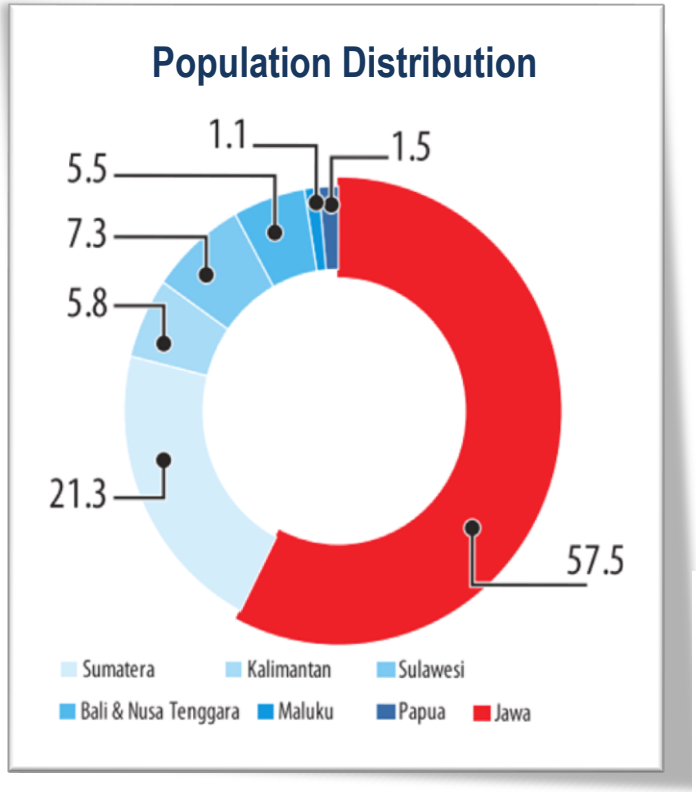
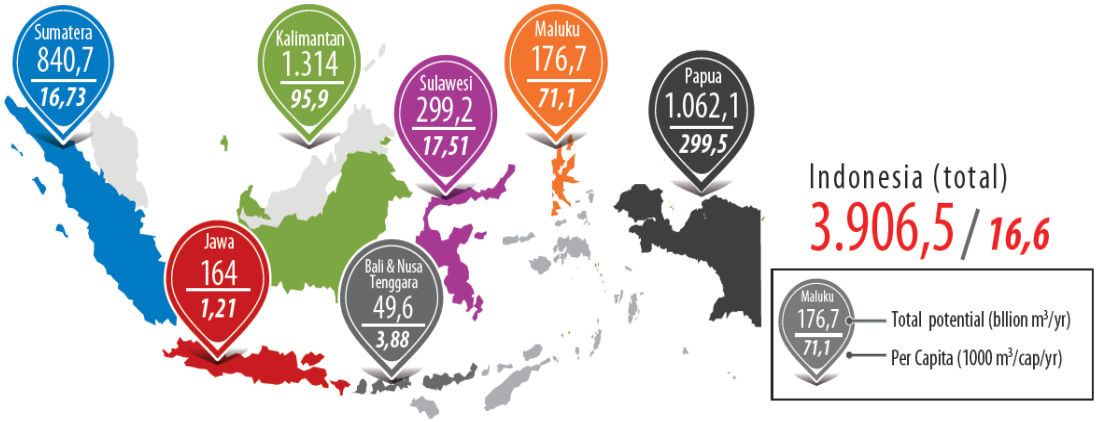
WATER RESOURCES MANAGEMENT- INDONESIA

Population Distribution dan Water Resources Potency of Indonesia



Islands	Population		M³ / cap / year
	Number	Percentage	
Jawa	136,610,590	57.5	1,200
Sumatera	50,630,931	21.3	16,605
Kalimantan	13,787,831	5.8	95,303
Sulawesi	17,371,782	7.3	17,224
Bali & Nusa Tenggara	13,074,796	5.5	3,795
Maluku	2,571,593	1.1	68,722
Papua	3,593,803	1.5	295,551
Indonesia	237,641,326	100	16,439



