# Need Assessment for Coastal Tourism Area in the Face of Tsunami Risk: The Case of Pangandaran

Harkunti Pertiwi Rahayu [a,*], Louise K. Comfort [b], Devina Khoirunnisa [a], Dewi Nurhasanah [a]

[a] Department of Urban and Regional Planning, Institut Teknologi Bandung, Jl. Ganesa no. 10, Coblong, Bandung, 40132, Indonesia
[b] GSPIA, University of Pittsburgh, Pittsburgh, Pennsylvania, United States
Corresponding author: *harkunti@pl.itb.ac.id; harkunti@gmail.com

*Abstract*—As the fourth world's longest coastline, coastal tourism has become a significant component of Indonesia's economy. Approximately 57% of this coastline is prone to the deadliest coastal hazard, i.e., tsunami. The progressive development of the tourism industry has created a massive increase in built infrastructure, hotels, roads, electrical and water distribution systems, and an increased number of people, including tourists and tourism workers, in rural coastal tourism areas. Due to the tsunami threat, rural coastal tourism regions' economic and social development faces enormous potential losses in lives and infrastructure and disruption of economic activity, especially for small and medium business enterprises. However, this coastal tourism industry has failed to engage in proper disaster risk reduction strategy and tourism business resilient building in most tourist destination regions in Indonesia. To address these complex problems, this study explores the adaptation of the concept of Business Continuity Plan of a single enterprise to upscale to an area or zone, i.e., the Area Business Continuity Planning, to enhance the holistic disaster-resilient tourism industry in Indonesia, with Pangandaran as the study location. As a newly formed regency, Pangadaran is an emerging super-destination tourism area designated by national and provincial governments. This region experienced a devastating tsunami in 2006, and even today, its coastal communities live under the threat of tsunamis that South Java Megathrust can generate. Based on an in-depth and holistic study, this study finds the Pangandaran coastal tourism resilience level, recognizing critical stakeholders and identifying the collaborative BCP strategies in Pangandaran.

*Keywords*— Area business continuity plan; coastal community resilience; resilient tourism; collaborative planning; Pangandaran regency.

## I. INTRODUCTION

As a country with the fourth-longest coastline globally, i.e., 81,000 km, Indonesia's coastal tourism industry has become a major component of Indonesia's economy, with a significant contribution to the national GDP after the oil and gas sector [1]. However, the geodynamic position of Indonesia has made most of its coastal region highly prone to tsunami threats. According to the Indonesian Disaster Risk Index [2], approximately 44 % of coastal cities and regencies are exposed to the deadliest coastal hazards, such as tsunamis, threatening coastal economic sectors and the built environment, infrastructures, and communities [3].

The direct and indirect disaster impacts on the tourism sector affected the exposed area and the surrounding regions, i.e., cities and regencies, in Indonesia [4]. Indirect economic impacts of natural disasters have been introduced to disaster risk management for the past several decades [5]. However, they were often unrecorded and suffered for extended periods, especially in developing countries [6]. Different types of hazards might cause different indirect impacts on the tourism business activities, e.g., businesses closed due to the COVID-19 pandemic [7], small accommodation businesses collapsed due to financial crises [8], and disrupted coastal tourism business continuity due to earthquake and tsunami events in Indonesia [9], [10], [11].

Meanwhile, a study by [12] showed that Indonesia's tourism sector was one of the most affected in Southeast Asia during the late 1990s regional crisis due to severe economic crisis and social-political uncertainty. However, there were overwhelming tourist arrivals outside the region due to plummeting prices and favorable currency exchange rates. Conventional crisis management seemed not applicable [12], [13], and an appropriate business continuity plan was needed.

Business continuity, also known as business resilience, is the ability of a business to continue to perform or to bounce back at pre-defined acceptable levels and time following a disruptive event or disaster [11]. A business continuity plan (BCP), often known also as a business resilience plan, consists of prevention, mitigation, preparedness, and recovery ability to respond to disruption due to disaster impacts [14], [15]. A study by [16] has highlighted the importance of resilient stakeholder collaboration that involves tourism businesses and policymakers for enhancing effective tourism business resilience through disaster risk reduction (DRR) strategy and business continuity plan (BCP).

In the last two decades, business continuity plans have been introduced to prevent a disaster's prolonged and permanent impacts on businesses. However, the BCP concept in the tourism sector might be overlooked in developing countries due to the lack of resources, risk knowledge, skills to mitigate risk impact, and assistance in developing the business-level continuity plan, especially in smaller enterprises (SMEs) [10]. The Area BCP is a planning framework for creating a sustainable and resilient business district by integrating the continuity plans of the businesses with all other essential functions, e.g., electricity, water supplies, and road network [17].

Previous studies indicated that Area BCP can significantly improve economic resilience toward disaster by collectively reducing potential losses and speeding up the recovery process [18], compared to business-level BCP, which only focuses on its financial resilience. To build business area resilience, we need to pay attention to increasing resistance to disaster impacts by investing in risk prevention, mitigation, and preparedness and reducing recovery time by developing collective plans. However, this study pinpointed the failure of engaging the resilience of tourism businesses with Disaster Risk Reduction (DRR) strategy and Business Continuity Planning (BCP) practices in most tourist destination areas in Indonesia, especially in coastal regions.

Thus, this paper aims to present the discussion on the need assessment of Area BCP for coastal tourism in the face of tsunami risk, based on the intensive three-year study 2020-2022 in Pangandaran, by identifying the collaborative BCP Strategies. The process development to identify the collaborative BCP Strategies is further discussed based on the resilience assessment of the Pangandaran tourism industry. Pangandaran is a newly formed regency that experienced a devastating tsunami in 2006, and even today, its coastal communities live under the threat of tsunamis that South Java Megathrust events can generate.

## II. MATERIALS AND METHOD

This theoretical framework discusses BCP practices, risk-informed coastal tourism development, and stakeholder engagement in resilience building to better understand the critical issues of the need assessment for coastal tourism area resilience.

### A. Area BCP and BCP Practices

BCP is a documented plan developed by the business enterprise to minimize damage and loss in emergencies while continuing their core business [19]. Disruption can happen anytime, either caused by natural or artificial disasters or terrorism [20], [21]. Enterprises are expected to return to business as soon as possible to prevent more indirect losses caused by the business disruption. The longer a business needs to recover, the higher the probability of dropping out of its market [22]. In a crisis after a disruption, it is hard for some enterprises to recover quickly due to a lack of resources. For this reason, a Business Continuity Plan (BCP) helps ensure business recovery and minimize impacts in the first place.

