-19 variants. Had there been no pandemic, the potential international tourist arrivals would have increased from 2020 to 2024 equal to 565,831 tourists annually. Meanwhile, the domestic tourist arrivals were estimated to decline over time thereby resulting in an estimated 516,415 tourists in the same period. Detailed results for the monthly forecasted values for the PPUR revenue, andits international and domestic tourist arrivals are available upon request from the author.

Forecasted Puerto Princesa Underground River (PPUR) expenses and foregone PPUR per capita revenue

The alpha value of 1 outperformed the other values considered for the smoothing constant in the SES forecasting for the PPUR revenue. It displays the lowestvalues of MSE, RSME, and MAPE. The estimated PPUR operating expenses with the absence of the pandemic is approximately Php82,000,000.00. A detailed result of the selection of the alpha is available upon request.

The key informant interviews among the 18 DOT-Accredited Tour Operators as of February 28, 2022, affirmed a total of 5 operators offered pre-pandemic PPUR tour package equal to Php 2,500.00; 1 operator offered similar package for Php 2,250.00; 7 operators offered it for Php2,200.00; and 5 operators offered such package for Php2,000.00. The estimated average forgone per

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capita expenses are Php2,230.56. This provides an overview of how substantial the losses are of every forgone tourist to PPUR despite the limited number of key informants due to mobility restrictions of the imposed health protocols during the data collection.

Puerto Princesa City Gross City Domestic Product (GCDP)

It is imperative to contextualize the potential effects of the forecasted losses and potential gains on the local economy of Puerto Princesa City. The table below highlights the pre-pandemic economic performance of the city.

Table 3. Puerto Princesa General City Domestic Product (GCDP) from 2018-2020 (Php), Puerto Princesa City.

Industries	Gross City domestic product		
	2018	2019	2020
Agriculture and forestry	1,439,597	1,557,257	1,692,843
Fishing Industry	9,603,770	10,182,691	10,083,627
Services	36,116,821	38,725,474	33,315,287
Total GCDP	47,160,188	50,465,422	45,091,756

Source: PSA Press Release (2021)

Table 3 highlights Puerto Princesa's GCDP consisting of Agriculture, Forestry, Fishing industry, and Services. From 2018 to 2019 the pre-pandemic GCDP of Puerto Princesa is increasing whereby the city gained 7 percent growth. Unlike in 2019, the pandemic reduced 2020 GCDP by 10.6 percent. This information was useful for contextualizing the revenue losses of PPUR from low tourist arrivals and the effects of such on the CBSTs and tourism-related businesses.

DISCUSSION

The Puerto Princesa Underground River (PPUR) greatly contributed to the local tourism industry of Palawan as it opened new prosperous economic opportunities for both the city and provincial levels as shown in Table 3. Its international accolades such as being a UNESCO World Heritage Site and one of the Natural Seven Wonders of the World became the sources of sustainable livelihood while protecting biodiversity and ecological integrity. Most of the locals there work in the PPUR and were assigned and trained as park rangers, community organizers, or technical staff.

However, the COVID-19 pandemic disrupted the well-flourished local tourism industry. It highlights the vulnerability of the industry as it is heavily reliant on physical interaction in creating a genuine recreational experience. Both domestic and international tourist arrivals are dwindling from 2020 to 2021 thereby reducing the PPUR generated revenue. This causes the reduction of employee salaries and negative spillover effects on the CBSTs and the tourism-related businesses located within and outside the host communities based on the results from the key informant interviews.

The number of actual visits in 2020 was only 32,465, roughly 23 percent of the 2019 international tourist arrivals (detailed tourist arrival trend may be requested from the authors). In 2020, the ideal number of international tourist arrivals should have been 150,373. In 2021, only 13 international tourists visited the site, and the anticipated arrivals were 163,549, hence there was a loss of 163,537 international visitors to PPUR as depicted in Table 1.

Similarly, there were only 29,423 actual domestic visits in 2020 and this is compounded by the high domestic tourist arrival losses in 2020- 2021 (detailed tourist arrival trend may be requested from the authors). The low domestic visits even before the onset of the pandemic might have potentially translated into a point of "saturation" of the authentic underground river cave tour experience. It concretized the PPUR SWOT analysis results, which predicted a slower growth of domestic arrivals as stated in the Puerto Princesa City Tourism Master Plan (2018-2027). This result emphasizes the following arguments (1) a need for critical analysis on the current state of local cultural appreciation of Filipino tourists and (2) potential environmental threats in times of economic disaster.

Given the multiple psychosocial factors that interplay with a tourist's decision to do a site visit, a more thorough analysis of cultural appreciation among Filipino tourists is imperative. This perceived possibility of declining cultural appreciation should be avoided as Kabote (2021) described domestic tourists as great information bureaus, tourism ambassadors, role models, and tour guides. This is significant during the pandemic because domestic tourists are one of the most consistent sources of income for the long-term operation of any tourist destination. They are one of the fuels of potential revenge travel that can push for the sustainable recovery of the country's tourism industry even if the national borders were closed for international visits (Chan, 2021). This proves that the arguments of Arbulú et al., (2021), Falk et al., (2024), and Bayih and Singh (2020) hold because regardless of the fragmentary domestic tourist visits to PPUR in 2021, it became the driver to continue operating despite the massive revenue losses.

