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The post COVID-19 tourism dilemma for geoparks in Indonesia

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ABSTRACT

This paper provides a brief account and rapid assessment, utilising qualitative data, of the impact of COVID-19 on domestic and international tourism activity in geoparks in Indonesia. The popularity of geoparks and associated heavy domestic visitation have given rise to over-tourism scenarios such as congestion, littering, waste disposal problems, ecological damage and localised declines in air quality. The COVID-19 Pandemic resulted in the closure of all tourist destinations in Indonesia, including geoparks and this had a significant economic impact on tourism actors when business premises were forced to close and staff in the tourism industry lost employment. Following closure of geoparks, management perceived a decline in negative impacts and realised the scope to undertake recovery work at damaged sites. However, evidence from wildlife tourism hotspots suggests increased poaching and deforestation has occurred in protected areas due to reduced conservation actions and ranger patrols during the lockdown. The Indonesian Government has developed a five-point action plan to assist recovery of the sector. Following the lifting of restrictions, previously observed, pre-COVID-19 Pandemic, heavy visitation problems have been re-established. This situation has the capacity to lead to negative visitor perceptions and unsustainable environmental conditions. We posit that the over-tourism 'problem' requires attention and research in order to provide solutions to on-going traffic congestion, crowding and associated negative impacts in Indonesian geoparks.
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1. Introduction and tourism context

The Indonesian geopark movement commenced in 2010, when the Ministry of Tourism authorised a series of scientific studies and developed geopark development programmes. This initiative resulted in the determination of 6 areas (Toba, Merangin, Rinjani, Gunung Sewu, Batur, and Raja Ampat) as national geoparks (Hidayat & Nasution, 2019). Furthermore, Batur Geopark was designated a Global Geopark in 2012, with the gazettal of Mount Sewu to global geopark status in 2015. Recognition of Indonesia's Geopark Programme has continued from that time with Ciletuh Palabuhanratu and Mount Rinjani becoming UNESCO Global Geoparks in 2018. In 2019 the Toba Caldera was added to the Global Geopark Network, and by 2020 Indonesia had commissioned 5 Global and 15 National Geoparks (Kunjana, 2018) (Fig. 1) with administrative responsibility for planning and development authorised by the National Geopark Committee for Indonesia (Legal Documentation and Information Network State Cyber and Code Agency, 2019; Ministry of Tourism and Creative Economy, 2020a).

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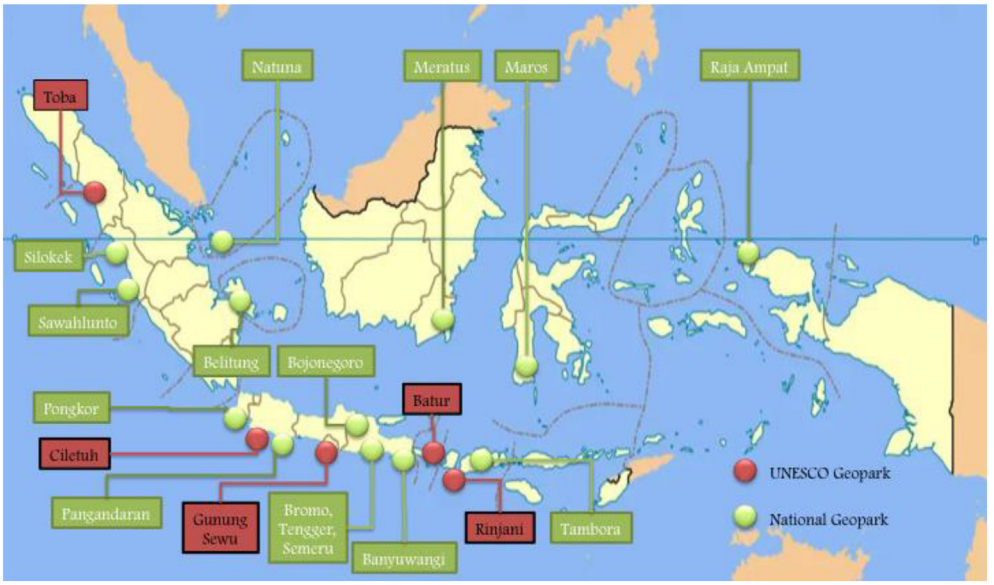

Fig. 1. Geoparks of Indonesia. (Source: Ministry of Tourism, 2019)