Business resilience depends on the capacity to maintain acceptable functionality during and post-disaster and fully recover within a specified duration [23]. Resilience can be achieved by ex-ante and ex-post mitigation decisions [24]. For example, ex-ante mitigation is developing a continuity plan against a particular hazard. Having a BCP in place can shorten recovery time, as business recovery can be uncertain [23] or even possibility of business drop-out [22]. Large businesses with more resources for disaster recovery have a bigger chance to survive. Others, such as small and medium enterprises (SMEs), are often severely disrupted and struggle to recover. Some factors hinder SMEs' speedy recovery, such as higher damage levels and lack of access to capital [25]. To minimize disruption impact on SMEs while increasing economic resilience in the business area, it is necessary to have strategic partnerships among penta-helix's key stakeholders, i.e., government, business entities, communities, academia, and NGOs or Media, to enhance the capacity and ability for recovery or bounce-back or built-back-better. It is essential that the collaboration strategies for the business area can be integrated into city/regency contingency plans and zoning regulations to build resilient cities/regencies [26], [27].

BCP for natural disasters entails business impact analysis [22], [28], strategic planning [3], [22], crisis communication team and management [3], [28], [29], resource management [3], [22], [29], evaluation and maintenance [3], [22]. Area BCP is the concept of expanded BCP to a wide area as a framework and direction of disaster risk management by stakeholders [30]. Area BCP aims to prevent the supply chain in the focused business sector from being damaged [17].

Asset protection in the form of structural mitigation is found to be a crucial factor for BCP [11]. Knowledge of influential stakeholders is beneficial before formulating tourism business area resilience in coastal regions. Stakeholder analysis will clarify each stakeholder's roles, priorities, opinions, and points of view to help achieve sustainable collaboration towards business and economic resilience [17], [31].

In developing countries, industries are mostly agglomerated in an industrial zone [30]. When disaster strikes, the whole area will be affected. Business disruption and basic infrastructures might be heavily damaged, affecting the industry's supply chain [32]. Like other agglomerated economic zones, tourism-based areas rely on the functioning of interrelated sectors within the system. Several vital sectors supporting tourism development, i.e., the hospitality sector, attractions and events sector, transport sector, travel organizers and intermediaries' sector, and destination organization sector, are also known as 5A's (Accessibility, Accommodation, Amenities, Attraction, and Activities) [27]. Disruption in the 5A's will affect the tourism business area. Thus, the collective BCP of these business sectors in the

tourism area becomes critically necessary to enhance tourism resilience at designated tourist destinations. If one business sector is not resilient, it will affect the overall businesses resilience in the tourism area [11], [17].

## B. Risk-informed Coastal Tourism Development

Developing long-term and short-term disaster risk reduction plans depends mainly on current risk and capacity level information. Planning can be very ineffective without knowing the present risk and capacity level. One of the outstanding works is the need for a standardized measure for risk level assessment. However, measurement criteria might differ depending on hazard type and level as well as the characteristics of the vulnerable community. In this study, the community is extensively assumed to be all stakeholder elements of the penta-helix, i.e., community, government, business enterprises, academia, and media. Further, the community in this study is better represented by permanent residents, non-permanent residents, visitors/tourists, and community-based organizations because they are not only the object but also the subjects of disaster and its response situations.

Meanwhile, risk-informed policymaking and planning aim to prioritize appropriate measures and utilize resources efficiently [31]. However, applicable metrics and guidance for assessment are not always available in all types of communities [23]. The existence of some community resilience assessment approaches was not comprehensive enough to measure the business's resilience. For example, the Coastal Community Resilience (CCR) assessment tool [33] could not highlight community-based business disruption, even though it consists of eight components: (a) governance, (b) society and economy, (c) coastal resource management, (d) land use and structural design, (e) risk knowledge, (f) emergency response, (g) disaster recovery, and (h) warning and evacuation. This study noted a need to suit the indicators to metrics appropriate for a business area's resilience.

Rahayu et al. [11] identified business resilience factors in 4 categories: (1) Swift Recovery Factors, (2) Experience and Knowledge of Disasters, (3) Emergency Response Plan, and (4) Asset Protection. The first three categories contribute to speeding up recovery, while the last contributes to reducing damages. This aligns with the four resilience elements: robustness, redundancy, resourcefulness, and rapidity (4Rs). Robustness and redundancy reduce the potential disaster impacts or disruption. In contrast, resourcefulness and rapidity lessen the time the community needs to recover to its normal state after the disruption. Each resilience indicator must contribute to one of the four community resilience elements.

As the study focuses on a tourism-based community, several aspects of tourism resilience must be introduced to the assessment. The Tourism Resilience Index (TRI) is a suitable tool to assess the tourism industry's business resilience level [34], [35]. The compound indicator represents a critical aspect of sustainability in the tourism industry, i.e., business and operations plans, disaster preparedness plans, marketing, workforce, federal, state, and local resources, and resource access and knowledge. Coastal tourism will benefit from the TRI by identifying strengths and weaknesses in the system. These indicators can provide an essential basis for measuring

progress towards resilience goals and help identify actions to overcome vulnerabilities and maintain long-term sustainability.

However, in measuring the tourism business area's resilience, it is necessary to assess various aspects from a multi-stakeholder perspective. Therefore, preliminary works of this study have synthesized and adopted the CCR assessment, business resilience, and TRI indicators to formulate a comprehensive set of the Tourism Business Area Resilience Measurement Tools, as shown in **Error! Reference source not found.** below. This measurement tool consists of 8 elements, i.e., Accessibility, Accommodation and Amenities, Attraction-Activities, DRR, Tourism-related business, Community, Government Institutions, and Visitors, with 120 detailed indicators (see also [36]. This Tourism Business Area Resilience Measurements Tool can be used to map multi-stakeholder mapping processes, which will be discussed in the next section.

| Stakeholder Category | Tourism-related | | | Disaster Risk Reduction |
|---|---|---|---|---|
| | Accessibilty | Accomodation & Amenities | Attraction & Activities | |
| Tourism-related businesses | | | | |
| Community | | | | |
| Government Institutions | | | | |
| Visitors | | | | |

Fig. 1 Tourism Business Area Resilience Measurements Tools

## C. Stakeholder Engagement in Resilience Building

One of the challenges of tourism areas after significant disasters is the decline in visitors. Thus, a disaster continuity plan in a tourism area needs to prioritize safety assurance for visitors. Tourism resilience is also a pivotal factor in promoting sustainable tourism development. True resilience requires knowledge-based decision-making, accommodating all interrelated elements. Consequently, this will require the cooperation of many stakeholders, even at a city level, such as in a tourism-based area. Stakeholder analysis is necessary to understand their behavior, interests, and influence on decision-making [37] to collaborate effectively. The Influence-Capacity matrix helps develop an engagement strategy for collaborative planning [37]. Tourism and DRR call for different sets of stakeholders. In tourism, stakeholders include government and land managers, the tourism industry, the community, and visitors [38]. Disaster-related stakeholders have a role in swift recovery in a disaster that impacts the tourism business. The use of **Error! Reference source not found.** is to aid the stakeholder identification in tourism continuity planning from a tourism component perspective.

