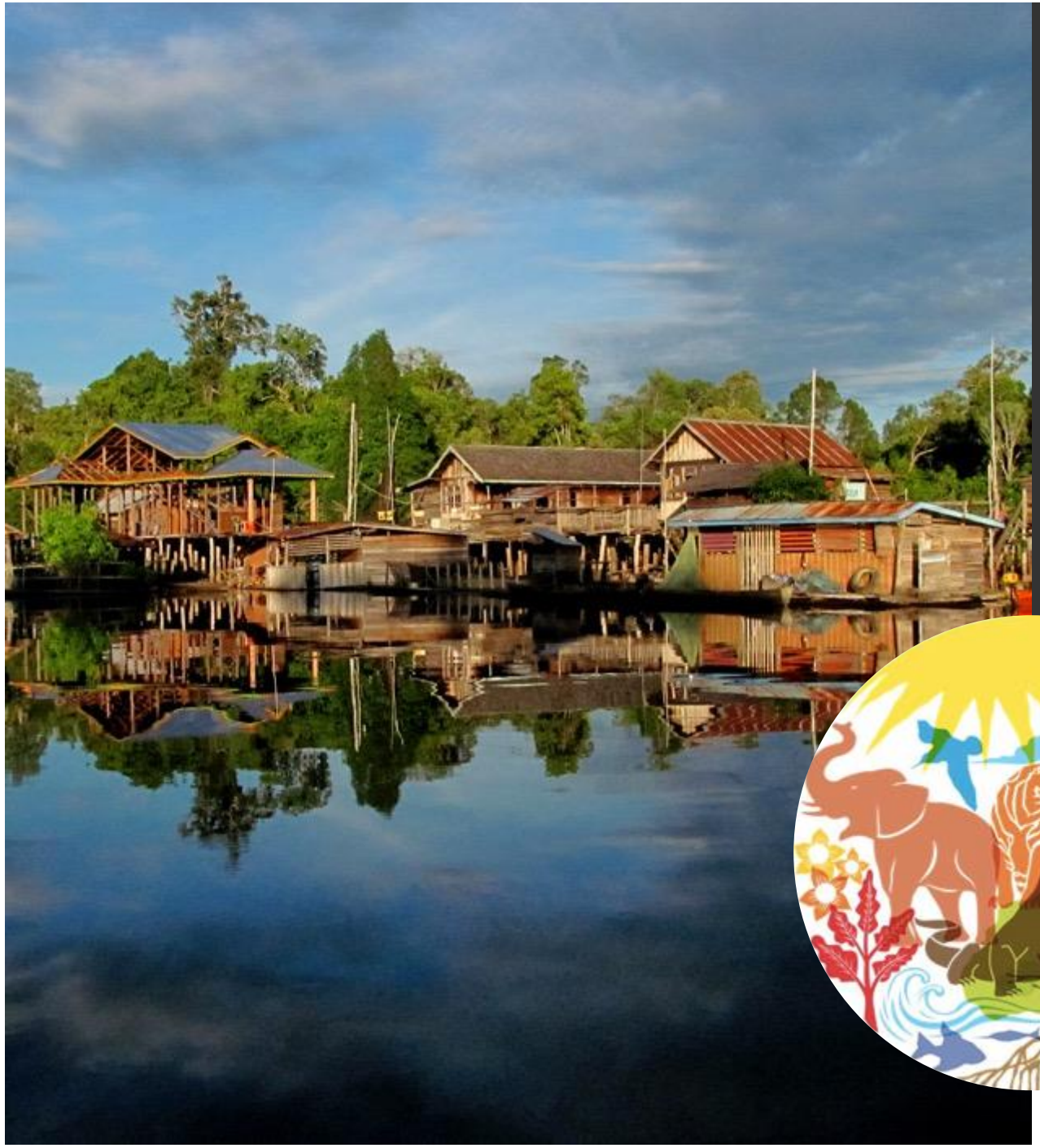
MAB-UNESCO Indonesia Program: National Biosphere Reserves Network

Y. Purwanto & Hari Nugroho
Indonesia MAB National Committee
National Research and Innovation Agency (BRIN)



Man and the Biosphere Program

MAN AND THE BIOSPHERE (MAB) PROGRAM

The MAB programme is **an intergovernmental scientific programme that aims to establish a scientific basis for enhancing the relationship between people and their environments**. It combines the natural and social sciences with a view to **improving human livelihoods and safeguarding natural and managed ecosystems, thus promoting innovative approaches to economic development that are socially and culturally appropriate and environmentally sustainable**.

VISION is a world where people are conscious of their common future and their interactions with the planet, and act collectively and responsibly to build thriving societies in harmony within the biosphere. The MAB programme and its World Network of Biosphere Reserves (WNBR) serve this vision through biosphere reserves and beyond

MISSION 2015–2025:

- Develop and strengthen models of sustainable development through the WNBR;
- Communicate experiences and lessons learned, and facilitate the global diffusion and application of these models;
- Support evaluation and high-quality management of biosphere reserves, strategies and policies for sustainable development and planning, and accountable and resilient institutions;
- Help Member States and stakeholders to achieve the Sustainable Development Goals by sharing experiences and lessons learned related to exploring and testing policies, technologies and innovations for the sustainable management of biodiversity and natural resources and mitigation and adaptation to climate change.

INDONESIA MAB-UNESCO NATIONAL COMMITTEE, BRIN

➢ **BRIN as the NATIONAL FOCAL POINT of the MAB-UNESCO program in Indonesia has a mission to ensure a harmonious balance between humans, nature and the environment**

Indonesia MAB-UNESCO National Committee
(Decree of BRIN Chairman No. 23/HK/2022)

- Develop MAB Program policies in Indonesia
- Directing and fostering the activities of the MAB program in Indonesia
- Establish network for the development of the MAB program in Indonesia
- Representing Indonesia in MAB- UNESCO Program activities and international forums

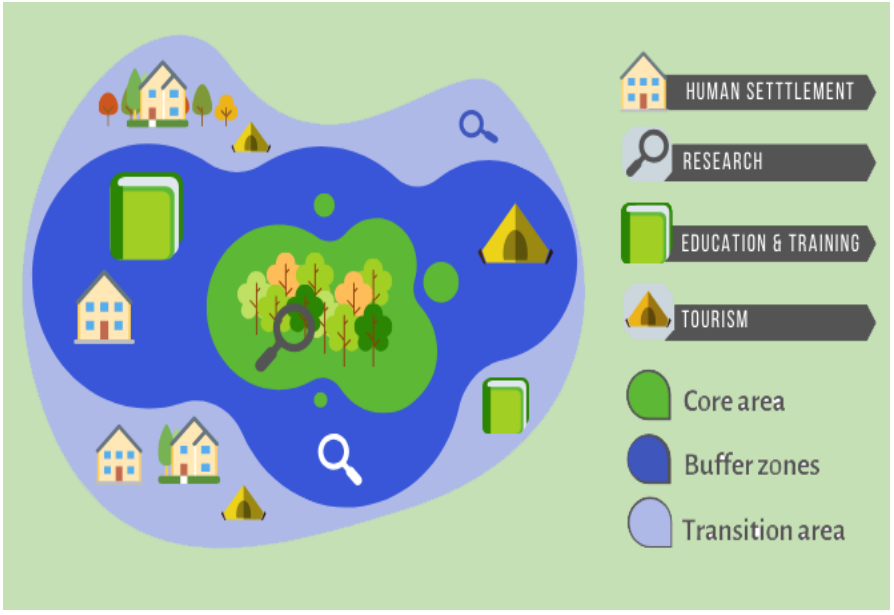
Indonesia MAB-UNESCO Nat. Comm.→
Carry out missions, programs and activities of MAB in Indonesia, especially related to the development of BIOSPHERE RESERVES as a means for Sustainable Area Development

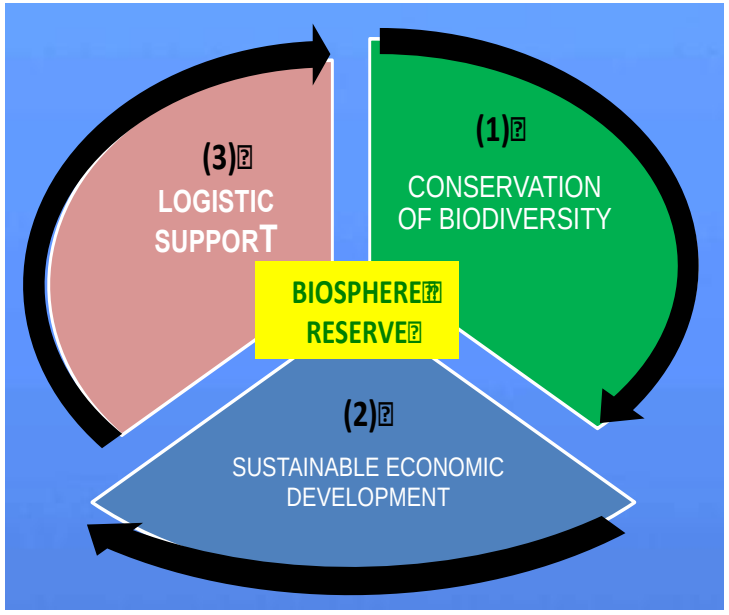
unesco
Indonesian MAB Programme National Committee

WHAT IS A BIOSPHERE RESERVE ?

- **The biosphere reserve is a concept of site management to harmonize the needs for biodiversity conservation, socio-economic development & logistic support**
- **The concept created by the UNESCO Man and the Biosphere Program in order to promote a balanced relationship between human and the nature**

Biosphere reserves are '**learning places for sustainable development**'. They are sites for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity. They are places that provide local solutions to global challenges. Biosphere reserves include terrestrial, marine and coastal ecosystems. Each site promotes solutions reconciling the **conservation of biodiversity with its sustainable use**.





Core Areas

It comprises a strictly protected zone that contributes to the conservation of landscapes, ecosystems, species and genetic variation

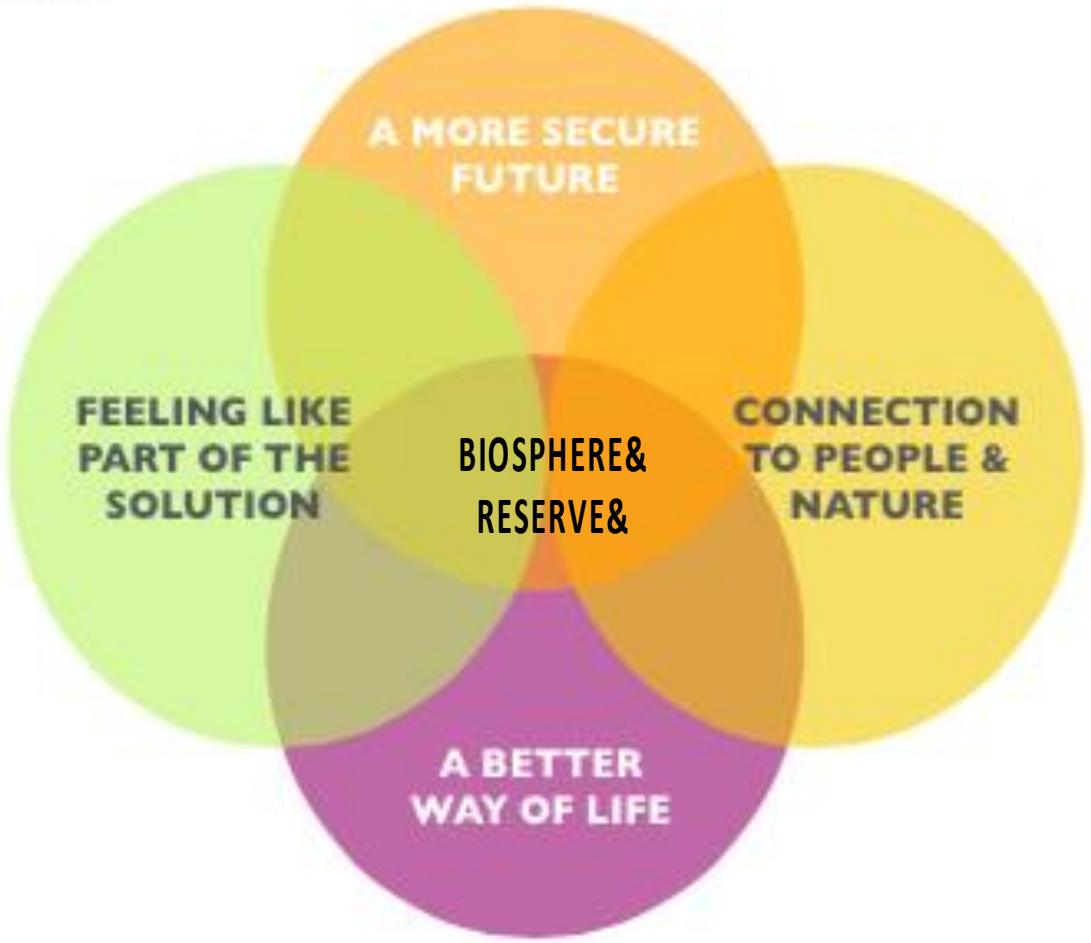
Buffer Zones

It surrounds or adjoins the core area(s), and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.