Sumber: Puslitbang SDA 2012

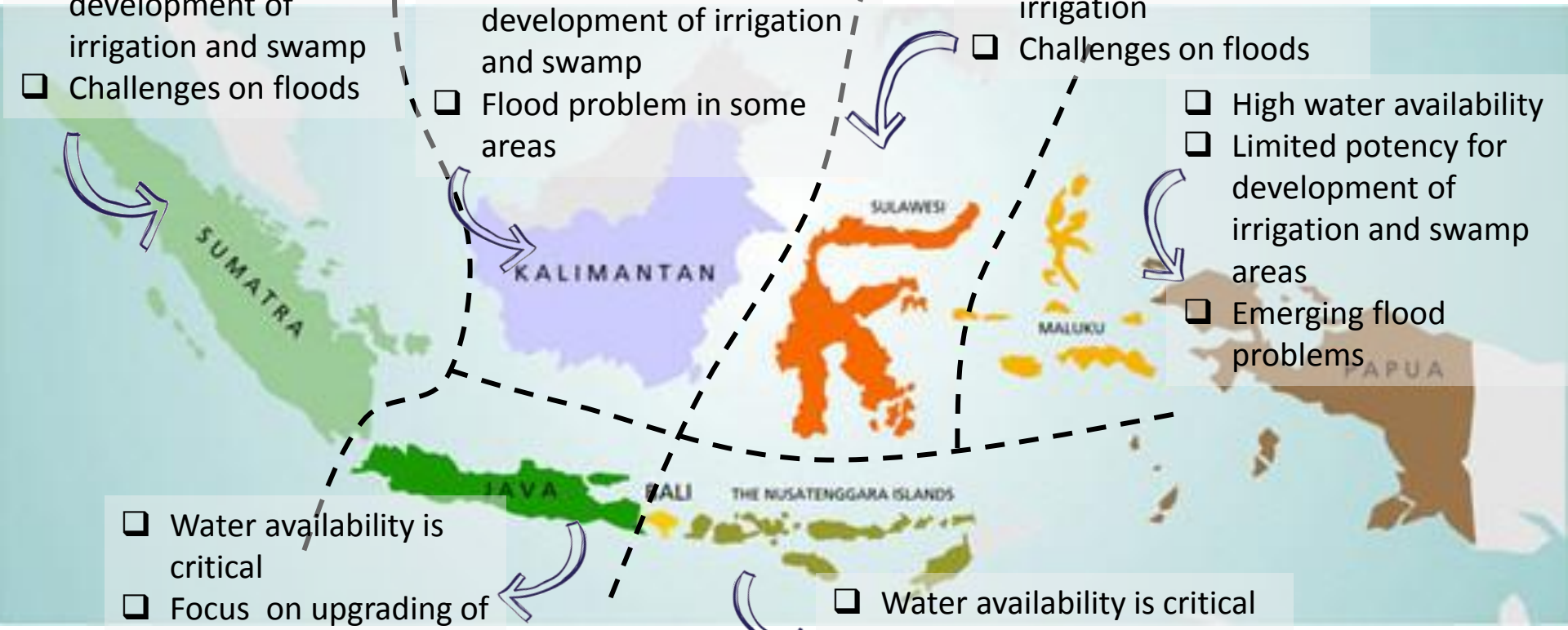
ZONING OF WATER RESOURCES CONDITIONS

- Water availability is adequate
- High potency for development of irrigation and swamp
- Challenges on floods

- Water availability is adequate
- Limited potency for development of irrigation and swamp
- Flood problem in some areas

- Water availability is adequate
- High potency for irrigation
- Challenges on floods

- High water availability
- Limited potency for development of irrigation and swamp areas
- Emerging flood problems