In addition to the fostering of tourism, the management of geoparks in Indonesia is designed to aid soil conservation, encourage sustainable water management, preserve plant and animal diversity, maintain ecosystems and lead to the appreciation of the nation's historical and cultural values (Ministry of Law and Human Rights, 2019; Sagala, Rosyidie, Sasongko, & Syahbid, 2018). To achieve these objectives, geopark managers carry out maintenance of geopark environments in collaboration with experts in the fields of geology, biology, environmental science, social culture, and tourism (Sagala et al., 2018). The overall aim is sustainable utilization of geological sites (geosites), improving community awareness about geological heritage (geoheritage) and the maintainance of geological diversity (geodiversity), biodiversity, and cultural diversity. Reducing any damage, via adequate environmental protection, is thus vital for public appreciation and the success of geoparks and other nature-focused tourism destinations in Indonesia. However, in recent times there has been much discussion about degradation of tourism sites and protected areas in many parts of the world as a result of over-tourism, increasing congestion and inappropriate visitor use (Capocchi, Vallone, Pierotti, & Amaduzzi, 2019; Kaiwa, 2017; Newsome & Hughes, 2018; Ruck, 2012; Tourism-Review, 2016). A recent review by Sumanapala and Wolf (2020) confirms the explosive growth of geopark tourism in the Asian region with the authors reporting erosion, littering and waste, vandalism, trampling and rapid retail outlet and infrastructure development occurring in association with increased tourism. Concerns regarding over-tourism and negative impacts occurring at Asian scenic/geopark destinations have also been raised by Newsome (2010), Newsome, Dowling, and Leung (2012), Dowling and Newsome (2017, 2018).

Given Indonesia's large population and substantive middle class (Boediono, 2020), especially in Java, domestic tourism in Indonesian geoparks continues to increase on a yearly basis leading to positive economic impacts on regional and community incomes. Indonesians also have a habit of traveling with family or friends and natural attractions have become very popular destinations for those people who live in cities. At the same time, the growth in tourism has resulted in negative impacts in the form of increasing traffic congestion, littering, inappropriate waste disposal, deterioration of air quality at tourist sites, trampling of vegetation and damage to geosites. Moreover, in the global context, over-tourism and associated negative impacts have become a widespread and established concern amongst tourism scholars (Dodds & Butler, 2019). However, in 2020 there was a catastrophic fall in international and domestic tourism around the world due to the COVID-19 Pandemic (Fisher & Grima, 2020; Nguyen & Coca-Stefaniak, 2020; UNWTO, 2020a; UNWTO, 2020b). The Pandemic has had significant repercussions for tourism in natural areas globally (Newsome, 2020) and in Indonesia. Accordingly, in this paper we report on the significance of pre COVID-19 Pandemic tourism conditions in Indonesian geoparks. We also describe what happened during the Pandemic lockdown and consider the implications of returning to 'normal' tourism in a post-COVID-19 future in Indonesia.

2. Methodological approach

This research uses qualitative research methods. Observations at selected geoparks were based on whether the geopark had received Global Geopark Network status and whether it was also a major tourist destination in Indonesia. Geoparks listed in Tables 1 and 2 are located in a National Tourism Strategic Area. Visitation data were obtained from park websites and impact data were derived from personal observations (first author) and opportunistic interviews with national park staff and geopark general managers. The rapid assessment data presented in this paper documents the observations, visual records and views of experienced Geopark and national park managers. Secondary data were obtained from the National Geopark Commission, Ministry

Table 1
Rapid assessment of Pre COVID 19 conditions (March, 2020) at selected Geoparks in Indonesia.