Transition Area

The transition area is where communities foster socio-culturally and ecologically sustainable economic and human activities.

ACHIEVEMENT IN DEVELOPING A BIOSPHERE RESERVE



BR's role is to use the power of science and the richness of biodiversity and culture to inspire sustainable change

Our impact is creating a secure future that we can look forward

Inspire a positive future by connecting people and nature today

Our network serves to reconnect people and economies with their environment → *Balance*

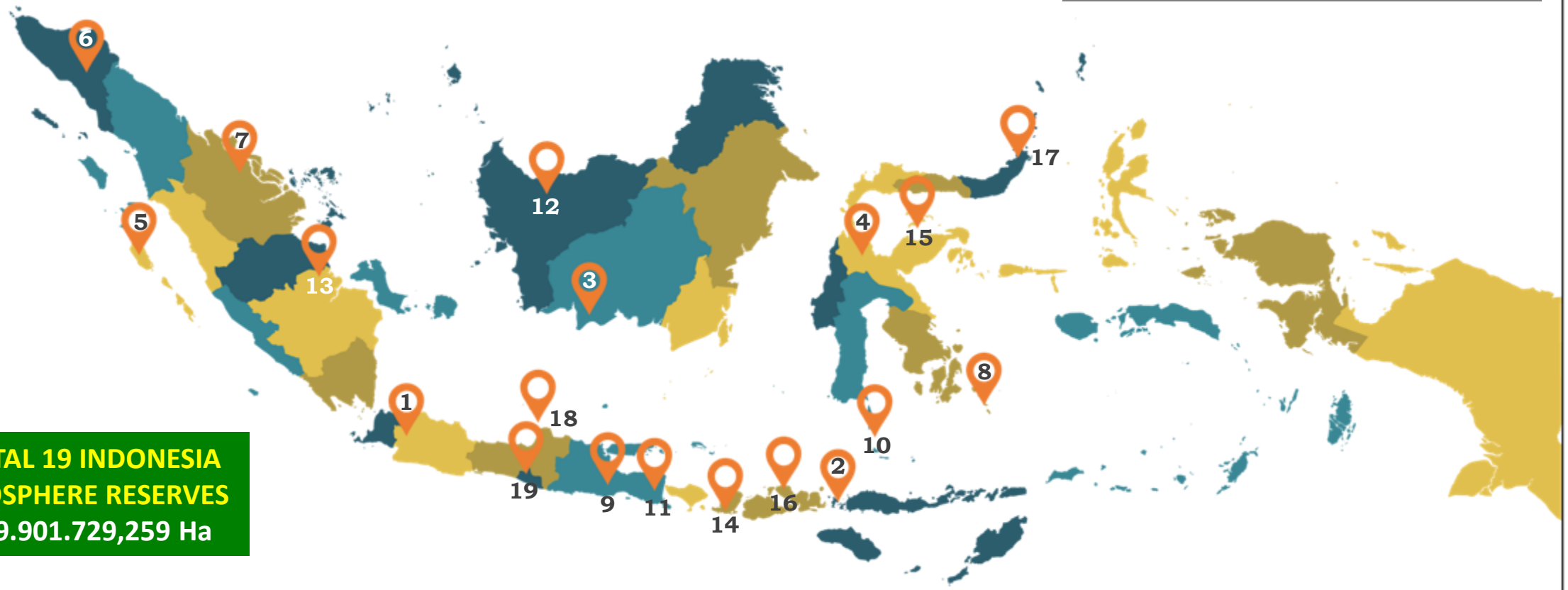
We make the future real and there is continuous improvement

Indonesian MAB Programme National Committee

MAB (2016)

19 Indonesian Biosphere Reserves

738 Biosphere Reserves
134 Countries



TOTAL 19 INDONESIA BIOSPHERE RESERVES = 29.901.729,259 Ha

CORE AREA = 5.362.516,74 Ha **BUFFER ZONE = 7.618.547,845 Ha** **TRANSITION AREA = 16.875.935,375 Ha**

1. Cibodas
2. Komodo
3. Tanjung Puting
4. Lore Lindu
5. Siberut
6. Gunung Leuser
7. Giam Siak Kecil-Bukit Batu
8. Wakatobi
9. Bromo Tengger Semeru-Arjuno
10. Takabonerate-Kepulauan Selayar
11. Belambangan
12. Betung Kerihun Danau Sentarum-Kapuas Hulu
13. Berbak-Sembilang
14. Rinjani-Lombok
15. Togean Tojo Una-Una
16. SAMOTA
17. Bunaken Tangkokok
18. Karimunjawa Jepara Muria
19. Merapi Merbabu Menoreh

unesco
Indonesian MAB Programme National Committee

BENEFITS of BIOSPHERE RESERVE

- Recognition of the excellence of natural resources, ecosystems and culture
- Recognition
- Trust/Credibility
- International status

VALUE and OPPORTUNITY

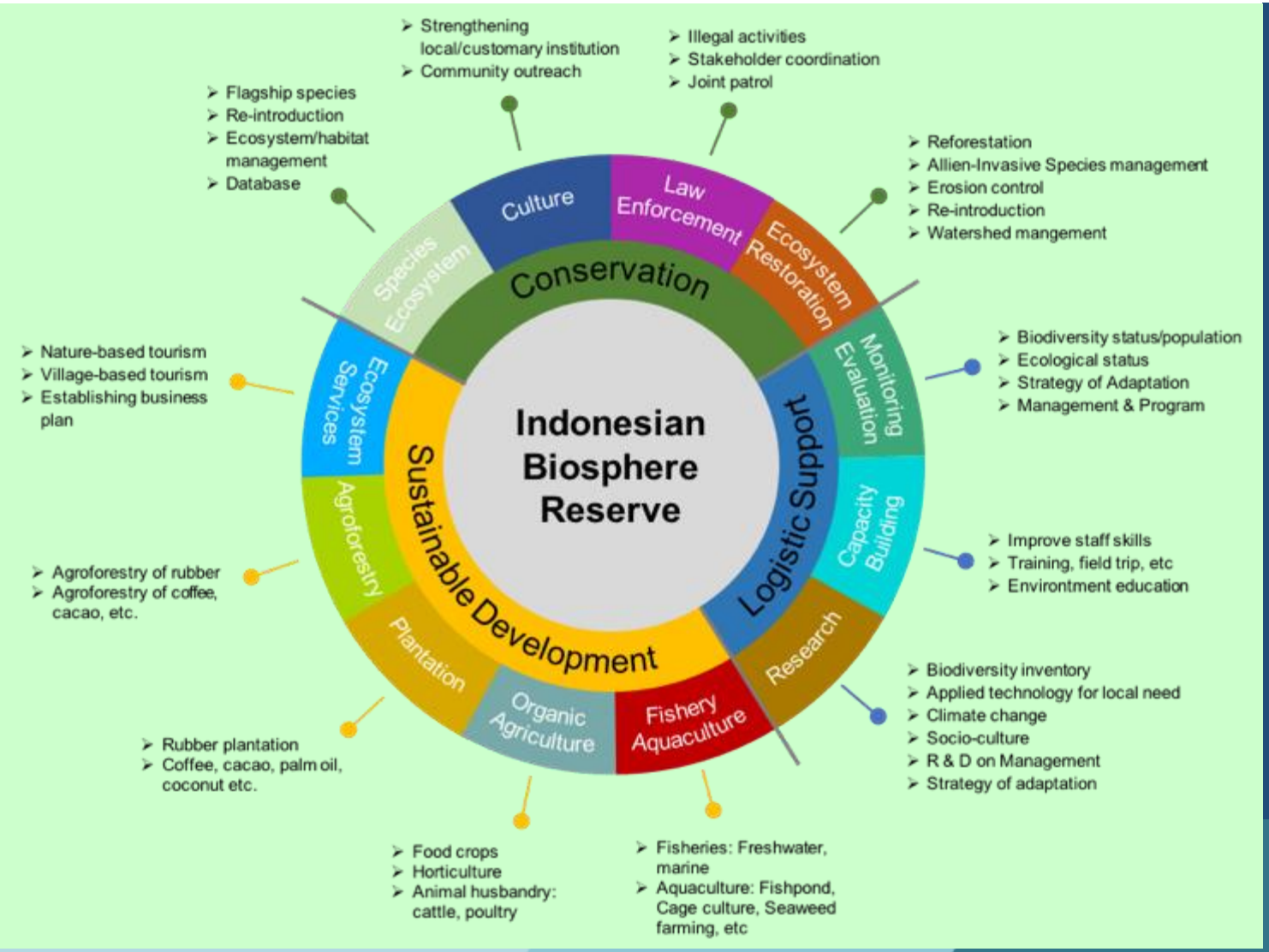
- Conservation of Biodiversity and Culture
- NETWORKING: SeaBRnet, WNBR
- SCIENCE-INNOVATION, Capacity Building
- Development of BR Product sustainably
- Development of Sustainable Economy
- ***BRANDING***

BENEFIT

WHO WOULD BENEFITS?

1. Communities in and around the BR → Ecosystem services, production activities, and cultural preservation
2. Conservation Areas → Conservation of Natural Resources and Ecosystems
3. Development of science and technology → Natural laboratory
4. Government (Local and Central Government): sustainable economic development, socio-cultural values and government image
5. Private Sectors → commodity value
6. Indonesia: (a) world recognition of natural and cultural wealth; (b) safeguard of conservation areas; (c) NETWORKING; and (d) human resource development, communication, coordination, collaboration, exchange of knowledge and experience through the World Network of Biosphere Reserves.

DEVELOPMENT APPROACHES



1. **Landscape Ecosystem Approach**
2. **Legal aspects and strong institutions**
3. **Multi-Party Role**
4. **Partnership**
5. **Local Community Engagement**
6. **Science, Technology and Innovation**
7. **Continuous improvement (continuous improvement)**
8. **Branding Development and Green economy**
9. **Sustainability Action**

@purwanto (2015)

Networking of MAB - UNESCO Program

Indonesian MAB Programme National Committee

Global

World Network of Biosphere Reserve: 714 CB; 129 Negara

- AfriMAB
- Ibero-American MAB Network (IberoMAB)
- EuroMAB
- ArabMAB
- East Atlantic Biosphere Reserve Network (REDBIOS)

Ecosystem-specific networks: Mountains; World Network of Island and Coastal Biosphere Reserves; Tropical forests; Drylands; Urban areas; Savannahs; Agro-ecosystems

World Heritage Sites; Global Geopark Network

IPBES; CITES; IUCN; IAPA; RAMSAR Site

University; Research Agency; NGOs

Regional

- East Asian Biosphere Reserve Network (EABRN)
- Pacific Biosphere Reserve Network (PacMAB)
- South and Central Asia MAB Network (SACAM)
- Southeast Asian Biosphere Reserve Network (SeaBRnet)

ASEAN Heritage Park (AHP)

University; Research Agency; NGOs

National

UNESCO National Focal Point: IHP, IOC, MoW, MoST, Geopark, World Heritage

University; Research Agency; NGOs

UNESCO PLATFORM

MAB Indonesia (Biosphere Reserve)