- Water availability is critical
- Focus on upgrading of the existing irrigation scheme
- Flood management is very demanding throughout the areas

- Water availability is critical
- Development on selective irrigation scheme
- Flood problems are relatively low

Trend of Water Related Disaster in Indonesia

Kota-kota Rawan Banjir;

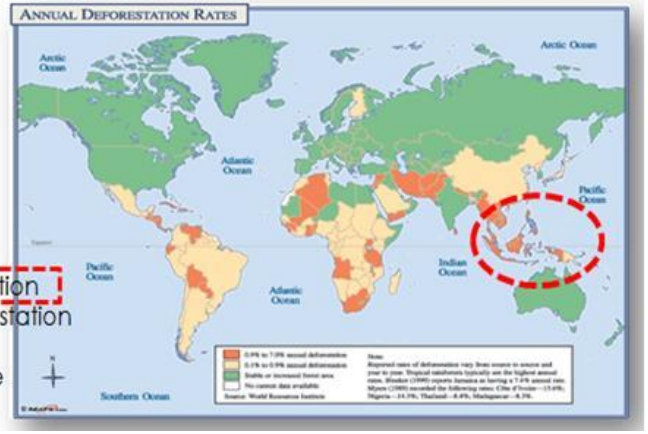
1. Jakarta
2. Bandung
3. Surabaya
4. Solo
5. Medan
6. Padang
7. Pekanbaru
8. Jambi
9. Bd. Lampung
10. Pontianak
11. Samarinda
12. Makassar
13. Ambon
14. Manado
15. Gorontalo
16. Kendari
17. Palembang
18. Jayapura
19. Sorong
20. Palu

DEFORESTATION:

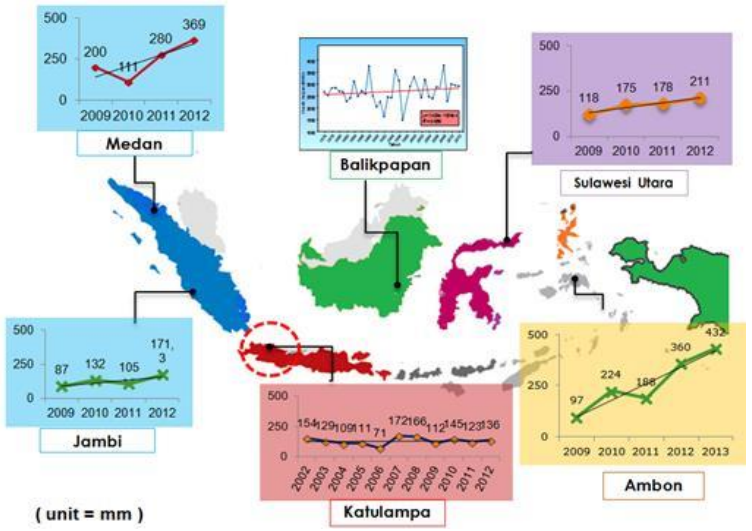
1. Brazil
2. Indonesia
3. Russia
4. Mexico
5. Papua New Guinea
6. Peru
7. USA
8. Bolivia
9. Sudan
10. Nigeria