Geopark	Visitation Numbers of tourists/year		Revenue (Rupiah)	Local community employment and services	Env. and social impacts	Ecological disturbance	Site protection and rehabilitation work
	Domestic	Internat.					
Rinjani	669.422	21.409	3,900,000,000	Guides, porters and homestay Souvenir and Coffee Shop	Congestion, litter and waste, vehicle emissions	Savana fires caused by climbers, changes in monkey behaviour caused by feeding	Difficult to undertake due to heavy visitation, Patrols by forest police;
Bromo, Tengger, Semeru	669.422	21.409	22,860,000,000	Guides, porters and homestay Food Stall Souvenir 4WD transport	Congestion, litter and waste, vehicle emissions	changes in monkey behaviour caused by feeding	Difficult to undertake due to heavy visitation. Patrols by forest police
Batur	141.874	298.700	26,100,000,000	Guides, porters and homestay Souvenir Coffee Shop Restaurant Food Stall	Congestion, litter and waste, vehicle emissions	changes in monkey behaviour caused by feeding	Difficult to undertake due to heavy visitation. Patrols by forest police
Ciletuh	14,723,559		1,300,000,000	Guides, porters and homestay Souvenir Coffee Shop Traditional dancer	Congestion, litter and waste, vehicle emissions	Limestone mining that impacts on bat colonies	Difficult to undertake due to heavy visitation
Sewu	3.267.497		25,080,000,000	Guides and homestay Souvenir Food stall Souvenir shop Coffee Shop Coast guard	Congestion, litter and waste, vehicle emissions	Limestone mining that impacts on bat colonies	Difficult to undertake due to heavy visitation
Raja Ampat	3,500,000		26,000,000,000	Guides Hotel Staff homestay Souvenir Food stall Souvenir shop Coffee Shop Coast guard Boat rental Dive master	Congestion, litter and waste, vehicle emissions	Coral reef damage, oil pollution sourced from tourist boats	Difficult to undertake due to heavy visitation. Patrols by police
Pangandaran	4.108.724	8.194	22,800,000,000	Guides Hotel Staff homestay Souvenir Food stall Souvenir shop Coffee Shop Coast guard Bike Rental Boat rental Dive master	Congestion, litter and waste, vehicle emissions	Ecological impacts caused by feeding, coral reef damage, oil pollution sourced from tourist boats	Difficult to undertake due to heavy visitation
Belitong	308.440	19.063	63,500,000,000	Guides Hotel Staff homestay Souvenir Food stall Souvenir shop Coffee Shop Coast guard Bike Rental Boat rental Dive master	Congestion, litter and waste, vehicle emissions	Coral reef damage, oil pollution sourced from tourist boats	Difficult to undertake due to heavy visitation
Lake Toba	12,140,000	231.465	942,400,000,000 (The Total Tourism Revenue from 8 Regencies around Lake	Guides Hotel Staff homestay Food stall	Congestion, litter and waste, vehicle	Oil pollution sourced from tourist boats	Difficult to undertake due to heavy visitation

(continued on next page)

Table 1 *(continued)*

Geopark	Visitation Numbers of tourists/year		Revenue (Rupiah)	Local community employment and services	Env. and social impacts	Ecological disturbance	Site protection and rehabilitation work
	Domestic	Internat.					
			Toba)	Souvenir shop Coffee Shop Bike Rental Boat rental	emissions		
Maros	35,000		2,500,000,000	Guides homestay Souvenir Food stall Souvenir shop Coffee Shop Boat rental	Congestion, litter and waste, vehicle emissions	Illegal mining and logging. Pollution sourced from tourist boats	Difficult to undertake due to heavy visitation. Patrols by forest police;
Merangin	400,000		130,000,000	Guides homestay Souvenir Food stall	Congestion, litter and waste, vehicle emissions	Tourists remove fossils as souvenirs	Difficult to undertake due to heavy visitation. Patrols by forest police Gold mining and illegal logging
Ngarai Sianok-Maninjau	871,345		27.987.336.542	Guides Hotel Staff homestay Souvenir Food stall Souvenir shop Coffee Shop Coast guard Bike Rental Boat rental Dive master	Congestion, litter and waste, vehicle emissions	Air pollution from tourist vehicles	Difficult to undertake due to heavy visitation. Local wisdom has a role in protecting the environment
Silokek	12.466	252	1,797,347,083	Guides Hotel Staff homestay Souvenir Food stall Souvenir shop Coffee Shop Restaurant	Congestion, litter and waste, vehicle emissions	Air pollution from tourist vehicles	Difficult to undertake due to heavy visitation; Local wisdom has a role in protecting the environment.
Sawahlunto			1.420.541.475	Guides Hotel Staff homestay Souvenir Food stall Souvenir shop Coffee Shop	Congestion, litter and waste, vehicle emissions	Air pollution from tourist vehicles	Difficult to undertake due to heavy visitation. Lack of skills and knowledge regarding heritage building preservation
Natuna	69,197		100,000,000	Guides homestay Souvenir Food stall Souvenir shop Coffee Shop Transportation	Congestion, litter, waste and vehicle emissions	Army base and the island usually used for military training	Difficult to undertake due to heavy visitation
Meratus	283,259	688	No Data	Guides homestay Souvenir Food stall Souvenir shop Transportation	Congestion, litter, waste and vehicle emissions	Coal mining around the area	Difficult to undertake due to heavy visitation
Pongkor	Not opened		No revenue	–	–	Ex gold mining but illegal mining activities take place	–
Karangsambung-Karang Bolong	1.910.532		8,700,000,000	Guides homestay Souvenir Food stall Souvenir shop Coffee Shop Coast guard Boat rental Surfing rental	Congestion, litter, waste and vehicle emissions	Karst mining by locals	Difficult to undertake due to heavy visitation