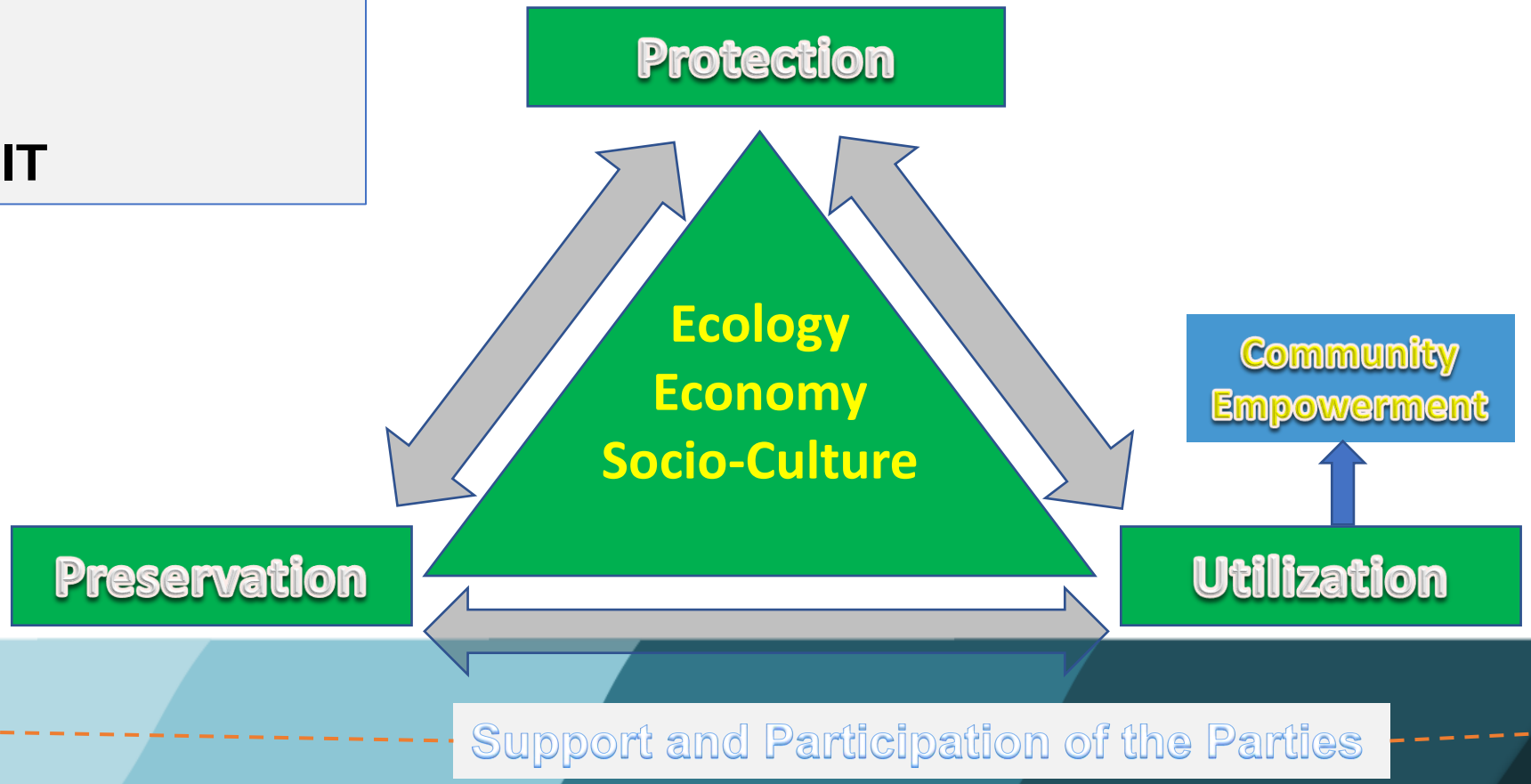
OTHER PLATFORM

MANAGEMENT OF INDONESIAN BIOSPHERE RESERVE

The Law on Conservation of Biological Natural Resources and Ecosystems of the Republic of Indonesia: No. 5/1990

WHAT WE HAVE TO DO?

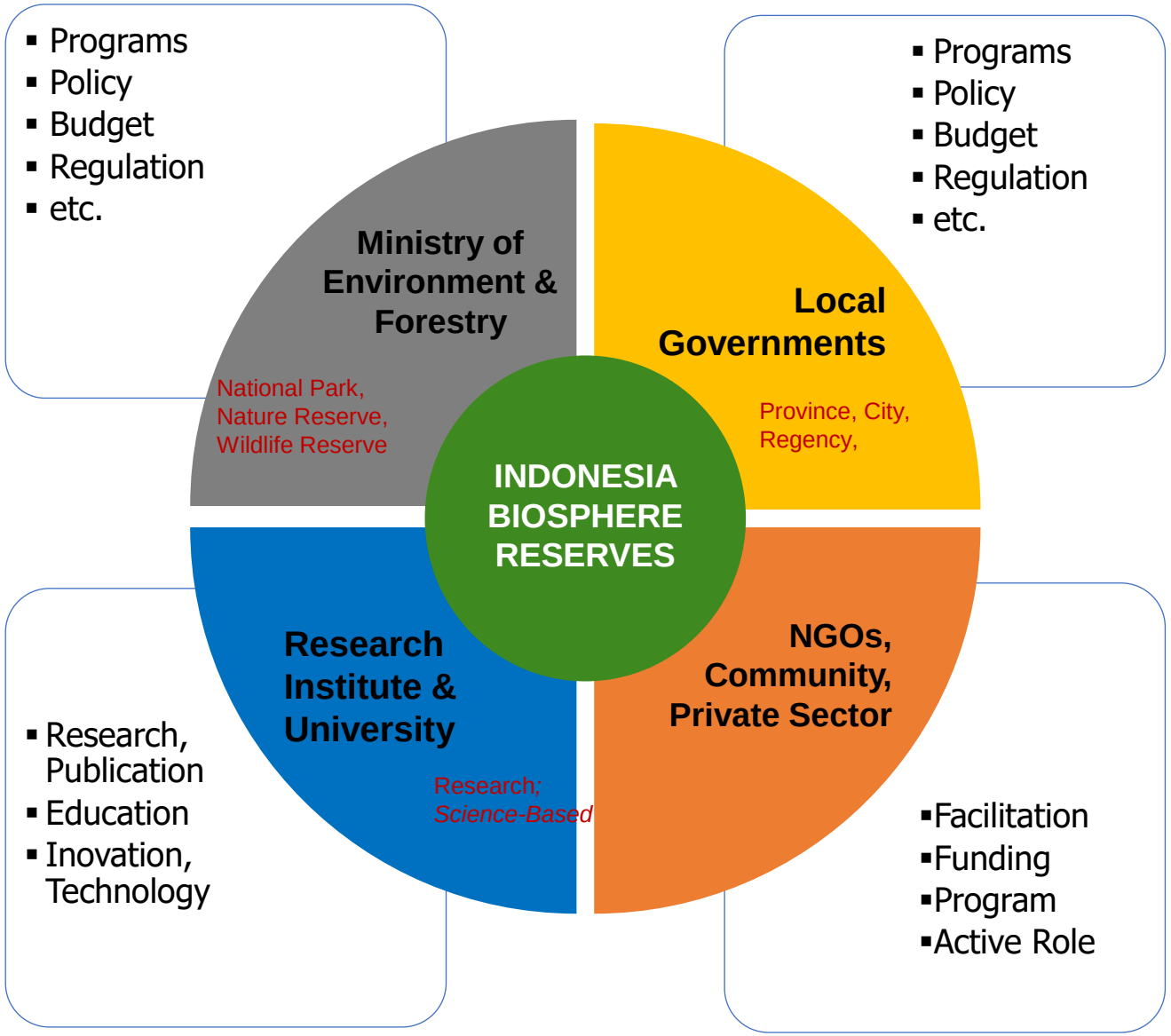
1. SAVE IT
2. STUDY IT
3. USE IT
4. DEVELOP IT



Indonesian MAB Programme National Committee

@Prananjaya (2020); @purwanto (2022)

PARTNERSHIP for INDONESIAN BRs MANAGEMENT



(MAB Indonesia, 2016)

Precondition for Area Management Partnership:

Application of ***Triple Mutualities*** **(3 M)**

1. Mutual Respect

2. Mutual Trust

3. Mutual Benefit

CHALLENGES

A. Human Activities

1. The level of dependence of the Indonesian BRs (Island, Coastal and Marine) communities is very high on natural resources (flora, fauna. coral reefs, reef fish and other living things) which can cause over harvesting.
2. Illegal activities, and destructive natural resources and ecosystem which can cause loss of habitat and biodiversity
3. Illegal exploitation: mining, logging, fishing, hunting, etc.
4. Conflicts over the use of areas (land and seas)
5. Island and Marine litter

B. Policies and Investation

1. Lack of policies support
2. Low investment

Economy / Community livelihood

The Main Problem and Solution of the Coastal and Marine Area Management

No	Aspects	Problems	Solution
1.	**Social**	(1) Marine debris; (2) Destructive uses of fisheries; and (3) Cruise	(1) Public and tourist awareness about the danger of marine debris; (2) Confirmation of fishing arrangements; and (3) Coordination of shipping line
2.	**Institution**	(1) Lack of coordination between institution; (2) Implementation of the zoning system; and (3) Management budget is limited	(1) Public awareness about sustainable use; (2) Improved partnership and coordination on between stakeholders; and (3) Increased Management Budget
3.	**Economic**	(1) Tourist levy; (2) Instability of the selling price of fisheries products; (3) Not yet optimal economic development	(1) Increasing the role of fish auction; (2) Improving the quality of communication and coordination; and (3) Clear and integrated regulating making
4.	**Ecological**	(1) Decreasing the number of endemic species; (2) Lack of carrying capacity management base; and (3) Ecosystem degradation	Improvement of ecosystem function; (b) Endemic breeding species; and (c) Potential species breeding species
5.	**Policy**	(1) Lack of policy base on science, technology and innovation; (2) Overlapping policy; and (3) Unfair policy, etc.	(1) Policy and action based on scientific, technology and innovation; (2) Development program based on need assessment, best practices and innovation discovery; etc.

Disaster Risk in the Biosphere Reserve Areas

Photos: BNPB, 2016

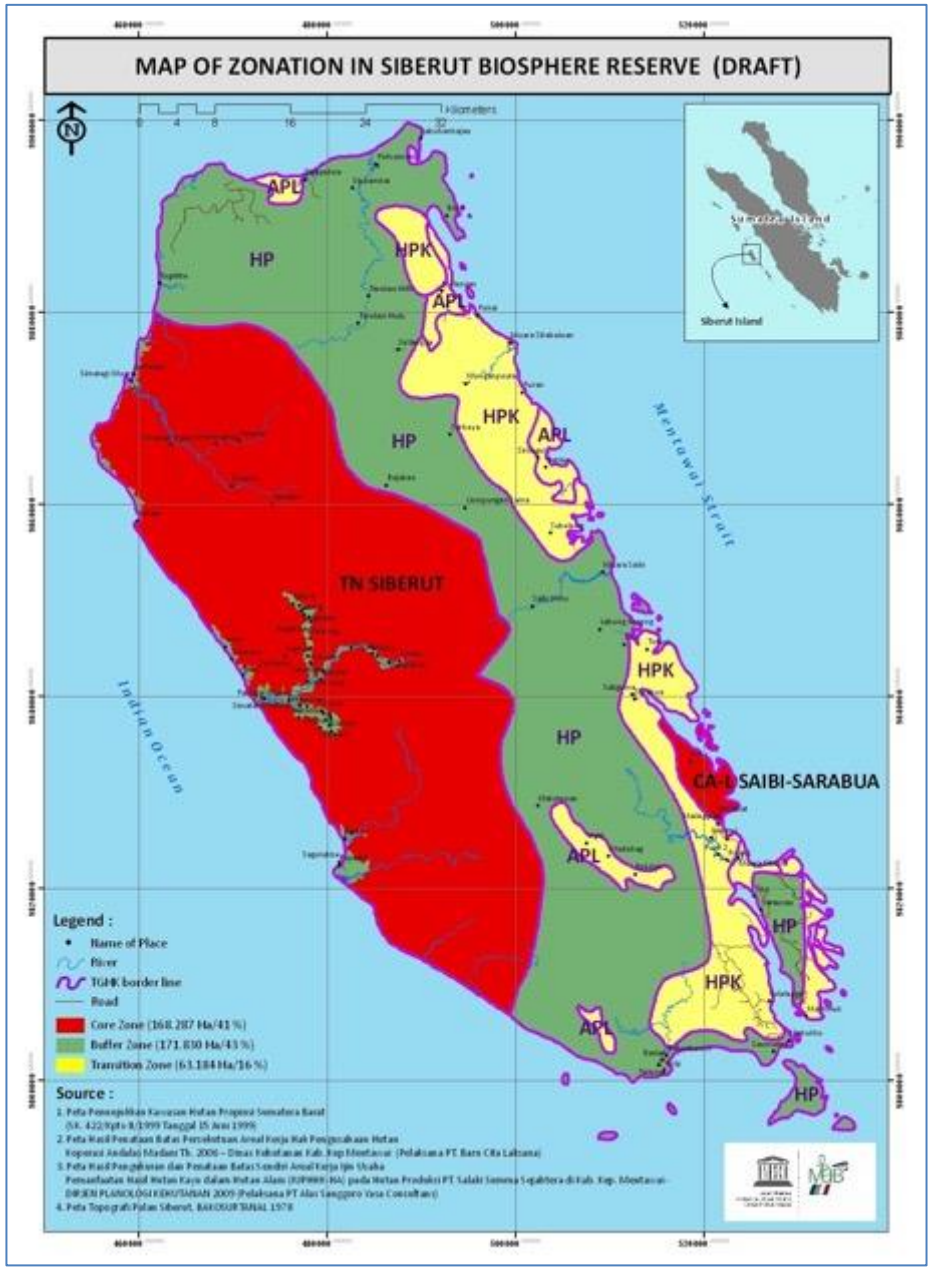
THE 12 INDONESIAN MARINE AND COASTAL BIOSPHERE RESERVES

1. Siberut Island BR
2. Berbak-Sembilang BR
3. Karimunjawa Jepara Muria BR
4. Belambangan BR
5. Rinjani Lombok BR
6. Takabonerate-Kepulaun Selayar BR
7. Samota BR
8. Togean Tojo Una Una BR
9. Wakatobi BR
10. Bunaken Tangkoko Minahasa BR
11. Komodo BR
12. Tanjung Puting BR

unesco
Indonesian MAB Programme National Committee

Damage to small islands, coastal and marine areas can pose a risk of disaster in the area including loss of habitat and biodiversity, cultural, economic and natural resources, etc.