Legend

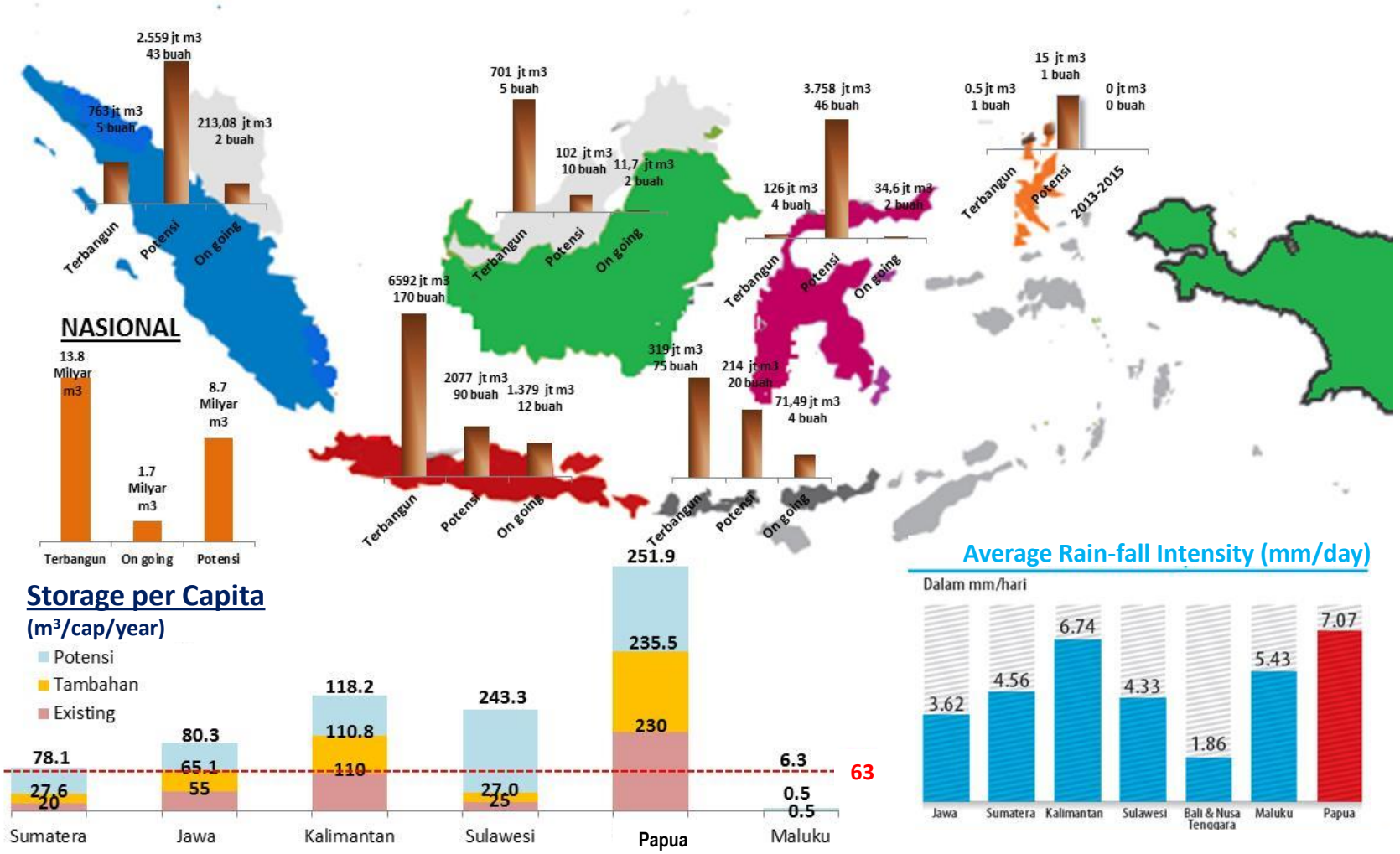
- 0.9 – 7% annual deforestation
- 0.1% - 0.9% annual deforestation
- Stable/ increase forest
- No current data available



ANNUAL MAXIMUM DAILY RAINFALL 2009-2012



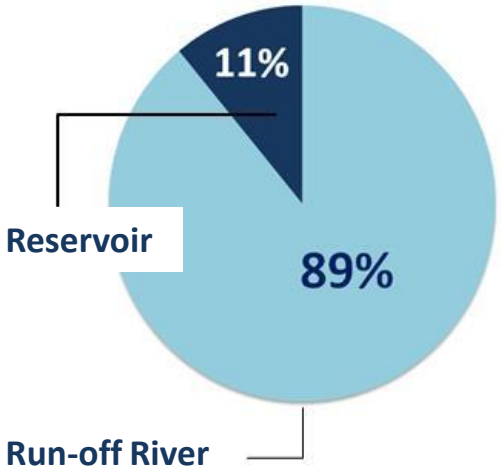
Ratio of Reservoir Storage (m^3/capita/year)