Table 1 *(continued)*

Geopark	Visitation Numbers of tourists/year		Revenue (Rupiah)	Local community employment and services	Env. and social impacts	Ecological disturbance	Site protection and rehabilitation work
	Domestic	Internat.					
Banyuwangi	5,400,000		29,000,000,000	Guides Hotel Staff homestay Souvenir Food stall Souvenir shop Coffee Shop Coast guard Bike Rental Boat rental Dive master	Congestion, litter, waste and vehicle emissions	Forest fires	Difficult to undertake
Bojonegoro	1,200,000		1,546,000,000	Guides homestay Souvenir Food stall Souvenir shop Coffee Shop	Congestion, litter, waste and vehicle emissions	Oil mining	Difficult to undertake due to heavy visitation
Tambora	7.600		51,000,000	Guides homestay Souvenir Food stall Souvenir shop Coffee Shop	Congestion, litter, waste and vehicle emissions	Heavy pressure at weekends	Difficult to undertake due to heavy visitation;

Visitation data obtained from park websites and impact data derived from personal observations (first author) and opportunistic interviews with national park staff and geopark general managers.

of Tourism and Creative Economy, National Disaster Management Agency, the Geopark Management Agency, the National Park and Regional Tourism Service.

3. Over-tourism and impacts occurring in geoparks in Indonesia

All existing geoparks were well established as domestic nature tourism destinations long before the sites were gazetted as geoparks. Visitation would have been, and until COVID-19, especially prominent during weekends and holiday periods. Table 1 details recent pre-COVID-19 visitation data from a range of geoparks and also includes park information and management observations regarding services, environmental and social impacts and scope for rehabilitation work and repair of damaged infrastructure.

The establishment of geoparks in Indonesia is considered by Central Government to provide added value to existing destinations. The programme is supported by Central Government policies that provide for geopark development via financial support with the aim of enhancing the tourism potential of target areas. To increase tourist growth, in 2014–2019, the Central Government initiated a priority program to foster the development of tourism, namely: (1) infrastructure development, (2) facilitation of connectivity, (3) tourism village programmes (4), homestay programmes and (5) digital tourism (Ministry of Tourism, 2014). These programs were seen to be increasingly 'opening' Indonesian tourist destinations to the outside world. During this period, 15 new airports were built from a planned total of 128 new airports to be developed up to 2024 (Ministry of Tourism, 2019). The aim is to support tourism, especially for those stakeholders located in national tourism strategic areas where infrastructure such as roads were to be repaired and widened. Where programmes have been completed the situation has directly and indirectly increased visitation especially amongst domestic tourists. Growth in tourism has resulted in economic improvements in the target regions and has benefited stakeholders at tourism destinations (Ministry of Tourism, 2019).

A commonly reported consequence of tourism facilitation, such as improvement to infrastructure and services, is a rapid increase in visitation and the impacts that are associated with heavy visitor pressure and congestion (Table 1, Fig. 2). At this juncture it is important to note that some geoparks are also national parks. Of additional interest is the directive that every national park has specified visitor limitations, (Ministry of Environment and Forestry, 2018). For example, Gede-Pangrango National Park has 3 gates: Gunung Putri, Cibodas, and Selabinta. The maximum limit for Gunung Putri is 400 people per day, Cibodas 500 people per day, and Selabintana is 400 people per day. Geoparks, however, have no limitations on visitor capacity. Traffic congestion is common en-route to natural tourist areas and/or geoparks but this does not discourage people from visiting (Fig. 3).

Crowding is especially prevalent during the high season which not only overloads the demand on accommodation providers but also results in negative social and environmental impacts that are associated with traffic congestion, inadequate waste disposal and littering (Table 1, Figs. 4 and 5). The lack of environmental awareness amongst domestic tourists concerning site cleanliness makes littering and waste disposal particularly difficult problems to solve. This may be connected with observations previously reported by Cochrane (2006). She posited that Indonesian visitors to national parks and other protected areas have

Table 2
Rapid assessment of COVID 19 Pandemic lock down conditions (April, 2020) at selected Geoparks in Indonesia.