Further, the low tourist arrivals from 2020 to 2021 created ease in the anticipated problem of over-tourism by the PPUR management as stated in their PPUR Business Plan (2020-2023). Previously, the PPUR management increased the carrying capacity of the site to 1,200 a day in 2014. According to the IUCN World Heritage Outlook report (2020), the negative externalities of excessive tourist arrivals are the noises and lights that disturb the bats during their diurnal resting inside the cave. Moreover, since most of the locals lost their livelihood due to low tourist influx, it compounded the illegal wildlife threats in the area as an alternative livelihood. Although it was rated as a low threat (5-15%), this still poses an alarming threat brought by the continuous poaching of the Philippine Cockatoo and the Palawan Forest Turtle. The PPUR park rangers continuously monitor the site to protect the ecological integrity of the site to avoid such incidences (Maclang, per. comm, January 12, 2022).

The CBSTs and the other tourism-related firms located within and outside of the host communities detailed the debilitating effects of low tourist influx in PPUR. Based on the results of key informant interviews among the proprietors and representatives of the business firms, the common adverse business outcomes among them include suffering from great revenue losses, additional operating costs born out of the ancillary costs of implementing health protocols (e.g. materials for sanitation purposes), employee retrenchment, and business closure at some point (Representatives of Balai Balai Travel Lodge, Eagle Eye Travel and Tours, Inc., El Mundo Bed and Breakfast/ Travel and Tours Agency, Kinabuchs, per. comm., February 2-4, 2022). Despite the negative consequences, the key informants formulated strategies (e.g. offering online delivery of their products, providing discount rates, venturing to other side businesses or jobs) to cope with the situation (President of Sabang Mangrove Paddle Boat Inc., Representatives of Sabang Sea Ferry Multipurpose Cooperative (SSFMPC), RC Store, PUJ driver from San Jose Terminal, Handy Native

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Craft Shop, per. comm., January 26 and February 2-4, 2022).

Generally, the COVID-19 recession has afflicted various industries, especially those that rely on the mobility of people (Klein and Smith, 2021). It is indeed a disaster that damaged the life support systems of the socio-economic structures of the tourism industry which is largely dependenton visitors' arrival and recreation activities (Bookmiller, 2023). The estimated employment losses notedin some of the considered tourism-related businesses were 100 million jobs in the world (WTTC, 2020). The pandemic as an economic disaster caused employee retrenchment, reduced salaries, livelihood loss, and exacerbated poverty that were collectively confirmed by the experiences of the tourism-related businesses within and outsidethe host communities of the PPUR.

Such an experience, therefore, calls for the different local and international ecotourism sites to improve their resilience to exogenous and endogenous changes where they develop adaptability conditions for change, healthy social and natural capital, strong social networks the enthusiasm of local leadership, economic development, especially that the pandemic is still present (Kristiana et al., 2021). This is also a call for systematic integration of social vulnerability, equality, and conflict sensitivity into the new policies, systems, and procedures of governments and organizations at every level to achieve inclusive sustainable development in create better communities (Chadda and Kundal, 2022). Škare et al. (2021) suggest that policymakers and tourism industry practitioners need to develop a "new crisis-readiness mechanism" to address the effects of the present and future pandemics. Sufficient empirical knowledge of the nature and real extent of the pandemic is needed.

The ability of the tourism industry to overcome this disaster will depend on the levels of organizational resilience and organizational learning (Bhaskara and Filimonau, 2021). A detailed summary of coping Strategies adopted by the various stakeholders of the Tourism Industry located within and outside the PPSRNP host communities is available upon request to the author.

CONCLUSION

This study was able to achieve its objectives of estimating the Puerto Princesa Underground River (PPUR) international and domestic tourist arrival losses in 2020-2021 amounting to 281,441and 335,687 tourists, respectively where it caused Php 172,997,905.00 revenue loss and hampered the CBSTs and nearby businesses. The Puerto Princesa Underground River (PPUR) management still incurred expenses but were lowerthan the estimated expenses of Php 82 million from 2020 to 2024. Its expected annual revenue would be approximately Php 96.7 million had there been no pandemic from 2022 to 2024. The forecasted international tourist arrivals in the same year were estimated to be around 176,000 to 200,000. While domestic tourist arrivals were forecasted to decline from 175,550 to a little over 169,000.

This study calls for the active participation of the government, business operators, and the PPUR in implementing sustainable operation strategies and accommodating the growing tourist influx from revenge travel. The Puerto Princesa Underground River (PPUR) management can utilize the forecasted values to prepare for the potential revenge travel, create more promotional digital materials that include the CBSTs, and develop a disaster risks management plan that covers the pandemic context as a disaster. Future researchers can compare the findings of this study to the current values using various forecasting techniques and broaden their discussion.

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