

# BENGKULU CITY – NATURAL DISASTER VULNERABILITY PROFILE

This profile summarises the vulnerability of the Natural, Built, Social and Cultural, and Economic environments of Bengkulu City to natural hazards. The Disaster Risk Reduction initiatives by the local government are also described.

## 2015



Vertical tsunami evacuation shelter in the Teluk Segara sub-district of Bengkulu City



# NATURAL ENVIRONMENT

Bengkulu City is the capital of Bengkulu Province, situated on the west coast of Sumatra, Indonesia. With a land area of 152 km<sup>2</sup>, the city occupies low coastal plains, small river basins, raised coastal terraces and relatively low-lying hill terrain.

## Hazards and Risks

Bengkulu City is located near the Sunda tectonic margin, and like most of Sumatra has a wet and dry season. Hence, the city is particularly prone to large earthquake, sizeable tsunami, and regular flooding. Climate change will exacerbate the already high risk related to forest fires, floods, extreme weather and drought. Bengkulu City has a BNPB Disaster Risk Index score of 170 (high) and it is ranked 168<sup>th</sup> out of 496 districts assessed (BNPB 2013).

## Natural Environment Vulnerability

Bengkulu's coastline is vulnerable to erosion and aggradation and potential loss of mangroves, a key coastal ecology for fisheries. Due to the low-lying topography, groundwater and land are susceptible to salt water contamination from tsunami inundation. River drainage patterns may change in the event of an earthquake, affecting land-use. Forest and crop cover will change with global warming. Deforestation, illegal logging and conversion of forests to palm plantations modifies catchments, increases and concentrates run-off, increases erosion and flood potential. Mining activities upstream of Bengkulu City also causes sedimentation in the rivers and exacerbates flooding.



**Table 1.** Assessment of risk from hazards for Bengkulu City (Disaster Risk Index- 2013).

Threat	Earthquake	Tsunami	Flood	Landslide	Coastal Erosion	Forest fires	Extreme weather	Drought
Risk	High	High	High	Moderate	High	High	Moderate	High

# SOCIAL AND CULTURAL ENVIRONMENTS

The population of Bengkulu City in 2013 was 334,529. The population density of Bengkulu City is about 2,280 people per km<sup>2</sup>. The population is made up of a number of ethnicities and is predominantly Muslim.

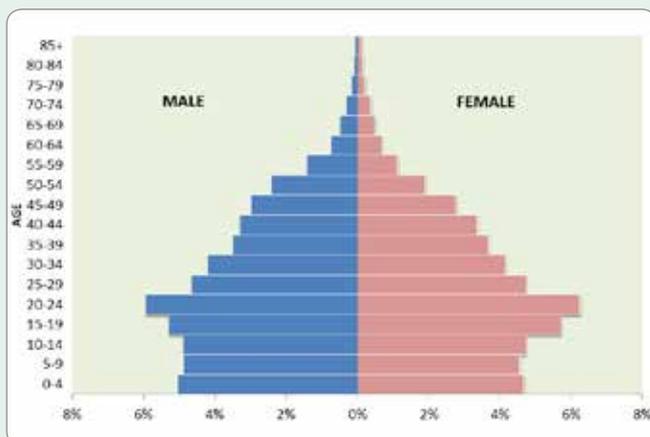
## Youthful Population

Bengkulu City has a youthful population. Younger people can be more vulnerable to disasters, but there is an opportunity to educate youth on hazards and potential impacts through schools.

The use of social media should be considered when educating children and young adults.

## Immigration

As a result of transmigration, there are some ethnic, racial, religious and social issues. The migrant population may be more vulnerable to hazards as they are often unaware of the local environment and the risk reduction measures in place. Social conflict, mainly regarding disputes over land have occurred.



## ECONOMIC ENVIRONMENT

### Vulnerable Port

Bengkulu City is predominantly a port city with much of the local commodities from the surrounding districts (palm oil, coffee, cocoa, coal) being shipped from here. The port should be a priority in terms of natural hazard mitigation.

### Vulnerable tourist industry

Tourism is primarily based along the beaches of Bengkulu, which are vulnerable to earthquake, tsunami and in the long term sea level rise and coastal erosion.

## BUILT ENVIRONMENT

### Poor construction and development control

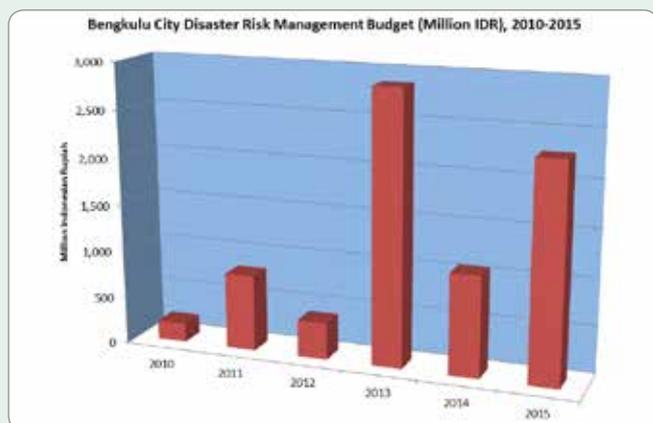
Many buildings and developments in Bengkulu City do not have permits and commonly do not adhere to spatial planning and building regulations. Land conditions, including hazards, are often not considered despite hazard/risk maps being available.