Geopark	Visitation Numbers of tourists/year		Revenue (Rupiah)	Local community employment and services	Environmental degradation	Disturbance of wildlife	Site protection and rehabilitation work
	Domestic	International					
Rinjani	No visitation recorded		No revenue collected	All tourism businesses and services closed. Tourism workers have returned to agricultural activities.	Reduced congestion, litter waste and vehicle emissions	Reported wildlife sightings. Scope for recovery of wildlife	Can be carried out
Bromo, Tengger, Semeru	No visitation recorded		No revenue collected	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Reported wildlife sightings. Scope for recovery of wildlife	Can be carried out
Batur	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Ciletuh	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Sewu	23,520 (data from January–May). No visitation during April and May)	18,633 (data from January–May). No visitation during April and May)	No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Raja Ampat	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Pangandaran	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Belitong	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Lake Toba	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Maros	No visitation recorded		No revenue	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Merangin	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Ngarai Sianok-Maninjau	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Silokek	No data		No data	All tourism businesses and services closed	Reduced congestion,	Scope for recovery of	Can be carried out

Table 2 *(continued)*

Geopark	Visitation Numbers of tourists/year		Revenue (Rupiah)	Local community employment and services	Environmental degradation	Disturbance of wildlife	Site protection and rehabilitation work
	Domestic	International					
					litter waste and vehicle emissions	wildlife	
Sawahlunto	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Natuna	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Meratus	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Pongkor	Closed		No revenue	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Karangsambung-Karang Bolong	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Banyuwangi	32,279	2269	No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Bojonegoro	No data		No data	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out
Tambora	No visitation recorded		No revenue collected	All tourism businesses and services closed	Reduced congestion, litter waste and vehicle emissions	Scope for recovery of wildlife	Can be carried out

Visitation data obtained from park websites and impact data derived from personal observations (first author) and opportunistic interviews with national park staff and geopark general managers.

more of a personal enjoyment/recreational emphasis rather than a knowledge seeking eco-centric awareness approach to park visitation. A visitor demographic that exhibits a dominant attitude concentrating around recreational activities, such as picnicking, amusement, partying and sport, may help to explain the situation evident in Indonesia today This is a trend reported by Newsome and Hughes (2018) that is increasing in the wider global context.

Other putative impacts associated with heavy domestic tourism at geoparks include mammal poaching (Tambora, Bromo, Tengger and Semeru) and bird poaching (Rinjani). Hunting activity is also known to result in forest fires (Table 1). Whether local communities or visitors are responsible for these actions remains unclear. Geopark managers' report that police conduct checks of all vehicles entering and leaving those geoparks which are also national parks (see later). People who are active around geoparks generally carry out agricultural activities because they are mostly farmers. For a geopark that is also a national park, it is very difficult for visitors or local people to carry out illegal hunting because of tight supervision. However, for a geopark that is not a national park, there is a strong possibility that illegal hunting can occur because there is a dearth of ranger patrols, police checks and monitoring.

While impacts such as trail erosion and damage to landforms, such as graffiti and site deterioration, are largely unreported from Indonesia (Newsome, 2010), where crowding occurs there is scope for overwhelming the efficacy of management presence and negative impacts are likely to occur. Furthermore, wider understanding of the impacts of tourism at geological attractions, such as geoparks, is an increasing aspect of tourism study and now an on-going and evolving component of the applied science of geotourism (Newsome et al., 2012; Dowling & Newsome, 2017, Dowling and Newsome, 2018 and Woo and Worboys, 2019).

Fig. 2. Crowding at Mount Rinjani Peak. August 2020. Source Rinjani National Park. Courtesy of Hery Cahyadi

Fig. 3. Traffic congestion at Bromo Tengger Semeru Geopark. August 2020. Source Bromo Tengger Semeru National Park. Courtesy of Hery Cahyadi

Fig. 4. Crowding at Pananjakan Sunrise Point of View at Mount Bromo Geopark. August, 2020. Courtesy of Hery Cahyadi

This is not withstanding the pressures and issues surrounding non-tourism related activities such as sanctioned and/or illegal mining (Table 1).

Fig. 5. Traffic congestion on route to Gede Pangrango National Park. August, 2020. Courtesy of Hery Cahyadi

4. COVID -19 in Indonesia

COVID-19 positive cases were first confirmed in Indonesia on March 2, 2020. The rapid spread of COVID-19 across the world and in Indonesia has had a significant impact on national and international tourism. The Pandemic has posed considerable challenges for the Indonesian Ministry of Tourism and Creative Economy with closed borders and lockdown causing massive reductions in international and domestic tourism and a sharp decline in economic activity. Closure of tourism facilities such as hotels, restaurants and the decline of tour operations resulted in lost income and forced people out of the tourism industry leading to a rise in unemployment. According to the Ministry of Tourism and Creative Economy (2020c) 1.4 million people lost their jobs from the formal sector (hotels, restaurants and tour operators), with 314,833 people losing employment in the informal tourism sector. These numbers do not reflect workers in other sectors allied to tourism such as transportation and trade. All tourist destinations and tourist attractions including geoparks and other protected areas were closed in April, 2020.