## D. Pangandaran Community-based Rural Tourism

Located on the south coast of West Java Province, Pangandaran is a new regency formed on October 25, 2012, as an expansion of a former southern portion of Ciamis Regency. This regency plays an essential role in West Java Province as well as national economic development from the perspective of the tourism sector. Pangandaran has been stated

as one of the National Strategic Tourism Development Areas (KSN), according to the National Tourism Development Master Plan 2010-2025 (Rencana Induk Pengembangan Kepariwisataan Nasional – RIPPARNAS). The decree had a significant impact on the massive development of the coastal tourism industry in the regency, attracting more than doubled the number of visitors from 2.4 million in 2015 to 5.6 million in 2019, including its multiplier effect on other sectors, such as trading, services, hotels, restaurants, transportation. This impact contributed to the increase of locally generated revenue and influenced the demographic profile. By 2020, the population will be 73% dominated by working-aged people, 43% in service, 28% in agriculture, and 29% in manufacturing sectors, according to Statistics of Pangandaran Regency; see also Fig below.
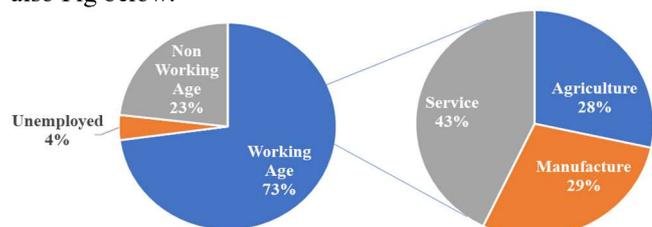


Fig. 2 Contribution of the Working-age Population and Sector Income Distribution in Pangandaran in 2020

However, Pangandaran was stricken by the devastating tsunami on 17 July 2006, with more than 200 people killed and numerous cafes and shops within 20 m of the coastline being damaged and washed away. Severe damage to almost all structures within several hundred meters of the waterfront, such as collapsed sea walls and hotel debris [35]. Even today, Pangandaran is still highly exposed to the more significant potential of the South Java Megathrust tsunami threat, which will disrupt the tourism industry. According to [39], seismic gaps in South Java Megathrust can generate tsunamis with a 4.5 m average maximum height along the entire south coast of Java. After the 2006 tsunami, it took 12 months for the Pangandaran tourism business to recover. Thus, to anticipate future megathrust tsunamis, protecting the area from the social and economic disruption caused by tsunami occurrences becomes critically needed.

In contrast, Pangandaran has also been stated as the provincial strategic area in the West Java Spatial Plan (RTRW Jawa Barat 2009-2029) and a tourism growth center (RPJMD Jawa Barat 2018-2023), making this a priority area that must be protected from various disruption, including tsunami. However, the Spatial Plan (Rencana Tata Ruang Wilayah—RTRW) and Mid-term Development Plan (Rencana Pembangunan Jangka Menengah Daerah—RPJMD) have not stated any solid disaster mitigation and prevention initiatives within the plans. Further, the Pangandaran Regency has not yet established any contingency plan for tsunamis and other coastal hazards.

The agglomeration of tourism gives added value to the destinations. Competition and cooperation on a local and regional scale frequently increase the chain's generated value [32]. Pangandaran, one of the famous coastal tourist destinations in southern Java, applies the concept of agglomeration.

Based on the 2019 West Java Province Tourism Masterplan, this study covers five coastal sub-districts of Pangandaran Regency with significant tourist attractions. They are Cimerak Sub-district, Cijulang Sub-district, Parigi Sub-district, Sidamulih Sub-district, and Pangandaran Sub-district, which will be investigated further its resilience as Community-based Rural Tourism (CBRT) (see map in Fig. ).

CBRT extends community-based tourism (CBT) in a rural setting. It requires the community's involvement and participation in managing tourism activities within the community. CBRT aims to extend the benefits of tourism activities to the community in rural areas in return for their involvement in the development process and during the sales and delivery of the products and services [40].
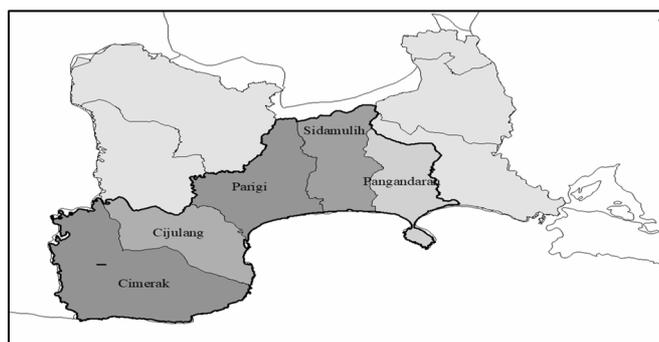


Fig. 3 The Five Sub-districts of Pangandaran Regency Tourism Area

Thus, for developing the Pangandaran Coastal Tourism Area-BCP, a mixed-method approach was used, combining qualitative and quantitative surveys for three purposed steps in developing coastal tourism area resilience in responding to critical issues of coastal tourism need assessment. The assessment includes tourism area resilience assessment, stakeholder analysis, and mapping and identification of Area-BCP practices for stakeholder collaboration. See also **Error! Reference source not found.** below.

As highlighted in this theoretical framework, the need for risk-informed coastal tourism development can be quantitively measured by tourism area resilience assessment. Inter-relating systems in tourism business call for resilient stakeholder collaboration, which is qualitatively measured by stakeholder analysis and mapping. Then, the need for a participatory approach in BCP practices is qualitatively measured by identifying Area-BCP practices for stakeholder collaboration.