Siberut BR



Ditetapkan: 1981
Kelembagaan: -

Ecosystem-based Network: Marine, Island and Coastal area and Mangrove

Luas Kawasan:

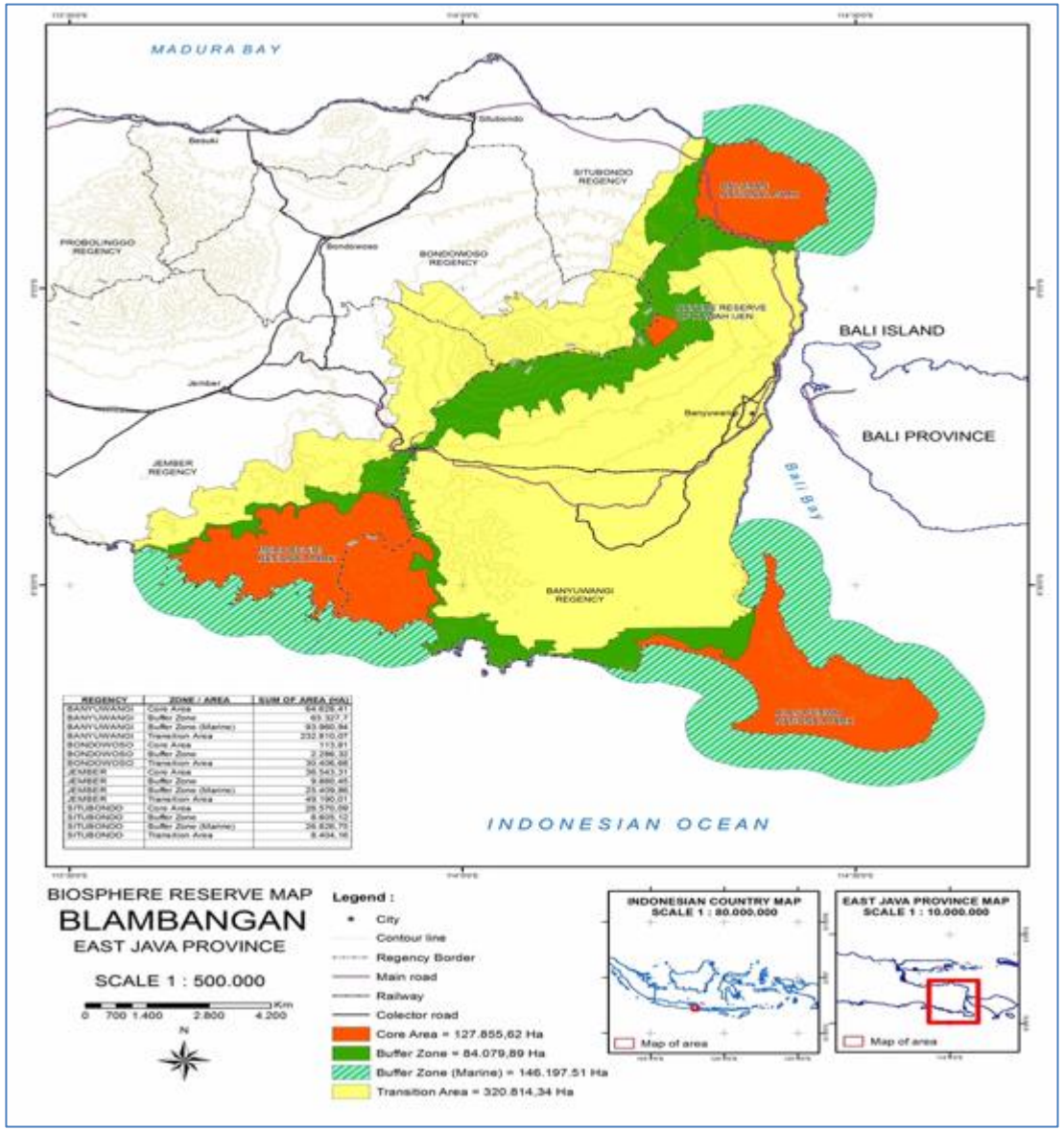
NO.	ZONASI	LUAS (ha)	(%)
1.	Area Inti	168.287	42%
2.	Zona Penyangga	171.830	43%
3.	Area Transisi	63.184	15%
TOTAL		**403.301**	**100%**

Stakeholder:

- Taman Nasional Siberut
- BKSDA Sumatera Barat
- Kabupaten Kepulauan Mentawai
- Provinsi Sumatera Barat

- Keanekaragaman hayati yang khas dan keunikan budaya masyarakat Mentawai.
- Terletak di *Ring of Fire*, rentan terhadap bencana & perubahan iklim.

Belambangan BR



Ditetapkan: 2016

Kelembagaan: Forum Koordinasi

Ecosystem-based Network: Mountain, Tropical Rainforests, Marine, Coastal and Island Areas

Luas Kawasan:

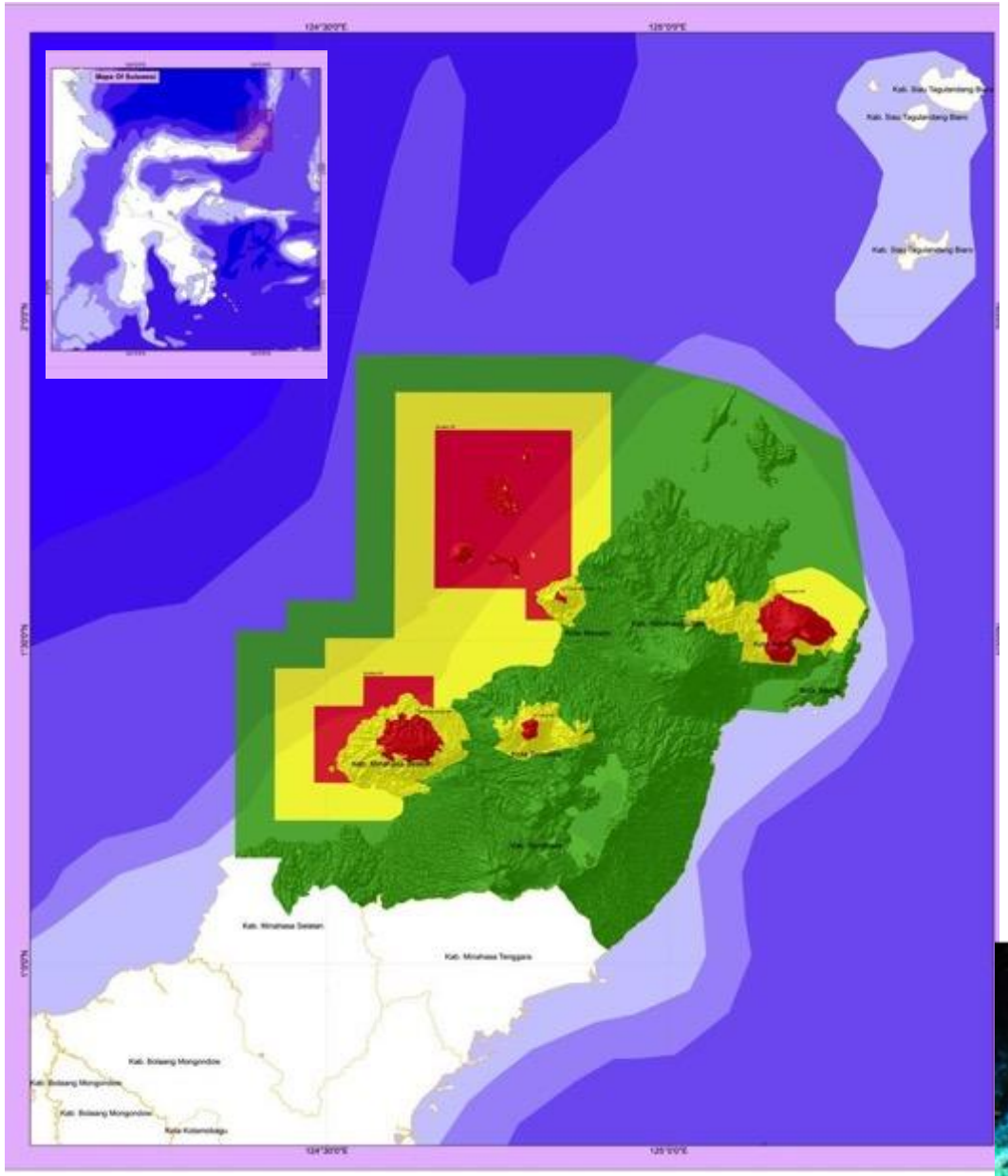
NO.	ZONASI	LUAS (ha)	(%)
1.	Area Inti	127.855,62	16%
2.	Zona Penyangga	230.277,43	30%
3.	Area Transisi	320.514,34	54%
TOTAL		778.647,39	**100%**

Stakeholder:

- Taman Nasional Alas Purwo
- Taman Nasional Baluran
- Taman Nasional Merubetiri
- BKSDA Jawa Timur
- Provinsi Jawa Timur
- Kab. Banyuwangi
- Kab. Situbondo
- Kab. Bondowoso
- Kab. Jember




Bunaken Tangkoko Minahasa BR



Ditetapkan: 2020

Kelembagaan:
Forum Koordinasi

Ecosystem-based Network:
Tropical Rainforests, Marine, Coastal and Island Areas

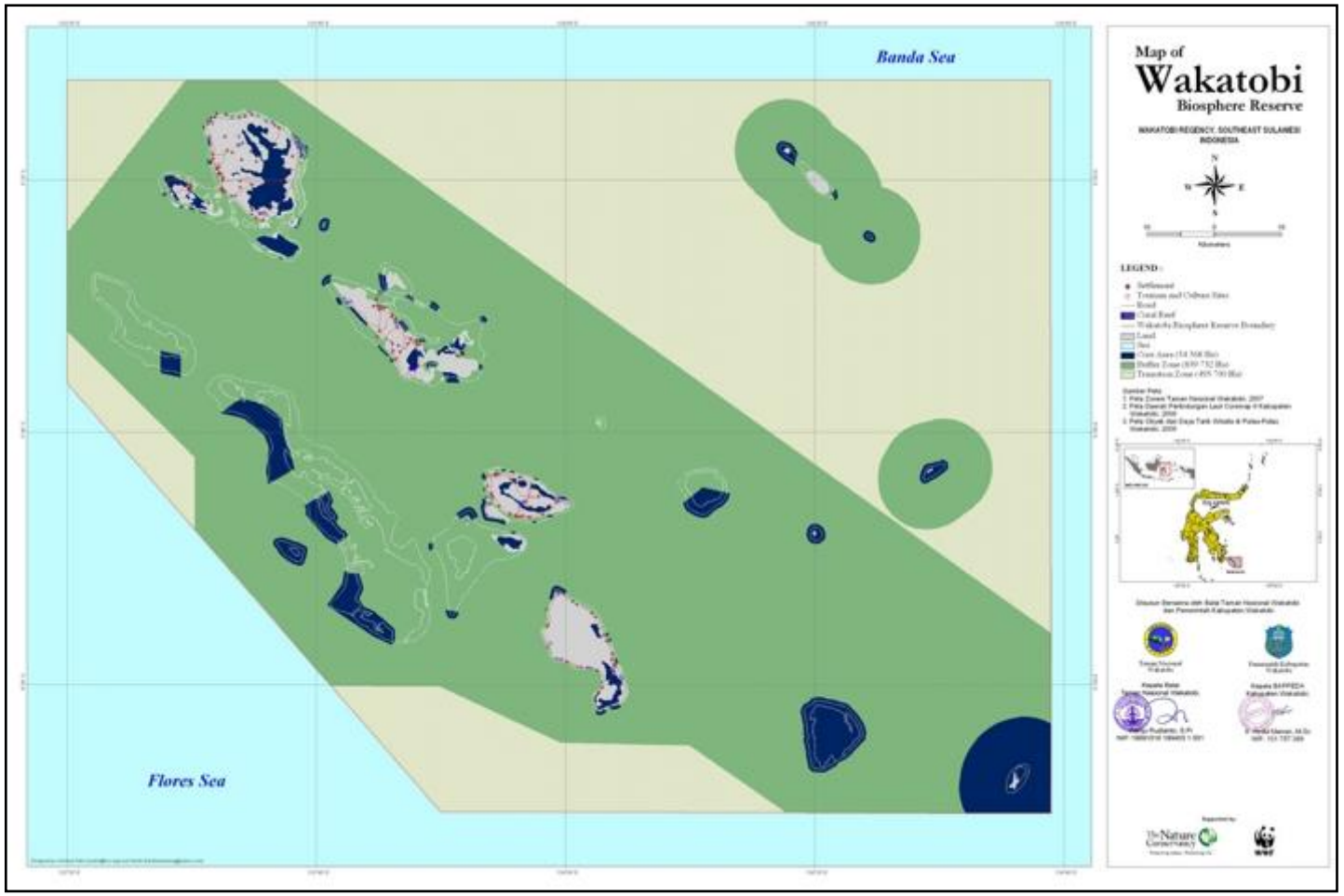
Luas Kawasan:

NO.	ZONASI	LUAS (ha)	(%)
1.	Area Inti	89.686,730	12%
2.	Zona Penyangga	182.539,905	24%
3.	Area Transisi	474.169,285	64%
TOTAL		746.405,920	**100%**

Stakeholder:

- Taman Nasional Bunaken
- BKSDA Sulawesi Utara
- Provinsi Sulawesi Utara
- Kab. Minahasa
- Kab. Minahasa Selatan
- Kab. Minahasa Utara
- Kota Manado
- Kota Bitung
- Kota Tomohon

Wakatobi BR



Luas Kawasan:

NO.	ZONASI	LUAS (ha)	(%)
1.	Area Inti	54.568	4%
2.	Zona Penyangga	839.732	60%
3.	Area Transisi	495.700	36%
TOTAL		1.390.000	**100%**

Stakeholder:

- Taman Nasional Wakatobi
- Kab. Wakatobi
- Masyarakat Adat Wakatobi

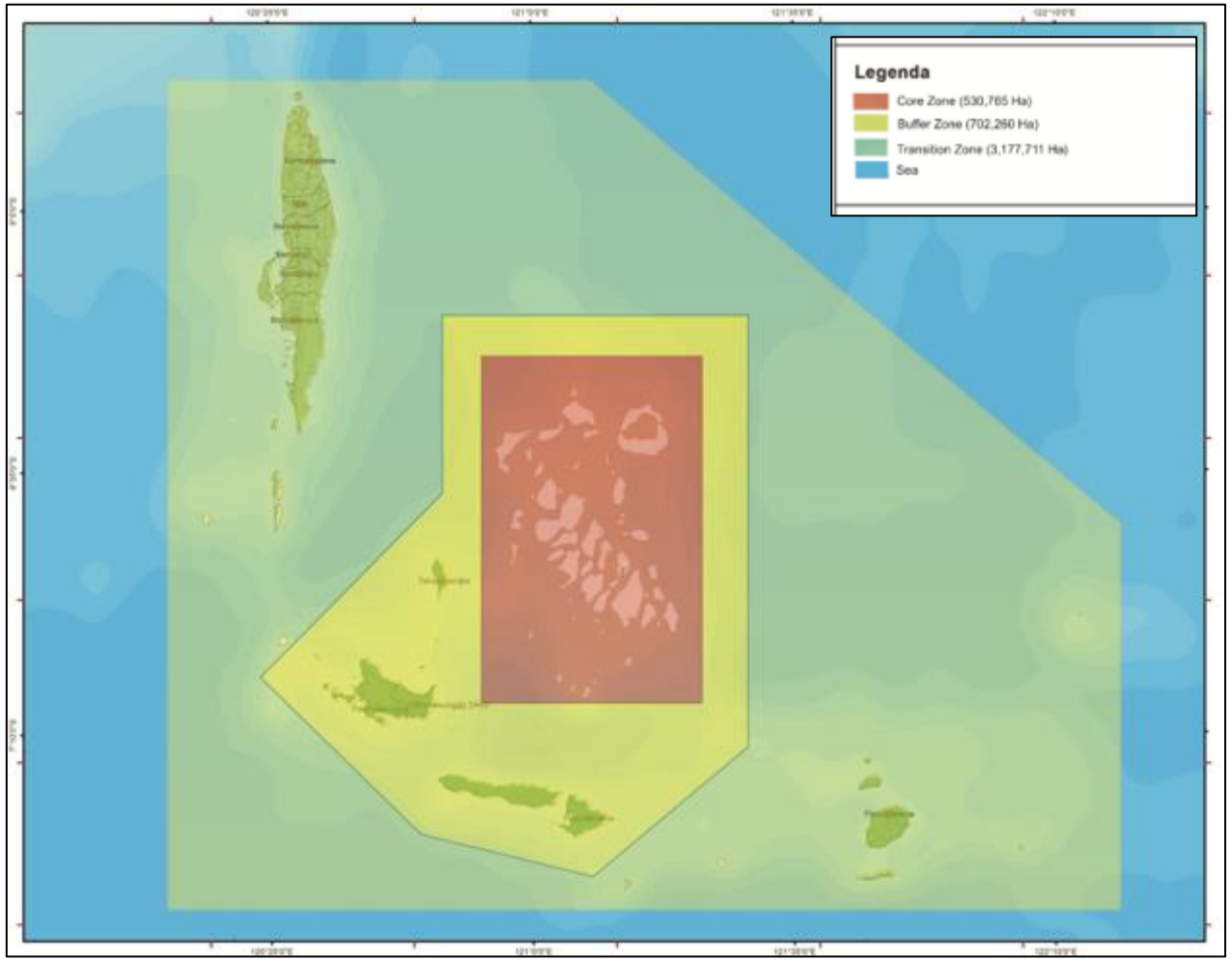
- Luas kawasan TN Wakatobi = Kab. Wakatobi.
- Perlu kesepakatan stakeholder dalam pengelolaan kawasan ini.
- 10 Destinasi Wisata Prioritas Nasional.

Ditetapkan: 2012

Kelembagaan:
Forum Koordinasi

Ecosystem-based Network:
Marine, Coastal and Island Areas

Takabonerate-Kepulauan Selayar BR



Luas Kawasan:

NO.	ZONASI	LUAS (ha)	(%)
1.	Area Inti	530.765	12%
2.	Zona Penyangga	702.760	16%
3.	Area Transisi	3.177.711	72%
TOTAL		4.410.736	**100%**

Stakeholder:

- Taman Nasional Takabonerate
- Kab. Kepulauan Selayar

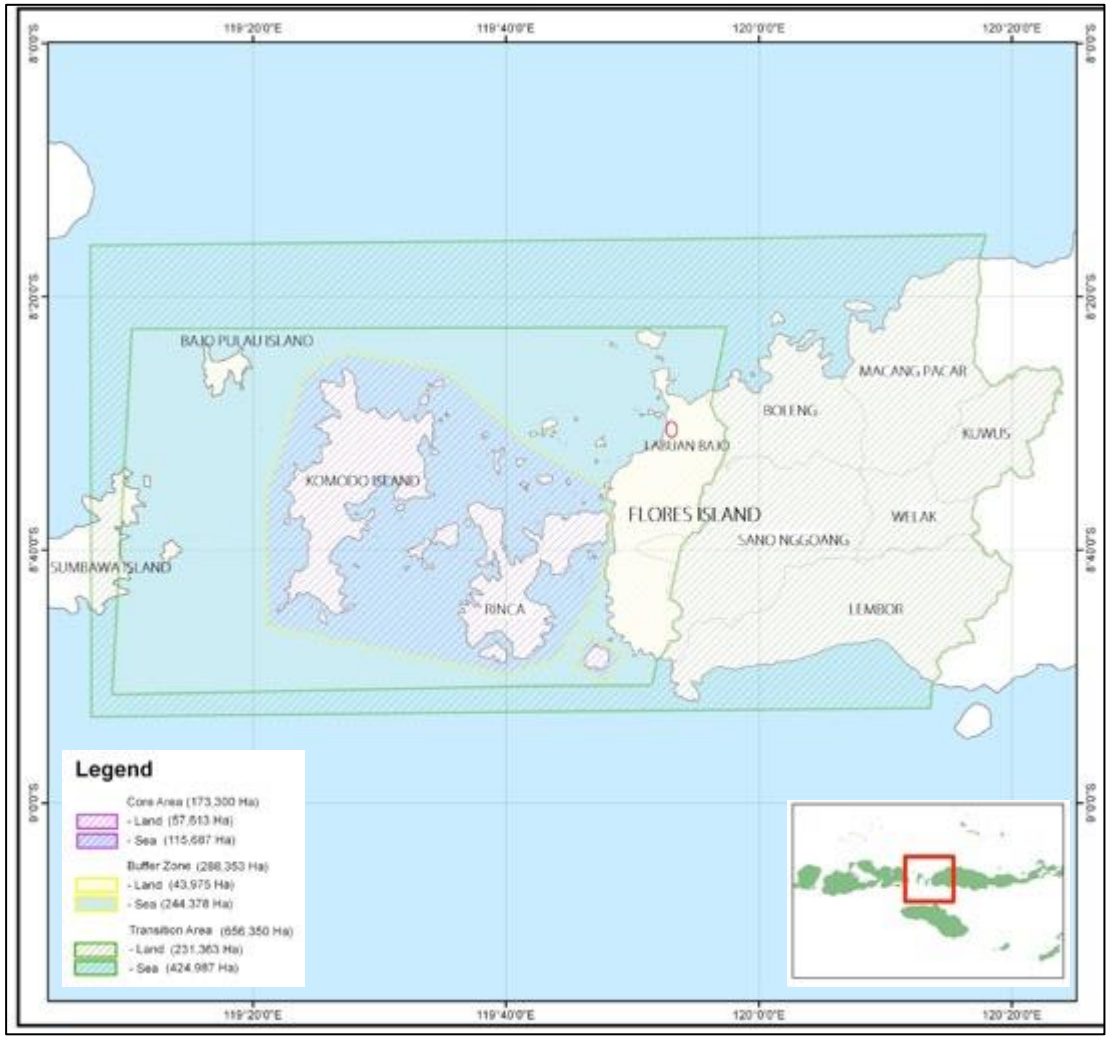
- Atol terbesar di Asia Tenggara dan terumbu karang atol terbesar ketiga di dunia.
- Ancaman dan tekanan: pertumbuhan penduduk, eksploitasi alam yang merusak, bencana, perubahan iklim.

Ditetapkan: 2015

Kelembagaan:
Forum Koordinasi

Ecosystem-based Network:
Marine, Coastal and Island Areas

Komodo BR



Ditetapkan: 1977

Kelembagaan:
Forum Koordinasi

Ecosystem-based Network:
Tropical Humid Forests, Marine, Coastal & Island Areas

Luas Kawasan:

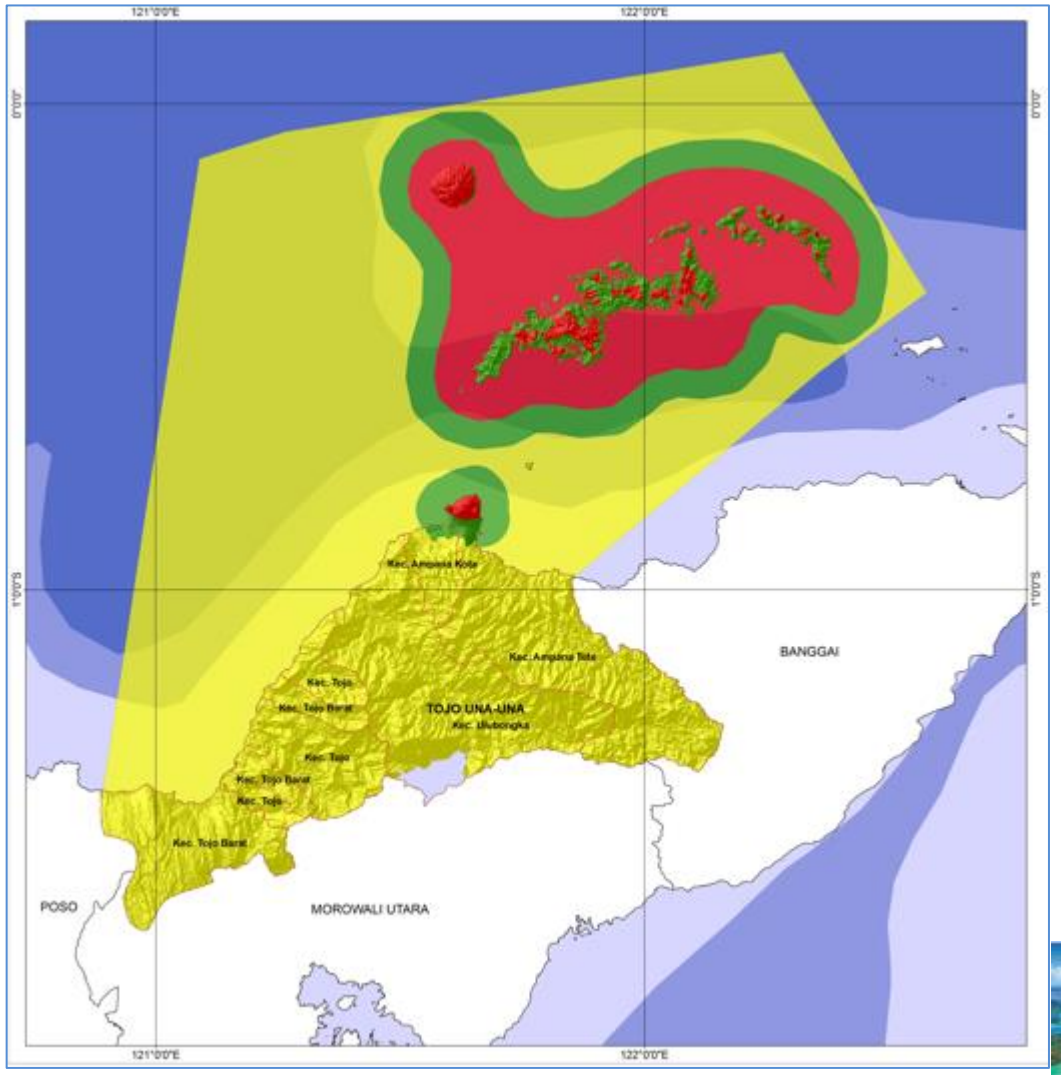
NO.	ZONASI	LUAS (ha)	(%)
1.	Area Inti	73.300	7%
2.	Zona Penyangga	288.353	26%
3.	Area Transisi	656.350	67%
TOTAL		1.118.003	**100%**

Stakeholder:

- Taman Nasional Komodo
- Kab. Manggarai Barat
- Badan Otorita Pariwisata Labuan Bajo Flores

- Habitat flora/fauna endemik: Komodo (*Varanus komodoensis*), terumbu karang, dll.
- Perlu kesepakatan stakeholder dalam pengelolaan kawasan ini → Konflik kepentingan.
- Destinasi Super Prioritas.

Togean Tojo Una-Una BR



Ditetapkan: 2019

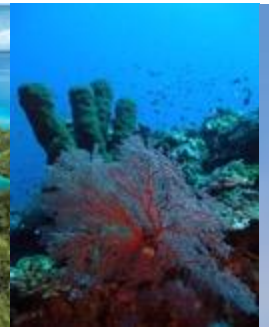
Kelembagaan:
Forum Koordinasi

Stakeholder:
- Taman Nasional Kepulauan Togean
- Kab. Tojo Una-Una

Luas Kawasan:

NO.	ZONASI	LUAS (ha)	(%)
1.	Area Inti	368.463,7	17%
2.	Zona Penyangga	281.135,8	13%
3.	Area Transisi	1.538.032	60%
TOTAL		2.187.631,5	**100%**

- Ekosistem pulau-pulau kecil: ekosistem pesisir, ekosistem mangrove, dan ekosistem laut.
- Ancaman dan tekanan: pertumbuhan penduduk, eksploitasi alam yang merusak, degradasi lingkungan.



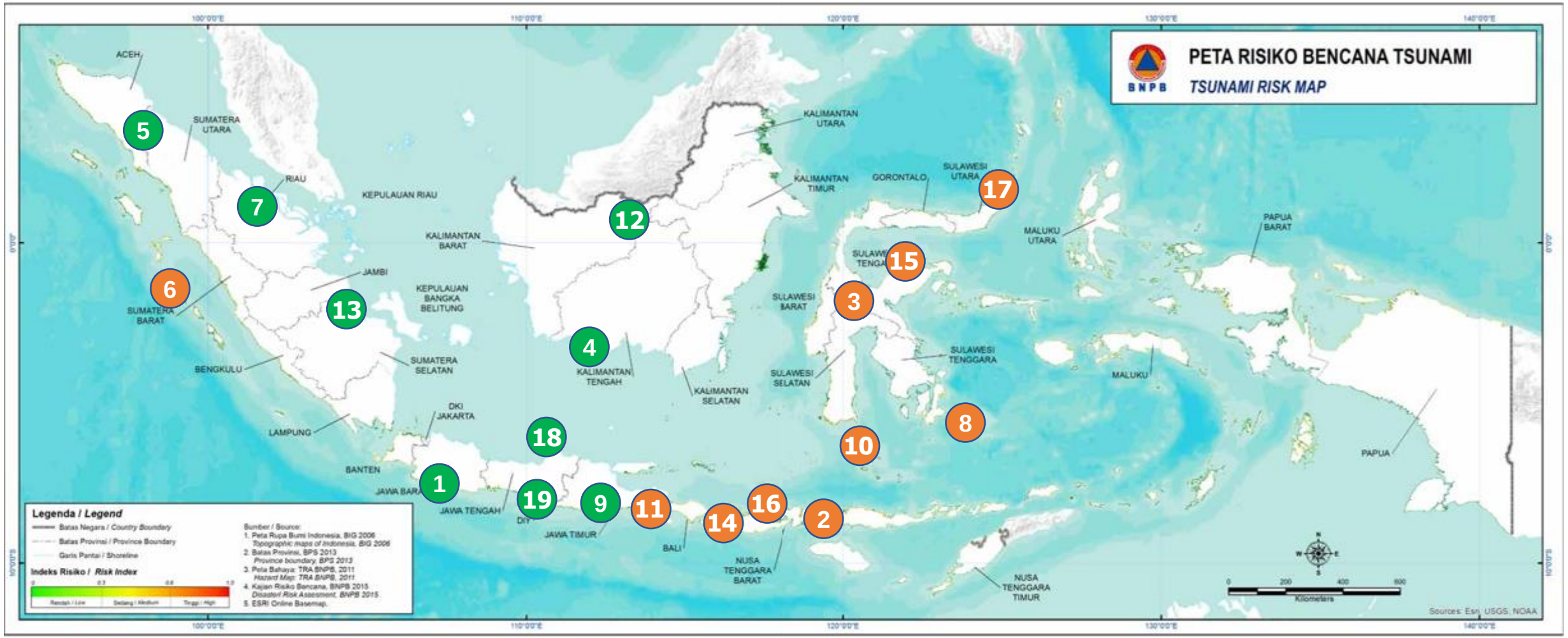
Ecosystem-based Network:
Marine, Coastal and Island Areas

Low – risk of earthquake

1. Cibodas BR
2. Komodo BR
3. Lore Lindu BR
4. Tanjung Puting BR
5. Gunung Leuser BR
6. Pulau Siberut BR
7. GSK-BB BR
8. Wakatobi BR
9. Bromo Tengger Semeru Arjuno BR
10. Taka Bonerate-Kep. Selayar BR

High – risk of earthquake

11. Belambangan BR
12. BKDS-KH BR
13. Berbak-Sembilang BR
14. Rinjani Lombok BR
15. Togean Tojo Una Una BR
16. Samota BR
17. Bunaken Tangkoko Minahasa BR
18. Karimunjawa Jepara Muria BR
19. Merapi Merbabu Menoreh BR

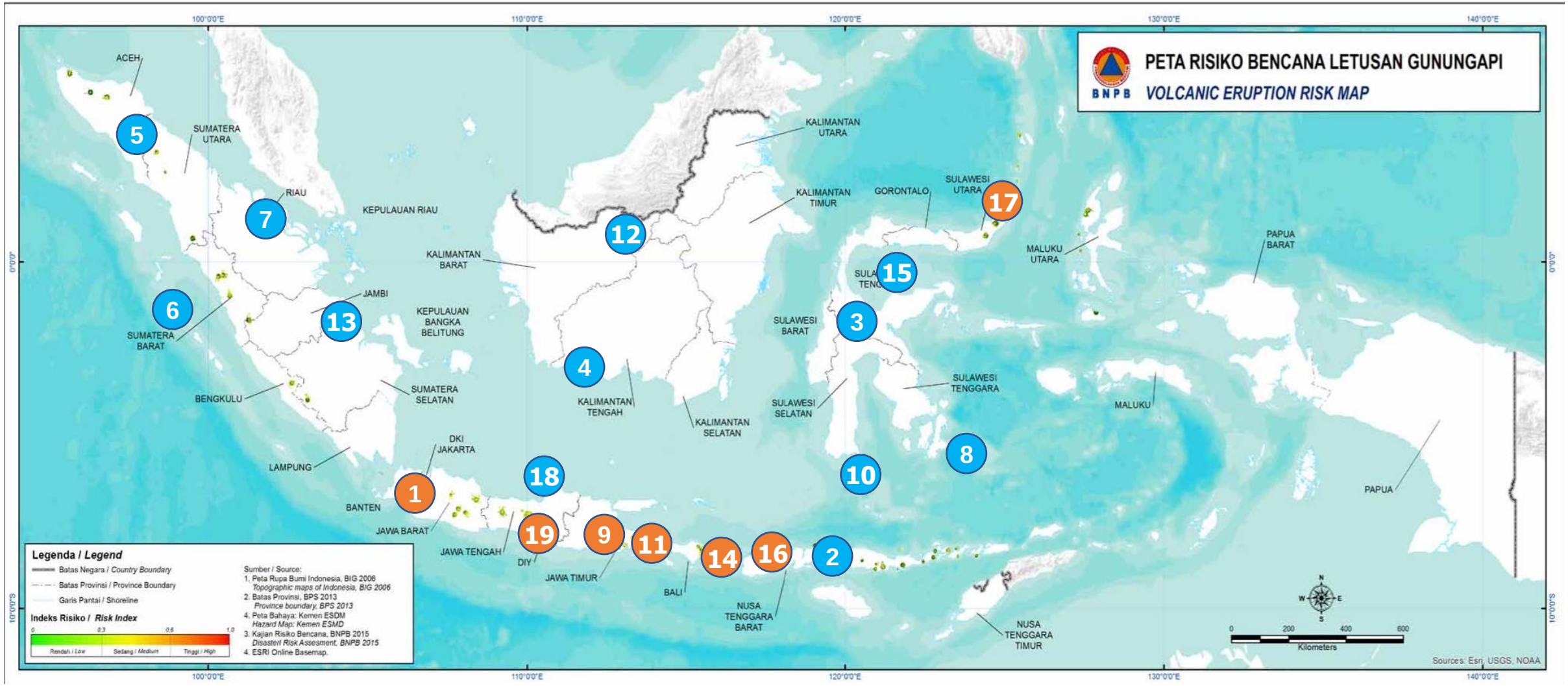


Low – risk from tsunami

1. Cibodas BR
2. Komodo BR
3. Lore Lindu BR
4. Tanjung Puting BR
5. Gunung Leuser BR
6. Pulau Siberut BR
7. GSK-BB BR
8. Wakatobi BR
9. Bromo Tengger Semeru Arjuno BR
10. Taka Bonerate-Kep. Selayar BR

High – risk from tsunami

11. Belambangan BR
12. BKDS-KH BR
13. Berbak-Sembilang BR
14. Rinjani Lombok BR
15. Togean Tojo Una Una BR
16. Samota BR
17. Bunaken Tangkoko Minahasa BR
18. Karimunjawa Jepara Muria BR
19. Merapi Merbabu Menoreh BR