Before the COVID-19 shutdown, Indonesian Geoparks were experiencing a rapid and sustained growth in tourism numbers. For example, annual visitation data indicated 669,422 domestic and 21,409 international visitors at Rinjani Geopark. Batur Geopark recorded a yearly total of 298,700 international tourists, while Ciletuh had a total visitor count of 14,723,559 (Table 1). Following the disruption of international tourism, border closures and domestic lockdown, visitation to geoparks in Indonesia was halted (Table 2). Popular geoparks such as Rinjani, Bromo and Tambora recorded no visitation while others, such as Sewu, recorded substantial declines. While, at the time of writing, there are no actual visitation data for many sites it can be concluded that geoparks had very little or no visitation as inferred from the observation that all geopark related tourism businesses were closed (Table 2).

Most of the economic impacts fell on local community members who work as porters, guides, mountain guides and provide homestay services. There were no tourists at west Javan sites as the area was designated a red zone (high growth of COVID-19). The lack of tourists at Pangandaran National Geopark and Ciletuh Global Geopark severely impacted local communities. At Pangandaran, 80% of the community is dependent on tourism and almost 500 hundred accommodation providers had to close with most employees losing their jobs. For Ciletuh Geopark, tourism is not the main income for local communities, but the impact of COVID-19 was high. In the Sukabumi Regencies, where Ciletuh geopark is located, Indonesia recorded the highest rates of COVID-19 infection along with associated negative health impacts on the community (COVID -19 Working Committee, 2020). A hinderance to effectively responding to the effects of the COVID-19 Pandemic in the future is the absence of a specific policy or strategy for the geopark network. All policies relating to tourism are of a general nature and regulated by relevant Government agencies, but these policies do not identify any specific geopark or tourist attraction.

Prior to the spread of the COVID-19 Pandemic, geopark managers constantly had to deal with crowding, littering and inadequate waste disposal, as well as traffic congestion. During the pandemic the priority became more about economy (revenue, income, and employment) including revenue targets set by the Central Government being difficult for geoparks to achieve (Ministry of Tourism, 2020). However, there were no job losses in various sectors of park management, because geopark and national park staff remained as permanently contracted government employees. This provided scope for park managers and rangers to review and document geopark conditions in the absence of heavy visitor pressure (see Table 2). Tables 1 and 2 allow comparison of pre-COVID-19 and then lockdown conditions at selected geoparks.

We draw attention to preliminary data collected in regard to environmental and social impacts, ecological disturbance, site protection and rehabilitation work. Pre-COVID–19 tourism conditions led to environmental impacts such as traffic congestion, littering and vehicle exhaust pollution. Putative ecological impacts, including disturbance to wildlife were also recorded. It was also difficult for park management to undertake site protection and restoration. Additionally, there was evidence of collateral mining damage at some geoparks (Table 1). During lockdown there was relief from heavy visitor pressure and some recovery from environmental stress in the form of reduced congestion and declines in litter and pollution from motor vehicles. There were

also opportunities to carry out rehabilitation and repair work (Table 2). However, there is no reported evidence that any site restoration has taken place.

The observations of geopark park staff, documented in this study, include increased wildlife sightings due to the release of domestic visitor pressure (Table 2). Potential ecological benefits noted (such as wildlife sightings), in selected geoparks, due to the COVID-19 shutdown and lack of tourism, are probably over-stated and not likely to be a long-term trend. This contention is supported by evidence from protected areas and wildlife hotspots elsewhere in Indonesia. For example, satellite data published by WWF Germany (2020) shows a substantial increase in unauthorized logging and forest loss across Indonesia. The COVID-19 related decline in conservation work and protected area ranger patrols throughout Indonesia has also led to increased poaching and facilitated the illegal trade in wildlife (FFI, 2020; Mongabay, 2020a, 2020b; Newsome, 2020). At the same time, while the lockdown has impeded conservation programmes, potentially destructive major infrastructure projects have been temporarily halted. The future relocation of Jakarta to east Kalimantan and a HEP project in Sumatra exist as serious threats to existing natural areas and tourism resources (Mongabay, 2020b).