TABLE I
ISSUES AND STEPS PROPOSED FOR PANGANDARAN COASTAL TOURISM AREA RESILIENCE.

| Issues in the case study area | Proposed step |
|---|---|
| Need for Risk-informed Coastal Tourism Development | Tourism area resilience assessment |
| Inter-relating systems in the Tourism Business calls for resilient stakeholder collaboration. | Stakeholder analysis and mapping |
| Need for Participatory Approach in Area Business Continuity Planning | Identification of Area-BCP Practices for Stakeholder Collaboration |

*E. Methodology*

This study's holistic and integrated framework analysis is developed by recognizing the patterns and time frame of the

critical issues and the proposed steps, also shown in
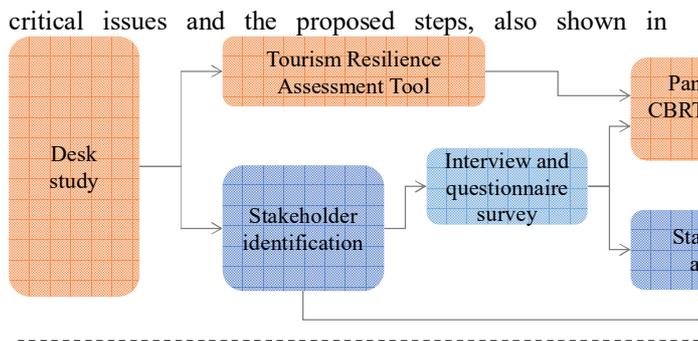


Fig. . Integrated proposed solutions answered the three crucial issues. This framework analysis consists of a desk study, development of a tourism resilience assessment tool,

stakeholder identification, interview-questionnaire-observation survey, Pangandaran CBRT resilience level analysis, stakeholder analysis, and Area BCP development through FGD.

Secondary data, including three-tier legal documents and plans on tourism development, spatial policies and plans, and disaster management at the national, provincial, and regency levels, are obtained for the desk study. The desk study aimed to recognize the critical issues further, initiatives to build sustainable tourism businesses, initiatives for disaster risk reductions to build a resilient tourism industry, and actors involved in the initiatives. Three-tier secondary data on tourism development policy and plans, i.e., spatial policies and plans and disaster management from the national, provincial, and local levels, were collected for the desk study.
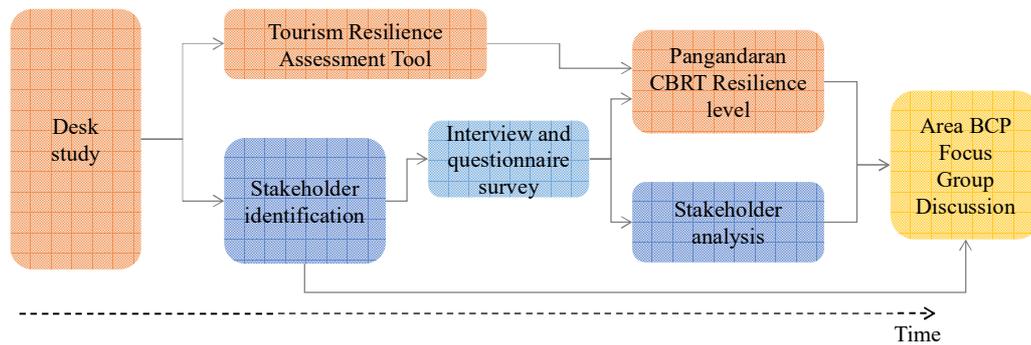


Fig. 4 Study method flowchart

The primary data sources are a questionnaire survey, purposeful interviews with the stakeholders, and Focus Group Discussions to develop Pangandaran CBRT Resilience Level, Stakeholder Analysis, and Area-BCP. Secondary data obtained from the tourism industry perspective consisted of the Master Plan for National Tourism Development (RIPPARNAS 2010-2025, based on Government Regulation no 50/2011), followed by the Master Plan of West Java Tourism Development (RIPPARPROV 2015-2025), and Master Plan for Pangandaran Tourism Development (RIPPARKAB 2015-2025). From the perspective of spatial and development plan, the data obtained were from the National Spatial and Development Plan (RTRW 2008-2028), the West Java Province Spatial and Development Plan (RTRWP 2009-2029), and the Pangandaran Regency Spatial and Development Plan (RTRW Kab 2018-2038).

Further, the Tourism Area Resilience assessment tool was developed by integrating the coastal community resilience framework [33] and tourism resilience index [10], [34] and synchronized to business resilience factors [11], tourism 5A's [38], [38] and data obtained from policy and planning secondary data review. The Coastal Community Resilience, the assessment tool in this study, consists of 8 components. Each component consists of several identified indicators to measure the area resilience using all four resilience elements (4Rs), considering the nature of coastal tourism development in Pangandaran. These 4R are robustness, redundancy, resourcefulness, and rapidity. One hundred twenty indicators were developed for the resilience assessment; see the Appendix.

A holistic approach to crisis management, including Area BCP, involves considering the different phases of disaster

management [3]. The stakeholder analysis was done separately in four disaster management phases. Using the developed indicator, interviews were conducted with stakeholders from the triple helix, i.e., government institutions, private businesses, and the community. In addition to measuring the overall coastal community and tourism resilience level in Pangandaran, information regarding stakeholder influence and capacity in each disaster phase was also collected for stakeholder mapping and analysis.

Based on the output of the desk study, i.e., Tourism Assessment Tools and Identified Stakeholders, an in-depth semi-structured interview was conducted using purposive sampling on the identified key stakeholders, 69 respondents. These respondents represented the Pentahelix elements, i.e., the government officials, SMEs and business owners and workers, government-owned organizations, and tourists at the tourism object in Pangandaran. To verify the interviewed data collected, a triangulation was conducted with data from field observation, which was conducted through town watching by the researchers and local people. Due to the COVID-19 Pandemic restriction on fieldwork, the in-depth interview and field observation were conducted during 2021-2023. Especially for the interview, a hybrid approach was used, i.e., online and offline, followed by offline meetings and studio in 2022 and the first semester of 2023.

As a result, the resilience level in Pangandaran CBRT is measured and analyzed based on all data obtained from document review, in-depth interviews, and town watching to recognize the performance values of each resilience indicator. These values are then clustered and presented in a spider diagram. The total resilience level is understood as the

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existing capacity or modality to cope and respond to disaster. In contrast, this level is called a residual business function in the Area BCP model.

In parallel, a stakeholders' analysis was conducted to recognize further the key actors in building and enhancing the area's business resilience to tsunamis. The stakeholders mapping used an influence-capacity matrix covering four phases of disaster management: prevention, mitigation, preparedness, emergency response, and recovery, as well as elements of the tourism business.