Sustainability of Paddy Fields in Indonesia

Pulau	Sumatera	Java	Bali & NT	Kalimantan	Sulawesi	Maluku	Papua
Area (ha)	1,901,945	2,885,702	629,314	480,320	1,021,921	152,487	39,517
Indeks Pertanaman	1.3	1.9	1.4	1.0	1.3	1.4	1.0
Produktivitas (Ton/Ha)	4.3	5.5	4.8	4.0	4.8	4.2	3.8

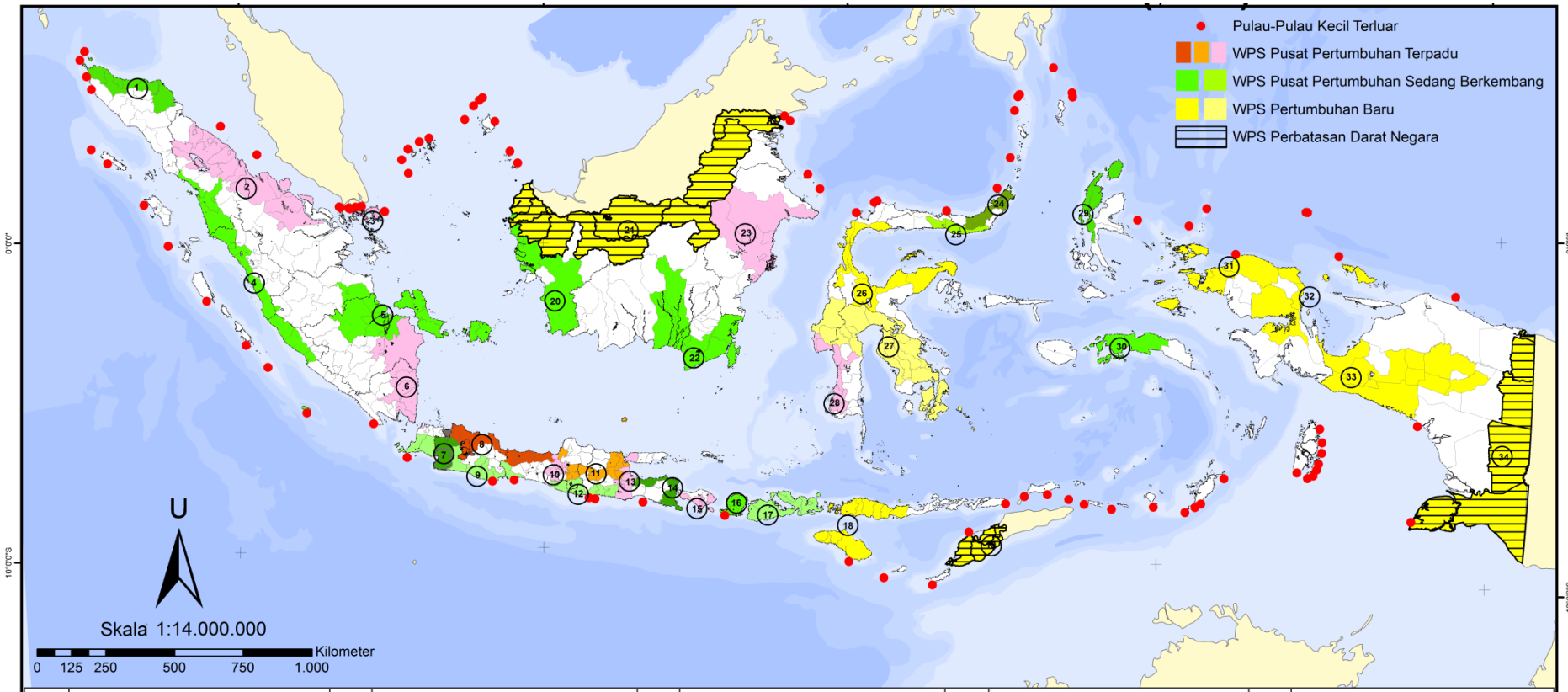
Source of Water



Pressure of Land-use Change:

- Total paddy field areas in Java is 2.9 Million Ha.
- Only 1.6 Million Ha are secured by spatial-planning.
- The remaining are subject to alternation of land-use

Strategic Development Zones for Optimizing Indonesia's Potencies



1	Sabang-Banda Aceh-Langsa	8	Jakarta-Cirebon-Semarang	15	Gilimanuk-Denpasar-Padang Bay	22	Palangkaraya-Banjarmasin-Batulicin	29	Ternate-Sofifi-Daruba
2	Medan-Tebing Tinggi-Dumai-Pekanbaru	9	Tanjung Lesung-Sukabumi-Pangandaran-Cilacap	16	Tanjung-Mataram-Mandalika	23	Balikpapan-Samarinda-Maloy	30	Ambon-Masohi
3	Batam-Tanjung Pinang	10	Yogyakarta-Solo-Semarang	17	Sumbawa Besar-Dompu-Bima	24	Bitung-Manado-Amurang-Kotamobagu	31	Sorong-Manokwari
4	Sibolga-Padang-Bengkulu	11	Semarang-Surabaya	18	Waingapu-Labuan Bajo-Ende-Maumere	25	Gorontalo-Kotamobagu	32	Biak-Manokwari-Bintuni
5	Jambi-Palembang-Pangkal Pinang-Tanjung Pandan	12	Yogyakarta-Prigi-Blitar-Malang	19	Kupang-Atambua	26	Palu-Banggai	33	Nabire-Enarotali-Wamena
6	Merak-Bakauhuni-Bandar Lampung-Palembang-Tanjung Api-Api	13	Malang-Surabaya-Bangkalan	20	Ketapang-Pontianak-Singkawang-Sambas	27	Mamuju-Makale-Palopo-Kendari-Bau bau-Wangi wangi	34	Jayapura-Merauke
7	Jakarta-Bogor-Ciawi-Sukabumi	14	Surabaya-Pasuruan-Banyuwangi	21	Temajuk-Sebatik	28	Makassar-Pare Pare-Mamuju	35	Pulau-Pulau Kecil Terluar

PROGRAM FOR ATTAINING THE WATER SECURITY

STRATEGIC PLAN (2015-2019)