5. General response to the pandemic

Prior to the Pandemic general tourism authorities in Indonesia acknowledged that social and environmental sustainability is important for the future (Oxford Business Group, 2021). In order to help the overall industry and its associated actors deal with the COVID 19 Pandemic, the Ministry of Tourism and Creative Economy (2020e) issued the following strategy:

5.1. Support for the tourism industry and creative economy actors

Support provided to industry/creative economy actors/performers occurred in the form of exemptions from BPJS (Social Security Administering Body) insurance costs, reduction of electricity and water costs, relaxed rental fees, local tax levy relief and relaxation of bank lending constraints. It was important for potential recipients to be immediately informed with regard to technical instructions and definitive time settings from when the policy came into force. Budget support and reallocation was in cooperation with hotels, tourism transportation companies and the food and beverage sector. It was necessary to explain to the public the form of cooperation that would be carried out, whether purely like the procurement of goods and services (business contracts) or purely in the form of social care for business owners undertaken as a contribution from Government to community in the midst of the crisis.

5.2. Tourism education subsidies

Subsidies were provided to students who are currently studying in both public and private tertiary education institutions in Indonesia. This was especially the case where parents who have to support students were affected by the Pandemic.

5.3. Strengthening of the tourism mitigation standard operating procedures (SOP)

By reflecting on the many natural disasters, force majeure, that have occurred in Indonesia such as earthquakes, volcanic eruptions and disease outbreaks there is a need for immediate strengthening of the Indonesian Tourism Mitigation SOP. With part of the process involving cross standardization with SOP's developed by UNWTO and WHO. A strategic step was for the Ministry of Tourism and Creative Economy to prepare strengthened SOP's early on, so that when the Pandemic subsides the Ministry will be able to implement a recovery strategy without delay.

5.4. Priority in revamping destinations

It is widely acknowledged that Indonesia still has a lot of work to do in regard to cleanliness of protected areas, visitor safety, public health, environmental conservation, effective regional regulations and provision of appropriate halal tourism services (Ministry of Tourism and Creative Economy, 2020c). One such strategy is increasing the role of local tourist associations in tourism villages. All of this requires additional budget allocation and intensive assistance so that the revamping of destinations is carried out in accordance with the global standards of sustainable tourism destination management.

5.5. Foreign tourism health regulations

Strengthening the health regulations requirements of foreign tourists will be an important step forward. Using the experience of the COVID-19 Pandemic, tourists from countries/regions that have been to areas that are prone to disease outbreaks, will be required to go through health screening in order to obtain an entry permit/visa to Indonesia.

On June 15, 2020, the COVID-19 Pandemic Handling Task Force announced plans to gradually re-open tourism areas such as geoparks. Areas were reopened with a maximum of 50% visitor capacity. Areas that were permitted to open were located in regencies and cities in the previously allocated low COVID-19 risk green or yellow zones. Other zones were regulated in accordance with regional readiness to deal with infected people and upon the advice of area managers. These areas included: (1) marine tourism areas, (2) water conservation areas, (3) adventure tourism areas, (4) national parks, (5) nature tourism parks, (6) forest

Fig. 6. Traffic congestion queue to enter Pangandaran Beach. **June 2020. Copyright Pangandaran Marine Tourism Agency. Courtesy of Hery Cahyadi.**

Fig. 7. Holiday period foot traffic along the Mt. Rinjani climbing route. August, 2020. **Copyright Mt Rinjani National Park. Courtesy of Hery Cahyadi.**

parks, (7) wildlife reserves, (8) geoparks, (9) natural tourism non-conservation areas such as botanical gardens, zoos, tourist villages, and nature tourism areas managed by the community (Task Force for the Acceleration of Handling COVID-19, 2020).

After the COVID-19 Pandemic Handling Task Force announcement some tourist destinations once again returned to the pre-COVID -19 Pandemic conditions and were once again characterized by traffic congestion, crowding and littering (see Table 1 prior to lockdown). Figs. 6 and 7 strongly indicate a rapid 'back to 'normal' scenario following the relaxation of restrictions. Under such conditions there has been no time to reflect on the pre-Pandemic visitation scenarios in geoparks, set desired conditions and environmental quality standards and set new management goals. Instead, the previously recorded heavy pressure and congestion rapidly returned to pre-Pandemic levels (Table 1). In addition to this, it was observed by park staff that many health protocols required by the government were violated by visitors, raising the fear that COVID-19 would continue to spread amongst visitors to geoparks and in host communities.