TABLE                                                            II
below.

Then, the Area BCP Framework was developed through sensitizing public engagement through FGD. The Focus Group Discussion (FGD) aimed to formulate an Area Business Continuity Plan (Area BCP), attended by representatives of 16 identified institutions from private and business sectors, community, and government institutions. These representatives of stakeholders were selected using the theoretical framework matrix (see **Error! Reference source not found.**). The list of identified stakeholders can be seen in

TABLE II
PANGANDARAN CBRT ACTING STAKEHOLDER IDENTIFICATION FOR TARGET RESPONDENTS.

| Stakeholder category | Tourism-related | | | Disaster Risk Reduction |
|---|---|---|---|---|
| | Accessibility | Accommodations & Amenities | Attraction and Activities | |
| Private/businesses | | State Electricity Company; Local Water Company; Local small businesses | Tour and Travel Agent Association (ATTAP); Local small businesses | |
| Community | | Hotel and Restaurant Association (PHRI) | Pangandaran Tour Guide Association (HPI) | Indonesian Red Cross (PMI); Disaster Preparedness Cadets TAGANA |
| Government institutions | Public Works and Human Settlement Agency; Road Network Department; Transportation Agency | Development Planning Agency; Marine, Fisheries, and Food Security Agency; Social, Human, and Village Development Agency | Agency of Tourism and Culture, Environmental Agency | Pangandaran LDMO, Fire Department; Community Early Preparedness Forum (FKDM) |
| Visitors | (visitors as target survey respondents but not participating in FGD) | | | |

## III. RESULTS AND DISCUSSION

### A. Resilience Level Assessment

The resilience level in the Pangandaran Tourism Area is measured using the developed Tourism Business Area Measurement Tools, which synthesized the Coastal Community Resilience Assessment [33], Tourism Resilience Index [34], [34] and Business Resilience Assessment from Rahayu et al. [11]. The assessment represents resilience in four elements: robustness, redundancy, resourcefulness, and rapidity [41]. Overall, the result of the study, as shown in TABLE                                III
Below found that the Pangandaran Tourism Area Business Resilience Index is low, i.e., 33.71%, as shown in TABLE III and Fig Still below the target performance, i.e., 50%. This 33.3% of the area business resilience index is essential to see how low the area resilience modality for the residual business function is shown in **Error! Reference source not found.**, for the business to bounce back to a predefined level and time following the disruption.

TABLE III
TOURISM AREA RESILIENCE PERFORMANCE IN PANGANDARAN CBRT

| Tourism Area Resilience Elements | Performance (%) | |
|---|---|---|
| | Pangandaran CBRT | Target performance |
| Governance | 53.33 | 50 |
| Society & economy | 28.91 | 50 |
| Coastal resource management | 21.43 | 50 |
| Land Use and Structural Design | 35.00 | 50 |
| Risk Knowledge | 35.13 | 50 |
| Warning & Evacuation | 52.54 | 50 |
| Emergency Response | 37.50 | 50 |
| Disaster Recovery | 1.56 | 50 |
| Total Tourism Area Resilience Index | 33.71 | 50 |

However, both elements of the governance and warning & evacuation aspects show the highest scores, i.e., 53.33% and 52.54%, slightly above the target performance. Surprisingly, the disaster recovery aspect is the lowest, i.e., 1.56%, far below the target performance; it seems there is no lesson learned from the 2006 tsunami in the tourism business area.

Overall results show that the resilience index of the Pangandaran Community-based Rural Tourism Area (CBRT Area) graphically represented in the spider web shown in Fig. The result of this resilience assessment was presented to the acting stakeholders during the Focus Group Discussion. In the Pangandaran CBRT Area, only two of the eight elements measured using 120 Tourism Business Area Measurement Tools indicators are above its target performance of 50%.

Fig. 5  Tourism Area Resilience Performance in Pangandaran CBRT

The disaster recovery indicator is found to have the lowest performance compared to other indicators. According to the discussion during FGD, the deficient performance of disaster recovery aspects was due to the absence of disaster contingency plans and recovery plans in Pangandaran Regency. Moreover, private and business entities are unprepared for disaster recovery or business continuity plans.

## B.  Stakeholder Analysis and Mapping

In the Area BCP, stakeholders' and resilience assessments are critical to utilize the potential and available resources efficiently. Disaster risk management and the tourism sector stakeholders are identified from a review of relevant public documents on three-tier policies and planning from national, province, and local governments. Stakeholders' assessment aims to recognize the role, responsibilities, and resources/power of stakeholders to enhance the sustainability of the Pangandaran tourism industry in the context of Area BCP. Resilience assessment involves evaluating the capabilities of business and area of business in preparing for, responding to, and recovering from various disruptions due to tsunami impacts.
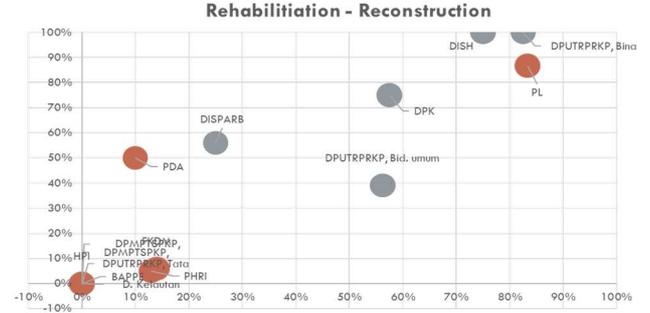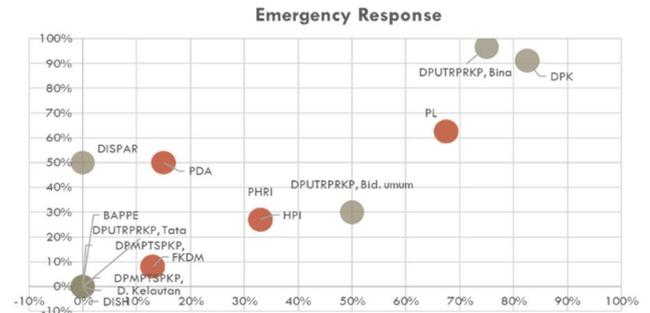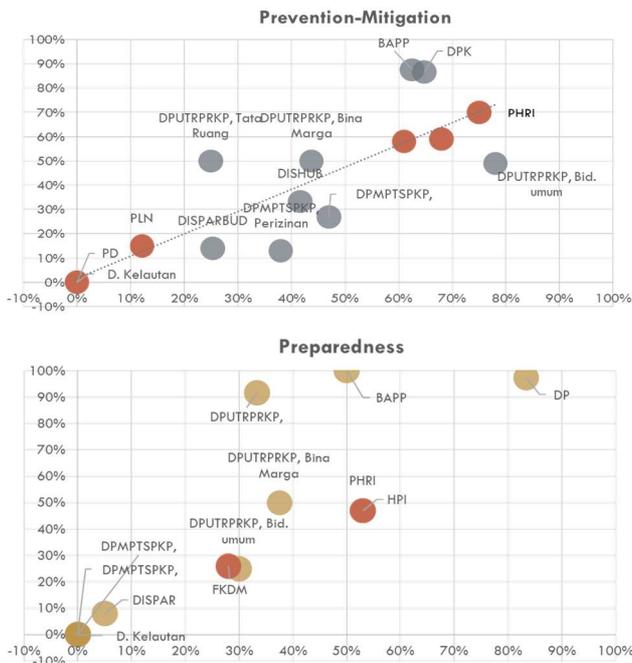