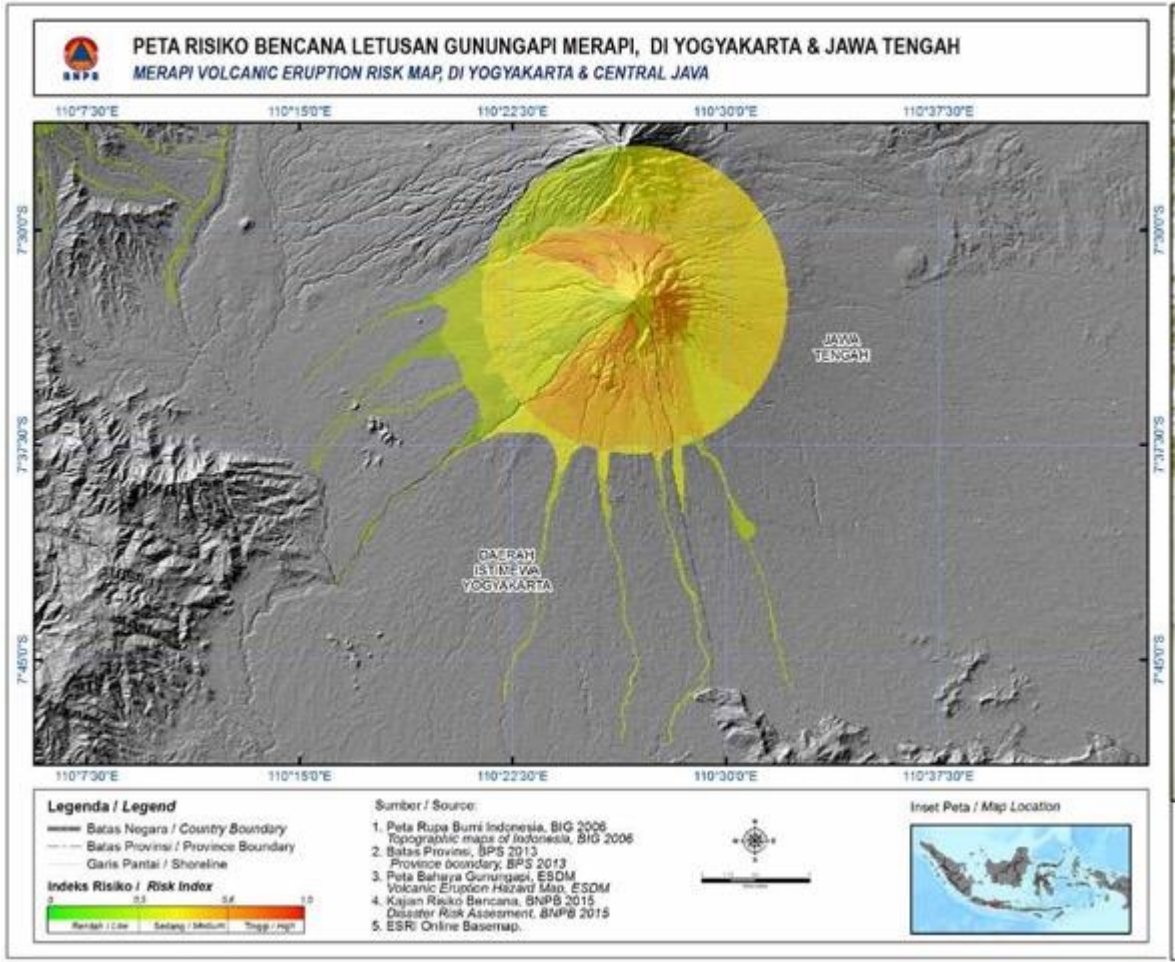
Low – risk volcanic eruption

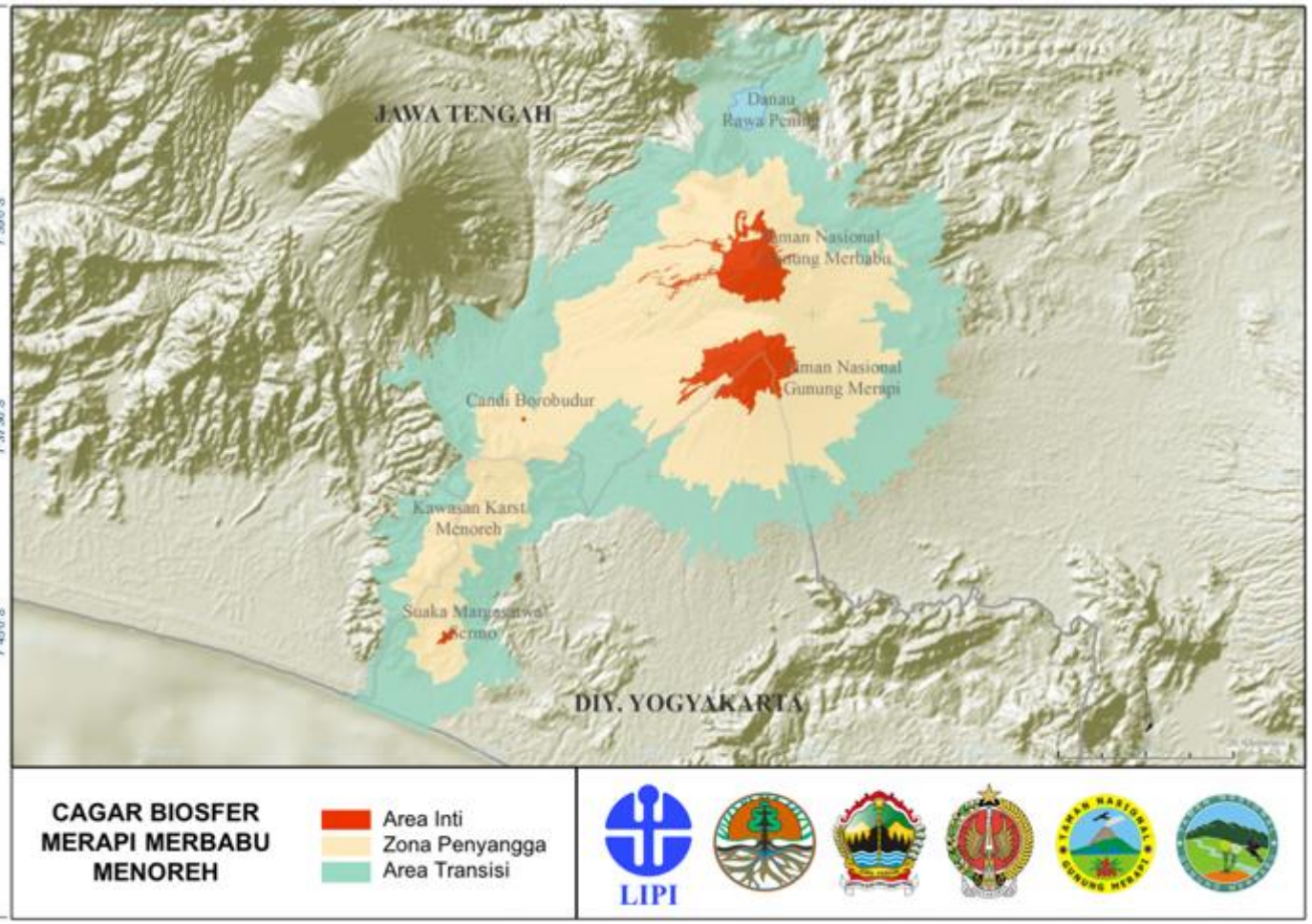
1. Cibodas BR
2. Komodo BR
3. Lore Lindu BR
4. Tanjung Puting BR
5. Gunung Leuser BR
6. Pulau Siberut BR
7. GSK-BB BR
8. Wakatobi BR
9. Bromo Tengger Semeru Arjuno BR
10. Taka Bonerate-Kep. Selayar BR

High – risk volcanic eruption

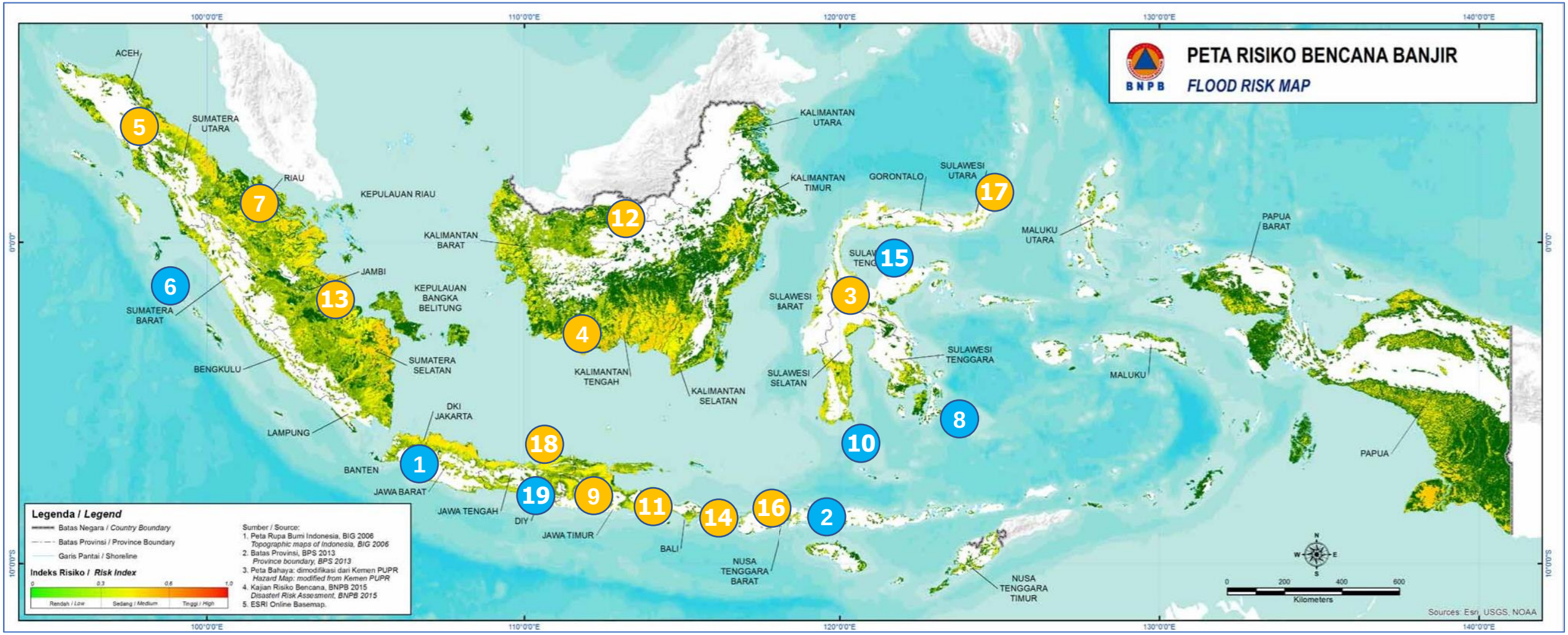
11. Belambangan BR
12. BKDS-KH BR
13. Berbak-Sembilang BR
14. Rinjani Lombok BR
15. Togean Tojo Una Una BR
16. Samota BR
17. Bunaken Tangkoko Minahasa BR
18. Karimunjawa Jepara Muria BR
19. Merapi Merbabu Menoreh BR

Volcanic Eruption Risk of Merapi Merbabu Menoreh BR





Indonesian MAB Programme National Committee

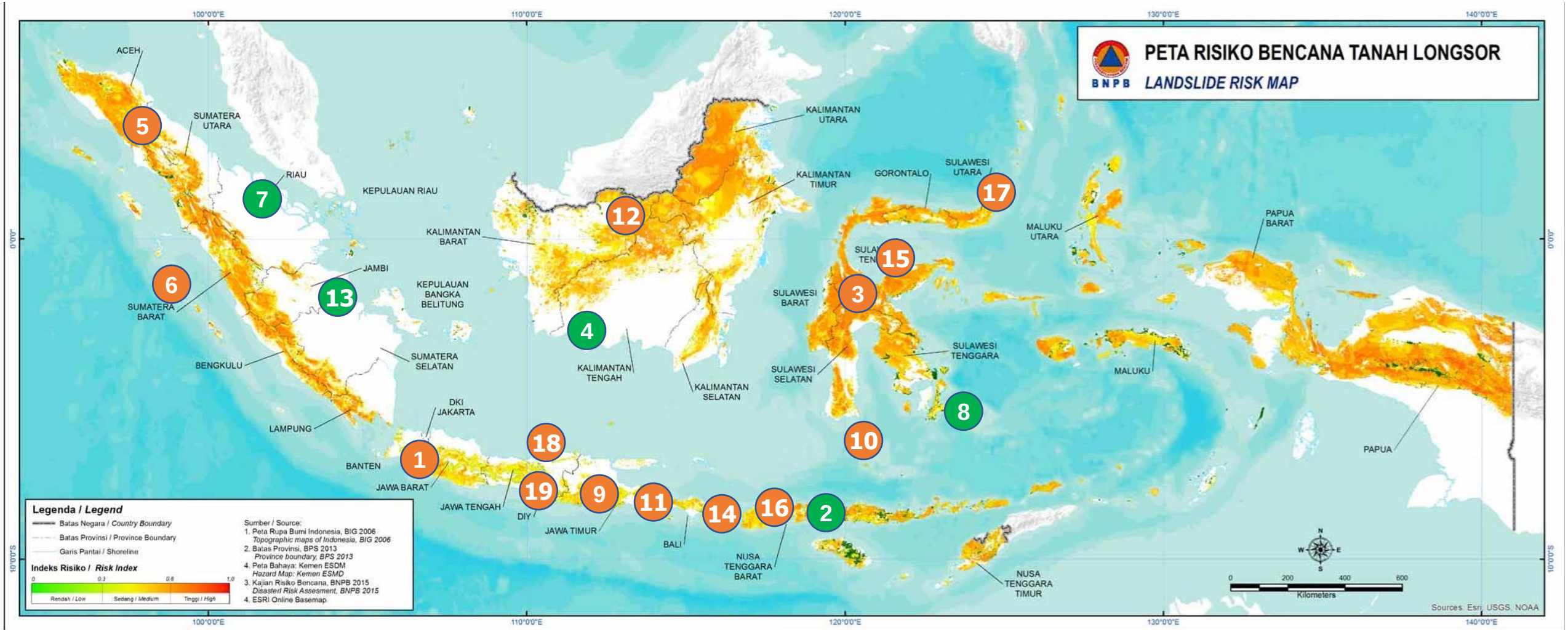


High – risk

1. Cibodas BR
2. Komodo BR
3. Lore Lindu BR
4. Tanjung Puting BR
5. Gunung Leuser BR
6. Pulau Siberut BR
7. GSK-BB BR
8. Wakatobi BR
9. Bromo Tengger Semeru Arjuno BR
10. Taka Bonerate-Kep. Selayar BR