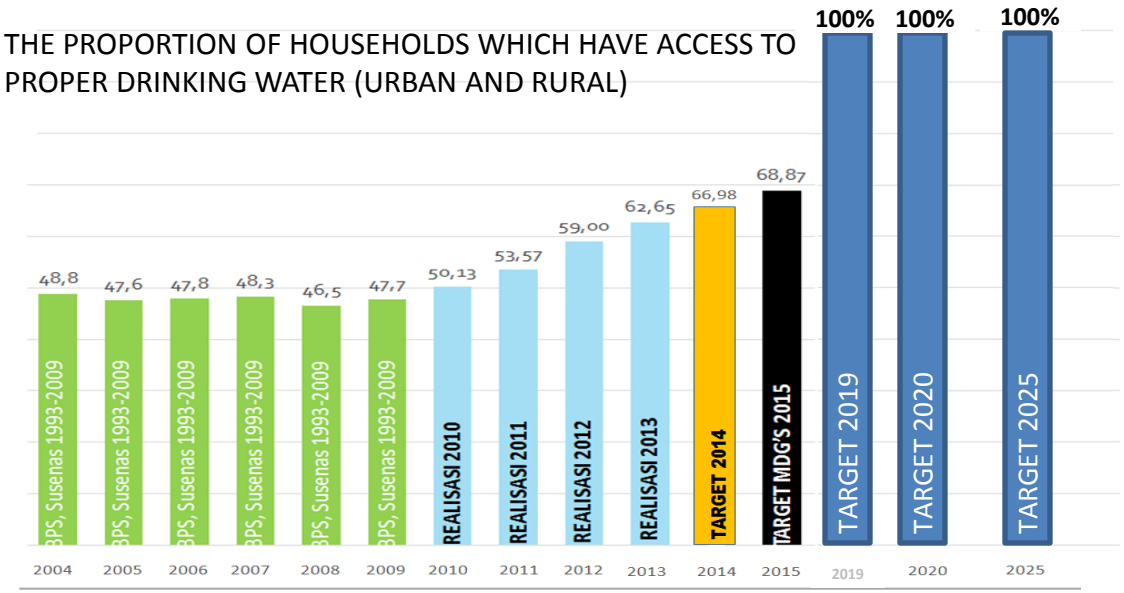
- Development of 49 new high dams in addition to the 16 being constructed (increase the storage capacity from 15,8 billion m^3 to 19 billion m^3)
- Development of 2.500 new small dams (500 new small dams will be constructed per year focusing on the drought prone areas)
- Improving critical lakes and dams
- Revitalizing small natural lakes (situ)
- Improving catchment areas by empowering the water conservation programs, to include erosion and sedimentation management throughout Indonesia.

PROGRAM FOR ATTAINING THE FOOD SECURITY

STRATEGIC PLAN (2015-2019)

- Development of new irrigation areas of about 1 million hectares
- Rehabilitation of the existing irrigation schemes covering areas of about 3,0 million hectares
- **Improving the crop intensity, by means of:**
  - Extending the area of irrigation scheme supported by reservoirs from 960.000 Ha to 1.100.000 Ha
  - Increasing the water used efficiency by modernizing the irrigation system
- **Enhancing the water resources management of existing schemes of swampy areas and groundwater irrigation schemes.**
- **Development of fishpond to support the fishery program**