Fig. 6  Pangandaran CBRT Stakeholder Matrix in the Disaster Management Cycle

By conducting a stakeholder assessment, it will be easier to determine critical efforts and actors in increasing resilience based on influence and capacity mapping results. Then, identified stakeholders become the target of assessment in research. In December 2020, an in-depth interview with key stakeholders was conducted in Pangandaran Regency. Results from interviews are mapped onto the Influence-Capacity matrix on four disaster management phases: prevention and mitigation, preparedness, emergency response, reconstruction and rehabilitation, and overall tourism business (see example in Fig. ).

Stakeholders analysis results are shown in Fig.  they indicated that the actors having the most influence and highest capacity are three governmental agencies, i.e., BAPPEDA-Local Development Planning Agency, DPKPB-Local Disaster Management Office and DPUPRTRKP-Local Public Works Agency—Road Network Division; and three non-governmental organizations, i.e. PHRI-Indonesia Hotel and Restaurant Association, HPI-Indonesia Tour Guide Association, FKDM-Early Preparedness Community Forum. The synergy of these six governmental and nongovernmental actors will play an essential role in the development of Area BCP. The PHRI-Indonesia Hotel and Restaurant Association, with its highest capacity, influence, and vital networking, can lead the non-government sector to invest in comprehensive disaster risk reduction initiatives in the tourism industry, covering not only the safety and sustainability of the tourism business but also the business environment and area of Pangandaran Community based Rural Tourism (CBRT) Area.

The Local Development Planning Agency could lead stakeholders in the area of CBRT to develop participatory contingency plans that focus on disaster preparedness and emergency response, as also shown in TABLE IV
.

TABLE IV
CRITICAL STAKEHOLDERS IN PHASES OF DISASTER MANAGEMENT
IN PANGANDARAN CBRT

| Phase | Key Stakeholders |
|---|---|
| Prevention & Mitigation | Local Development Planning Agency (BAPPEDA); Local Disaster Management Office (DPKPB) Indonesia Hotel and Restaurant Association (PHRI); Indonesia Tour Guide Association (HPI); Early Preparedness Community Forum (FKDM) |
| Preparedness | Local Disaster Management Office (DPKPB) |
| Emergency response | Local Disaster Management Office (DPKPB); Local Public Works Agency—Road Network Division (DPUPRTKP) |
| Rehabilitation & Reconstruction | Local Public Works Agency—Road Network Division (DPUPRTKP); Local Transportation Agency (Dinas Perhubungan); National Electricity Company (PLN) |
| Tourism business | Local Development Planning Agency (BAPPEDA); Hotel and Restaurant Association (PHRI); Tour Guide Association (HPI) |

Fig. also shows that the Local Development Planning Agency is actively involved in prevention and mitigation and the tourism business, the Local Disaster Management Office is engaged in preparedness and emergency response, and the Local Public Works Agency—Road Network Division is involved in rehabilitation and reconstruction.

However, several non-government institutions are involved in prevention and mitigation capacity, namely the Indonesia Hotel and Restaurant Association, the Indonesia Tour Guide Association, and the Early Preparedness Community Forum. In contrast, the National Electricity Company is actively involved in reconstruction and rehabilitation. The synergy of lead actors and key stakeholders is significant in strengthening each phase of disaster management during the development of Area BCP for Pangandaran CBRT.

*C. Area BCP Formulation FGD*

The final focus group discussion (FGD) was conducted following the resilience assessment and stakeholder analysis. This FGD invited all critical stakeholders identified from the documentary review and stakeholder assessment. The FGD aimed to present tourism resilience assessment results and discuss the proposed framework for Tourism Area BCP with all acting stakeholders in Pangandaran CBRT. The stakeholders agreed upon a discussion on how Area BCP can be applied in Pangadaran CBRT, covering three steps. First is capacity building, which is based on having a unified perception and agreement of what disaster risk reduction (DRR) efforts have been made in general and in tourism business continuity. Existing DRR programs, initiatives, progress, and achievements were listed. Second, is a discussion on the agreement of common challenges and difficulties in improving disaster risk reduction and the tourism resilience index identified. Finally, practical steps for

tourism resilience and Area BCP were formulated among the invited stakeholders and researchers.

*D. Progresses in Disaster Risk Reduction Efforts*

Disaster is a strategic issue in the Pangandaran Regency. The 2006 tsunami experience is one reason for preparing a tsunami risk reduction program. Several initiatives have been taken to increase resilience to tsunamis in the tourism business area of Pangandaran Regency. Regarding spatial planning, Pangandaran Regency has considered tsunami-hazard zones in its regional development plans. As stated in the Pangandaran spatial plan, there are efforts to mitigate risk in coastal areas, i.e., providing green open space and building abrasion barriers. Detailed evacuation routes already have a spatial structure, the tsunami hazard zone areas incorporated in the spatial pattern plan, zoning regulation for the tsunami-prone area, including regulations on tourism in tsunami-prone areas, and evacuation shelters. The planning zone clearly states four areas: permitted, permitted but limited, not permitted but conditional, and not permitted at all. There are also efforts to develop critical infrastructure, i.e. hospitals and schools in yellow hazard zone or moderate disaster-prone areas.