Low – risk

11. Belambangan BR
12. BKDS-KH BR
13. Berbak-Sembilang BR
14. Rinjani Lombok BR
15. Togean Tojo Una Una BR
16. Samota BR
17. Bunaken Tangkoko Minahasa BR
18. Karimunjawa Jepara Muria BR
19. Merapi Merbabu Menoreh BR

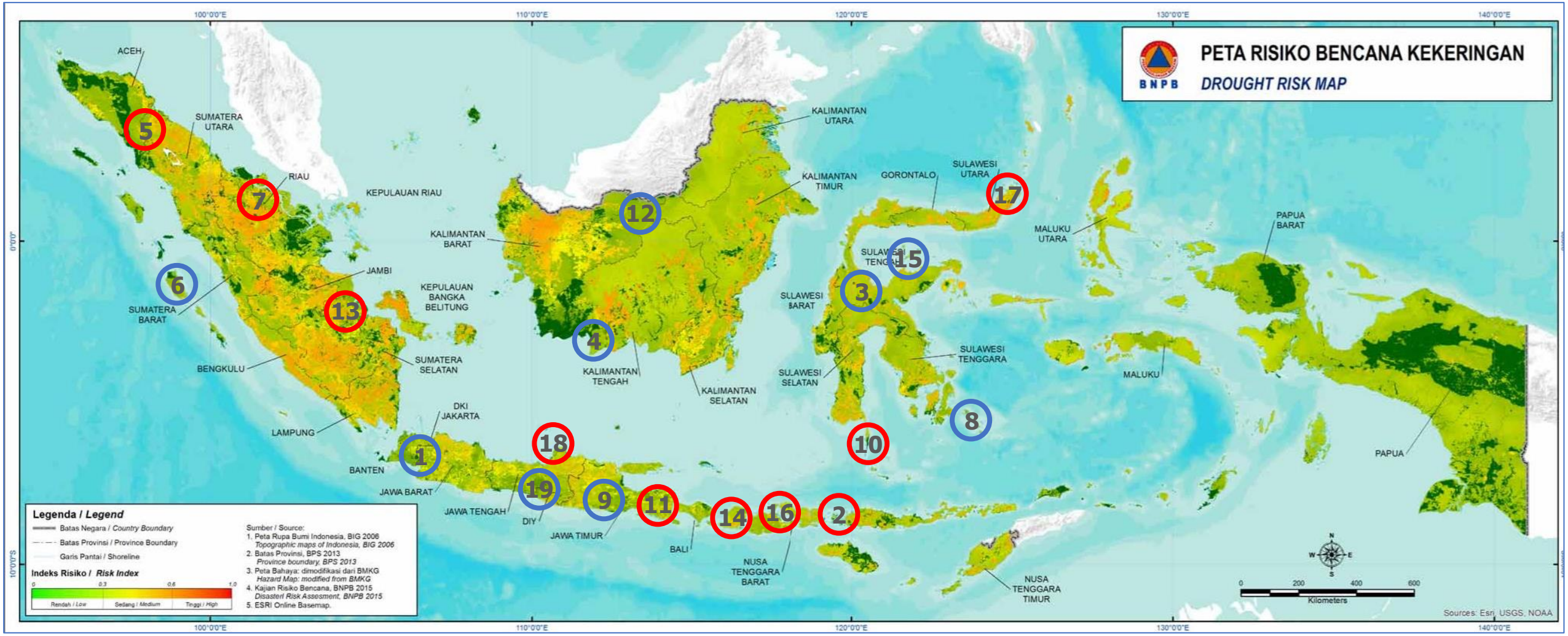


High – risk

1. Cibodas BR
2. Komodo BR
3. Lore Lindu BR
4. Tanjung Puting BR
5. Gunung Leuser BR
6. Pulau Siberut BR
7. GSK-BB BR
8. Wakatobi BR
9. Bromo Tengger Semeru Arjuno BR
10. Taka Bonerate-Kep. Selayar BR

Low – risk

11. Belambangan BR
12. BKDS-KH BR
13. Berbak-Sembilang BR
14. Rinjani Lombok BR
15. Togean Tojo Una Una BR
16. Samota BR
17. Bunaken Tangkoko Minahasa BR
18. Karimunjawa Jepara Muria BR
19. Merapi Merbabu Menoreh BR



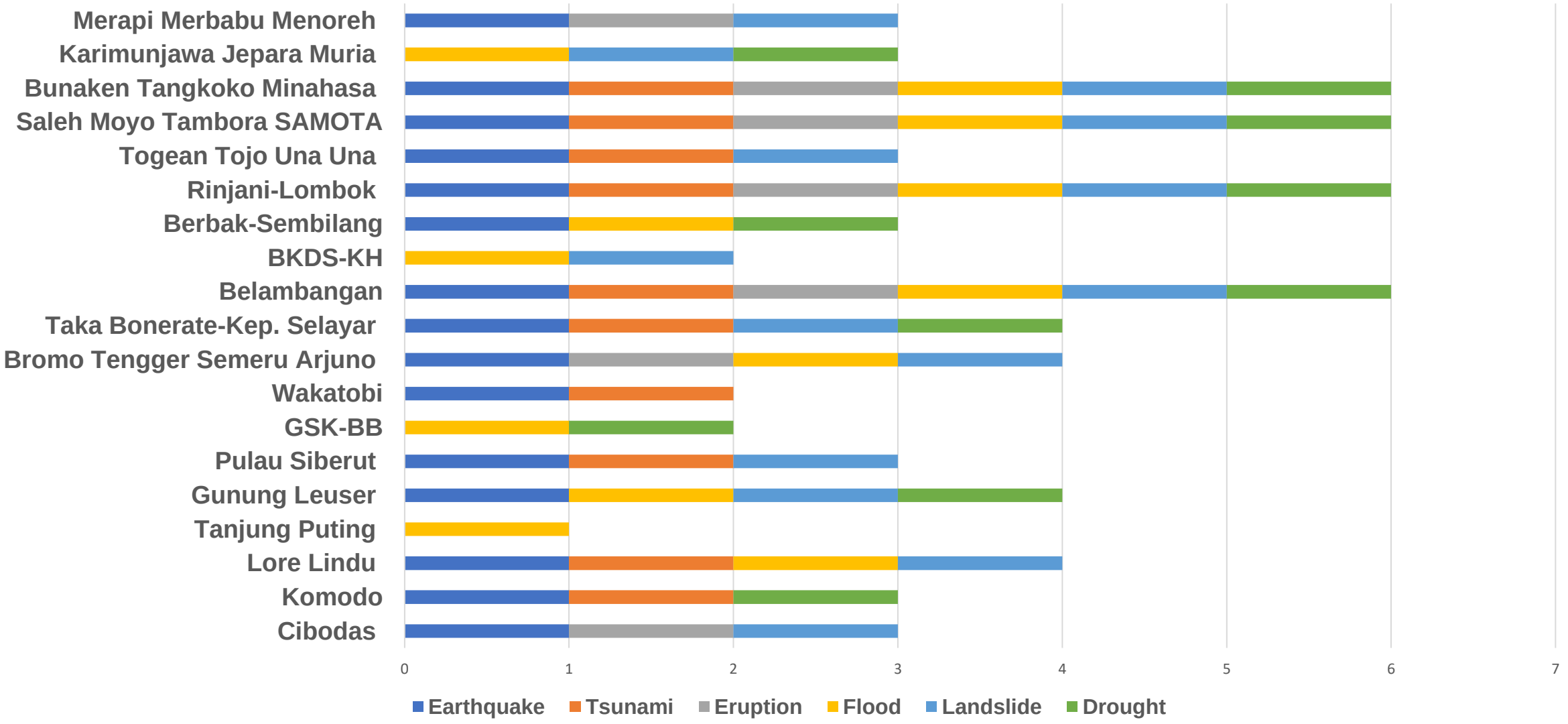
Medium – High risk

1. Cibodas BR
2. Komodo BR
3. Lore Lindu BR
4. Tanjung Puting BR
5. Gunung Leuser BR
6. Pulau Siberut BR
7. GSK-BB BR
8. Wakatobi BR
9. Bromo Tengger Semeru Arjuno BR
10. Taka Bonerate-Kep. Selayar BR

Low – risk

11. Belambangan BR
12. BKDS-KH BR
13. Berbak-Sembilang BR
14. Rinjani Lombok BR
15. Togean Tojo Una Una BR
16. Samota BR
17. Bunaken Tangkoko Minahasa BR
18. Karimunjawa Jepara Muria BR
19. Merapi Merbabu Menoreh BR

Disaster Risk in the Biosphere Reserve Areas




unesco
Indonesia Man and the Biosphere
National Committee
Thank You
BRIN
BADAN RISET
DAN INOVASI NASIONAL

STRATEGY TO OVERCOME THE ECOSYSTEM DEGRADATION: ECOSYSTEM RESTORATION

1. Community Based Management:

- **Community-Based Fishery Management**
- **Community-based tourism management**

2. Approach Concept:

- **Building people**
- **Building the environment and natural resources**
- **Building the economy**
- **Building infrastructure, etc.**

@Prananjaya (2020); @purwnto (2022)

Indonesian MAB Programme National Committee

ECOSYSTEM RESTORATION

1. Identification
2. Mapping
3. Ground-check and method design (include practical meeting)
4. Action: Transplantation→ partnership and community based implementation (management)
5. Monitoring and Evaluation
6. Scaling-up

Socio-Culture
Institution
Economy
Ecology
Policy

STRATEGY

Indonesian MAB Programme National Committee

Ecosystem Restoration in Indonesian Biosphere Reserve

1. Tree adoption
2. Land rehabilitation
3. Mangrove forest restoration
4. Transplantation of coral reef
5. Partnership conservation of flora and fauna and their habitat

Trees Adoption

Purwanto, 2011

Mangrove Restoration








Indonesian MAB Programme National Committee

Source Photos: WNP, TBNP, GRNP,MAB Indonesia, Anonymous, etc.

CORAL REEF TRANSPLANTATION

Source Photos: WNP, TBNP, GRNP,MAB Indonesia, Anonymous, etc.

Indonesian MAB Programme National Committee

PARTNERSHIP ON ECOSYSTEM RESTORATION

ASKUL launched a bold campaign together with APP on tree plantation in Indonesia. A marketing campaign to demonstrate that for every purchase of 1 box PPC from APP, Askul supports: (1) Planting of two trees (1 Box = about 20kg or 10 reams of size A4 paper); (2) Fiber comes from sustainably-managed planted forest; and (3) The campaign emphasizes more trees planted than purchased (1 Box PPC consumes 0.9 tree)

Restoration of Coral Reef Ecosystem
with community involvement

As an effort to restore coral reef ecosystems, by involving the community in ecosystem restoration






@Prananjaya (2020); @purwnto (2022)

Sustainable Utilization of Natural Resources

- Conservation Partnership
- Community Empowerment
- Conservation Education
- Branding BRs Products

Indonesian MAB Programme National Committee

Community Empowerment

Assistance for economic business development to community groups in the area

1. **Community Development**: small scale salt production; fishery processing product, seagrass culture, eco-tourism, handicraft, etc.
2. Community management **capacity building**
3. **Ecosystem restoration training**: Coral transplantation, mangrove rehabilitation, reforestation, trees adoption, land rehabilitation, etc.
4. Conservation **partnership**

@Kompasiona. com;@pranajaya (20201; @purwanto (2022)

Conservation Education for Youth

unesco
Indonesian MAB Programme National Committee

@BTN Taka Bonerate

PARTNERSHIP CONSERVATION OF FLORA AND FAUNA AND THEIR HABITAT

unesco
Indonesian MAB Programme National Committee

Source Photos: WNP, MAB Indonesia, Samota BR, Anonymous, etc.