### At-risk major transport gateways

Both the port and airport are at risk from hazards, and the ports capacity is diminished by sedimentation and the need for constant dredging of the shipping channel. Disruption to the port would have significant impacts on the Provincial and City economies and contingency arrangements should be formulated.

## DISASTER RISK REDUCTION CAPABILITY

The budget for Disaster Risk Management in 2015 is 2.2 B Rupiah (USD\$158 k), mostly allocated from the national budget of BNPB.



The Budget for Disaster Risk Management is 2.2 B Rupiah (USD\$158 k), mostly allocated from the national budget of BNPB.

There is good political support for Disaster Risk Management from the District Government. The disaster management mission of Bengkulu City is “A Prosperous and Dignified Bengkulu City for the People” as laid out in the Disaster Management Plan 2014-2018 and prevention initiatives include:

- vegetation strips along parts of the coast for tsunami mitigation;
- determination of tsunami “safe zones” including an equipped vertical evacuation shelter;
- dissemination of disaster risk information through posters;
- disaster hazard maps, evacuation signs and sirens;
- disaster simulation involving all of the community; and
- reconfiguring the disaster organisation structure.

### Performance score for each category of DRR Bengkulu City, April 2015



The Local Government – Self Assessment Survey (LG-SAT) diagram (right) summarises the strengths and weaknesses of the DRR environment within Bengkulu City, April 2015.

### Coordination

While the regulations, policies and plans for DRR are in place, along with a BPBD structure, stakeholder interaction and integration across all agencies in Bengkulu City is limited, and often excludes the private sector and Universities. There is a lack of awareness from the private sector for DRR and media is seldom used to disseminate disaster-related information. A DRR Forum would help coordination and networking amongst the stakeholders.

### Resources

Suitable education materials should be developed for a variety of community groups including the disabled and those on smaller offshore islands. Staff rotation at BPBD is very high, thus it is difficult to maintain capability and continuity of effort. BPBD staff would benefit from more professional development. There is also a lack of suitable digital maps and mapping software, despite data being available.

# ABOUT StIRRRD

## STRENGTHENED INDONESIAN RESILIENCE: REDUCING RISK FROM DISASTERS



With funding support from the New Zealand Aid Programme, Universitas Gadjah Mada (UGM) is partnering with GNS Science in an Activity which supports the Indonesian Government to reduce the impacts of natural disasters through increasing the disaster risk reduction (DRR) capability of local government and local universities. The Activity assists 10 districts and associated universities to understand their DRR issues and priorities, helps develop their capability to understand and manage these issues, and then to develop

an action plan and implementation programme. A key part of this involves cementing relationships between local government and local universities who will develop teaching and research programmes in aspects of disaster risk management to support their local communities. The districts involved in the Activity will also provide peer support to each other on the learning journey. The Project is supported by the Indonesian National Agency for Disaster Mitigation (BNPB) and Kemendesa.

### Sources:

<http://www.bpbd.bengkulukota.go.id/>

BNPB, 2013. *Indeks Rawan Bencana Indonesia*. Badan Nasional Penanggulangan Bencana, 2013.

BPS 2015: *Kota Bengkulu Dalam Angka 2014 (Bengkulu in Figures 2014)*. Badan Pusat Statistik, Kota Bengkulu, 2015.

[http://bengkulukota.bps.go.id/webbeta/website/pdf\\_publicasi/Kota-Bengkulu-Dalam-Angka-2014.pdf](http://bengkulukota.bps.go.id/webbeta/website/pdf_publicasi/Kota-Bengkulu-Dalam-Angka-2014.pdf)

StIRRRD, 2014: *Summary of Bengkulu City Focus Group Discussion*, 18 November 2014

Gafoer, S., Amin, T.C. & Pardede, R. 1992. *Geology of the Bengkulu Quadrangle (0912), Sumatra (1:25000)*. Directorate General of Geology and Mineral Resources, Geological Research and Development Centre, Bandung.

## FOR MORE INFORMATION:

<http://StIRRRD.org> or

## CONTACT:



Michele Daly

Risk and Society Department  
GNS Science  
Wellington, New Zealand  
[m.daly@gns.cri.nz](mailto:m.daly@gns.cri.nz)



Dr. Teuku Faisal Fathani

Department of Civil and  
Environmental Engineering  
Gadjah Mada University  
Yogyakarta, Indonesia  
[tfathani@ugm.ac.id](mailto:tfathani@ugm.ac.id)



Phil Glassey

Senior Disaster Risk Reduction  
Scientist  
GNS Science  
Dunedin, New Zealand  
[p.glassey@gns.cri.nz](mailto:p.glassey@gns.cri.nz)



Dr Wahyu Wilopo

Department of Civil and  
Environmental Engineering  
Gadjah Mada University  
Yogyakarta, Indonesia  
[wwilopo@ugm.ac.id](mailto:wwilopo@ugm.ac.id)



NEW ZEALAND  
MINISTRY OF FOREIGN AFFAIRS & TRADE  
Aid Programme