Pangandaran Regency also has made efforts to increase awareness and preparedness. There is a Disaster Education Tourism Goes to School program for elementary students and Mitigation for Pre-schooler (Anak TK Mitigasi - ATM). In this program, disaster education material is delivered in an exciting way, such as through songs that are easy for children to understand. Besides, there is also disaster education for women in the Mitigation Education for Woman program (Bunda Belajar Mitigation - BBM). This program aims to increase understanding of disaster risk and disaster management in disaster preparedness exercises. Pangandaran Regency has also formed a disaster forum, namely the Disaster Preparedness Group (Kelompok Siaga Bencana - KSB), in 8 villages.

Pangandaran Regency LDMO conducts socialization of the 20-20-20 concept during the tsunami to the community and tourists. This 20-20-20 concept was adopted from Ron Harris's socialization program in 2017 for the community in South Java to anticipate tsunami, which stated that if you fell 20 seconds, this might be followed by tsunami arrival in 20 minutes. Thus it would be best to go to a higher ground, over 20 m above the mean sea level. The government also collaborates with the national and local media to ward off misinformation related to tsunami disasters. To facilitate access to information to increase public and tourist awareness, the Pangandaran Regency government manages the Pangandaran Actual Disaster Information (PADI) Web and Tourism Guide Center, which provides information for tourism purposes and during emergencies.

Pangandaran District has installed tsunami evacuation signs along the evacuation route to support the effort to reduce the risk of tsunami disasters. Of the 300 signs installed, 100 are in good condition. The Pangandaran Regency government uses existing buildings such as schools, mosques, and hills as tsunami evacuation shelters. Sirens were installed to ensure that tsunami information was disseminated quickly. LDMO collaborates with PHRI to install sirens in several hotels. Four of the 16 EWS tsunamis were functioning correctly, while the

rest were damaged. The sirens are checked regularly on the 26th of every month. Pangandaran Regency has an ambulance and CSR from the private sector in an emergency. To anticipate a disrupted electricity supply in an emergency, PT. PLN plans to build a substation in Bulaksetra, Parigi, and Pangandaran District.



Fig. 7  Well-designed Tsunami Shelter (up) and the Observation Deck in Pangandaran (down)

However, given the impact of massive development in the coastal tourism industry and anticipation of a South Java mega thrust tsunami, the existing tsunami evacuation plan needs to be improved. The number of residents and visitors should be well incorporated as people at risk in the vulnerability and capacity assessment. The capacity of evacuation routes and shelters should be reviewed and improved, not only to anticipate the number of people at risk, but also the shelter's strength and height to anticipate tsunamis. The left picture of Fig. 7 below is a well-designed tsunami shelter; however, the height of the observation desk used as a temporary shelter needs to be reviewed.

*E.  Common Challenges*

Although there have been initiatives to implement disaster risk reduction programs in Pangandaran District, several challenges prevent the program from running optimally. One is the financial challenge. Fund allocation is more focused on post-disaster than pre-disaster. Funding schemes such as CSR or grant funds can be an alternative source. However, the minimal participation of the private sector has made this option unoptimal. Private sector participation is low, based on the number of hotels implementing DRR. The involvement of hotel owners and staff in DRR training is also low.

In terms of spatial policies, several obstacles occur in policy implementation. Zoning regulations, including those for tourism areas, are poorly followed, including land conversion for critical land uses, such as mangrove forests. Property development problems often occur between the government, hotels, and business owners. Land ownership conflict for road and access infrastructure also limits DRR efforts, especially in evacuation routes. Also, the building code for earthquake and tsunami policy has not been in place, with 130 hotels in Pangandaran not protected from disasters.

Pangandaran is a newly developed area. The problem of inadequate infrastructure conditions has occurred since Pangandaran was still in the Ciamis administrative area. Another problem is human resources. Many government institutions lack personnel, and most emergency responders are volunteers. Thus, it is challenging to depend on existing resources. Although efforts have been made to increase awareness and preparedness, it is shown that Pangandaran Regency has low knowledge regarding disaster preparedness, not only among local people but also among visitors and tourists.

Future Steps and Actions towards Tourism Resilience and Area BCP. Pangandaran Regency needs to make several efforts to increase the resilience of its tourism business area. Coordination among stakeholders is vital to resolve the funding and participation problem. Government initiatives are needed to increase the proportion of disaster funds. LDMO needs to work with the community and tourism organizations/associations to increase residents, migrants, and tourists' awareness. Cooperation must also be improved with volunteer forums or other humanitarian organizations to increase volunteer involvement.

Increased resources are needed for disasters. Aside from human and material resources, good infrastructure and the right technology can improve the resilience of an area. For some critical infrastructure, such as electricity, it is necessary to have EWS for PLN because electricity supply is vital. It is essential to improve the regional spatial plan, if possible, up to the local level to understand the tourism area's vulnerability and capacity factor better. It will help detail the disaster risk reduction planning. The most important thing is to have an action plan for the tourism area for legal strength and disaster funding.

*F.  Discussion*

The resilience level assessment plays a critical role in producing a risk-informed continuity plan and building resilience in Pangandaran CBRT by highlighting areas for improvement. Resilience assessment involves evaluating the ability of a business or area to prepare, respond to, and recover from various disruptions.

Meanwhile, the stakeholder assessment included identifying and analyzing various actors who have influence and capacity to develop the continuity of the tourism business. This stakeholders' assessment aims to understand stakeholders' roles, responsibilities, and resources in the context of the BCP Area. A stakeholder assessment makes it easier to determine critical actions and actors in increasing resilience based on influence and capacity mapping results. Then, the identified stakeholders become the target of stakeholders' assessment in this research.

Results of resilience level assessment for the overall area of tourism businesses show 33.71%, as shown in **TABLE III** . and Fig. This is categorized as low resilience and low capacity for residual business function; see **Error! Reference source not found.**, of the business area to cope, respond, and bounce back after disruptions due to the impacts of the tsunami disaster.