6. Future tourism management in Indonesian geoparks

While acknowledging the catastrophic impacts of the COVID-19 Pandemic on the world, and in Indonesia, it is also time to reflect on how the tourism-environment nexus has been positively and negatively affected pre and during the COVID-19 Pandemic. Geoparks have been a great success in Indonesia in driving tourism and providing not only business opportunities for tourism providers, but additional opportunities for all Indonesians to enjoy nature. Given the pre-Pandemic growth in international and domestic tourisim, along with the income generated and the positive impact derived by the community before the occurrence of the Pandemic, geopark tourism has much potential if managed properly. However, as discussed previously, over-tourism is a widespread problem in Asian protected areas and has led to social and environmental impacts such as traffic congestion with associated vehicle emissions, littering and waste disposal problems and disturbance to wildlife. This has also created a situation where it is difficult for park staff to undertake protective conservation work and site maintenance (Table 1). This is where general strategies instigated by the Ministry of Tourism (2020) can lead the way for positive change. Moreover, *Priority 4* (section 5.4) acknowledges that there is still a lot of work to do in regard to the cleanliness of protected areas, environmental conservation

and effective regulation of regional tourism development. One problem that needs to be overcome is the multiple involvement of many agencies in geopark management. A plethora of managers and administrators can result in differing opinions as to how a park is managed. For example, Mount Rinjani has different management bodies for the national park and geopark components of the protected area, and there is a lack of coordination regarding management objectives. Some geoparks also have a cultural preservation agency which further complicates co-ordinated decision making.

Given that decision making in Asian countries is often dominated by a 'top down' approach (for example, Nguyen, Lee, & Newsome, 2020) additional opportunities remain for involving local people in the decision making process. The sustainability of protected areas, such as geoparks, must involve local communities so that they themselves can clearly appreciate the benefits to be derived from associated tourism (Farsani, Coelho, & Costa, 2011). Increasing public awareness and fully involving local stakeholders in the development of tourism will foster local community participation in the conservation of natural resources and help to mitigate hunting and/or illegal logging and mining.

In terms of wider environmental policy, adjacent extractive land uses need to undergo appropriate environmental impact assessment to ensure minimal impact on valued tourism areas (for example, Newsome & Hughes, 2016). In-keeping with the geopark mandate described earlier there needs to be a concerted effort to educate visitors about natural and cultural heritage. Currently there appears to be minimal educational programming and scope for visitor learning. Indeed, a comprehensive learning programme is vital in order to maintain UNESCO recognised status for a geopark. There are many examples of educational strategies that be employed in this sphere of geopark public engagement (for example Dowling & Newsome, 2018). Erfurt-Cooper (2014) also includes examples of approaches to the management of volcanic tourist destinations. More recently, Purnama (2020) provides a much-needed Indonesian perspective on the intersection between tourism and geology. His work considers visitor usage and the features and activities that attract visitors to volcanoes. He stresses the importance of safety and the importance of providing learning opportunities for tourists. Above all, additional effort is required in the setting of appropriate management strategies to address traffic congestion, crowding and inappropriate visitor behaviour. Indonesia is not alone in having this tourism dilemma.

7. Concluding remarks

As previously highlighted by Butarbutar and Soemarno (2013) pre COVID-19 environmental problems such as soil erosion, degradation of waterways, disturbance to wildlife, pollution, wild-fires, littering, negative socio-cultural impacts and poorly developed and implemented management plans remain a problem in Indonesia. In particular, pre-COVID Pandemic domestic tourism conditions at many Indonesian Geoparks and protected areas were characterized by heavy visitation, traffic congestion, crowding and degraded environmental conditions. The over-tourism 'problem' requires acknowledgement that there are negative impacts not only for the environment, but for the host community and possibly for certain visitor demographics like international visitors who may dislike crowded situations. Although there are economic benefits, there are actual and potential environmental and social costs.

Traffic congestion and crowding may lead to visitor dissatisfaction and negative social media reporting about the site as a valued tourism destination. It is possible that critical social media reviews and concerns about crowding may result in a decline in international tourism interest in a post COVID-19 future. Furthermore, Buckley (2020) reports that the COVID-19 Pandemic provides protected area managers and tourism researchers with many opportunities for further study. As pointed out in this paper, this situation fits for Indonesia. What is required now is visitor demographic research to determine social carrying capacity/crowding tolerance for each attraction. Geopark management plans are in need of review regarding their effectiveness as environmental and tourism management documents. The opportunity to increase funding to help finance park management requires an assessment of public preparedness to pay more to enter various protected areas. The scope for site protection and restoration during periods of heavy visitation remains a problem. Our preliminary assessment of pre and during the COVID-19 Pandemic tourism situation in geoparks in Indonesia calls for a systematic and extensive programme of research that needs to be supported with robust methodology. The focal question being how can we tackle the problem of over-tourism and associated negative impacts in Indonesian geoparks in a post-COVID- 19 world?

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