In an Area BCP, stakeholder and resilience assessments are critical to efficiently utilizing the available resources. The stakeholder assessment results show three governmental

institutions and three non-government organizations, which play vital roles in increasing the area's business resilience due to their capacity and influence for DRR and building resilience. Fig. The cooperation between them could simultaneously influence and help other actors collectively increase the resilience level of the business area, which means expanding the residual area business function. On the other hand, the cooperation among these six institutions will increase the $\alpha$ angle to reduce the time it takes to recover once a disaster occurs.
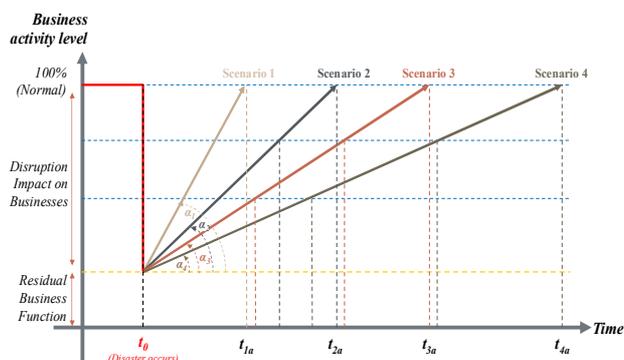


Fig. 8  Business recovery plan for Area BCP

According to Caselli and Ono [22], resilience might determine whether a business will bounce back to normal after a disruption or failure. Fig illustrates the time frame scenario needed for an area to return to regular business-level activity. The $\alpha$ angle in **Error! Reference source not found.**. gets narrower as more indicators surpass the 50% target performance, resulting in faster business recovery. The steeper the line, the quicker it will recover to normal conditions. The line slope degree depends on the $\alpha$ function in the graph. The function represents tourism area resilience indicators that have been fulfilled. The more indicators fulfilled, the greater the $\alpha$, and the less time needed to recover. The normal condition pictured with the area business function has reached 100%.

Disaster is a strategic issue in Pangandaran Regency, and several initiatives have been taken to increase resilience towards tsunamis in the tourism business area of Pangandaran Regency. The initiatives are emphasized in spatial planning and increasing awareness and preparedness for the local people and tourists. Although there have been initiatives to implement disaster risk reduction programs in Pangandaran District, there are some critical issues in implementing DRR efforts towards tsunamis, i.e., financial challenges, spatial policy implementation, inadequate infrastructure conditions, human resources, and low participation from the private sector. Examples of economic challenges are related to funding and budget limitations. While challenges of spatial policy implementation are enforcement of regulations not yet fully implemented, i.e., SOP for evacuation and implementation of zoning regulations, there are conflicting policies for spatial regulation for the coastal area between regency and province. There is overlapping zoning regulation for coastal regions and small islands in the regency, Pangandaran Regency Spatial and Development Plan (RTRWKab Pangandaran) under the authority of Regency and Spatial Planning for Coastal Areas and Small Islands (RZWP3K) under the authority of Province. Critical issues in inadequate infrastructure are minimal facilities and infrastructure, especially accessibility, building quality, and land acquisition for DRR public facilities such as Tsunami Shelters. Critical issues on low participation from the private sector consisted of many hotel owners not participating in tsunami DRR and only 30% of hotel owners participating in disaster outreach held by the government. Not all business owners conduct training for their employees. Besides, only a few hotels provide their hotel for tsunami shelters.

Moreover, Pangandaran Regency has taken various steps to increase tsunami resilience, including for the tourism sector, for example, including a tsunami hazard zone in its spatial plan. The plan summarizes strategies such as creating green open spaces and building structural mitigation to deal with abrasion. Evacuation routes are included in the spatial structure plan. Apart from that, Pangandaran Regency also installed evacuation signs along the coast and used existing buildings as evacuation places. Existing evacuation plans need to be improved. In terms of preparedness, Pangandaran Regency has initiated programs such as the Disaster Education Tourism Goes to School program for elementary students, Mitigation for Pre-schoolers (Anak TK Mitigasi - ATM), and Mitigation Education for Woman program (Bunda Belajar Mitigasi - BBM). The region is also socializing the 20-20-20 concept to communicate tsunami warnings effectively. For early warning, there are sirens to disseminate tsunami information quickly. However, there are only two tsunami sirens, so the early warning system does not cover all tsunami-prone areas. For this reason, the government is working with communities such as the Early Preparedness Community Forum - FKDM, the Disaster Resilience Community Group - KSB, and the Disaster Preparedness Cadet -TAGANA to disseminate early warning information via communication radio. These stakeholders' efforts have become the modality of Pangandaran Regency, especially the Tourism Business Area, in dealing with the tsunami disaster. To achieve regional resilience, what needs to be improved is planning for post-disaster rehabilitation and reconstruction efforts.

Coordination among all stakeholders involved in area business resilience is vital to resolving the problem. The most crucial step is to have an action plan for building an area of business continuity plan concerning disaster management. This plan should include risk assessment, community awareness and preparedness, tsunami prevention and mitigation, access to early warning systems, emergency response, and recovery plans.

The Area BCP needs to be reviewed and updated regularly to keep up with the emergence of the latest technology and information. Contingency plans are also required for tourism areas, including determining communication in times of crisis and building a backup system for essential services such as sanitation, clean water, communications, and electricity during times of emergency. It is necessary to consider insurance and financial readiness by encouraging the business community to have appropriate insurance that covers the risk of natural disasters, including tsunamis. Further, local governments need proper budget planning in the form of reserve funds or access to aid funds to accelerate business recovery, especially for affected SMEs. This Area BCP is then

expected to be integrated with disaster management and regional development plans such as Spatial and Development Plans (RTRW).

## IV. Conclusion

The indirect impacts of disaster events are often unrecorded but might be suffered for extended periods, especially in developing countries. Disaster impacts on the tourism sector were found to impact the affected area and the surrounding cities and regencies in Indonesia. Due to this reason, having commercial zones prepared with a business continuity plan is essential. However, this was a challenge in the tourism area run by micro, small, and medium enterprises. Area BCP concept is introduced.

This study conducted a pilot development of Area BCP in a tourism region of Pangandaran Regency, West Java, Indonesia. The Area BCP development involved three steps: resilience level assessment, stakeholder identification and analysis, and a Focus Group Discussion (FGD) with critical stakeholders as a beginning step for participatory Area BCP development. The result from the FGD was considered in the related institutions' strategic plan for improving tourism resilience against natural disasters from coastal hazards. Participatory discussions for Area BCP need to be held periodically. Along with that, there is a high need to strengthen collaboration and the monitoring and maintenance aspect of Area BCP. Forming a board of representatives for Area BCP promotion could also be a helpful tool to speed the development process. Besides institutional capacities, businesses should be involved and strengthened through entrepreneurship and innovativeness in their business frameworks.

Finally, this study proposes an Area BCP framework for Indonesia's emerging coastal tourism areas. The framework combines concepts necessary to develop an Area BCP for a coastal tourism area. To conclude, the existence of an Area BCP will strengthen the resilience not only of the tourism industry in the region but also of the Pangandaran Regency DRR Master Plan and the Pangandaran Regency Spatial and Development Plan.

## Data Availability Statement

All data, models, or codes supporting this study's findings are available from the corresponding author upon reasonable request.

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