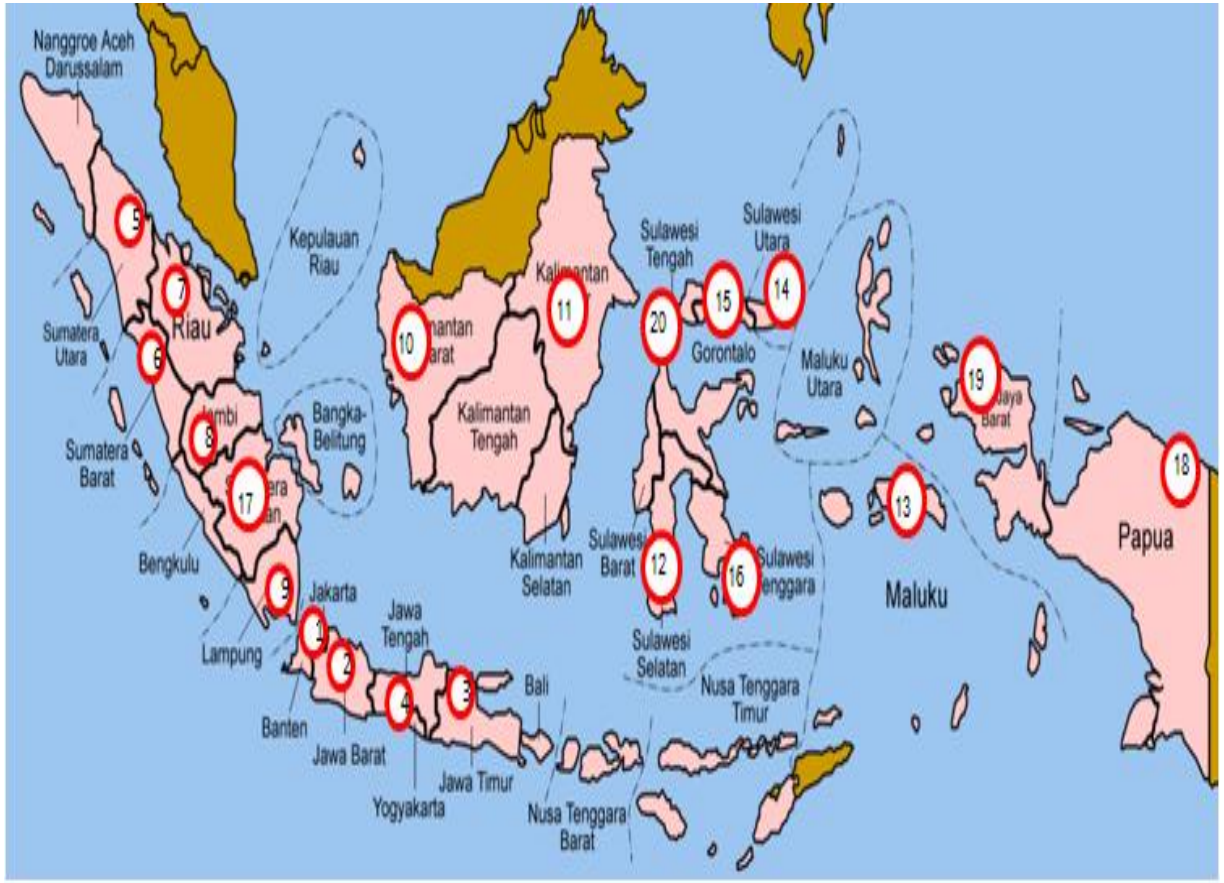
PROGRAM FOR ATTAINING THE RAW WATER SUPPLY



STRATEGIC PLANNING (2015-2019)

- **Aiming to support the coverage of clean water supply** 100 % in 2019
- **Increasing the raw water supply from** 56 m^3/second to 114 m^3/second
- Managing **"idle capacity"** of raw water supply
- Provision raw water for outer islands

MANAGEMENT OF WATER RELATED DISASTER

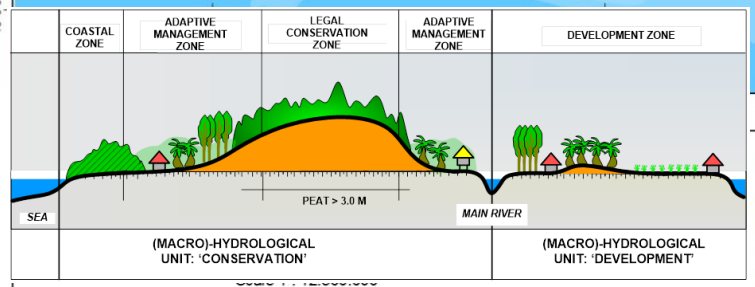


Flood Prone Cities

STRATEGIC PLAN (2015-2019)

- Managing the flood prone areas of about **200 thousand hectares spreading on 20 cities in Indonesia**
- Improving the conveyance of river with a length of about **3000 kilometers**
- Protecting coastal line from abrasion with a total length of about 500 km
- Development of sediment and lahar control structures at about **300 locations**
- Development of **infiltration wells, retention ponds** and **pump houses.**

LOWLANDS DISTRIBUTION IN INDONESIA



Source:
1. Baplan basemap scale 1: 250.000. Ministry of Forestry
2. Indonesian Bathymetry Map
3. Shuttle Radar Topographic Mission (SRTM) 90 m
4. Nationwide study of coastal and near coastal swamp land in Sumatra, Kalimantan and Irian Jaya, 1984. Ministry of Public Works

Projection: Geographic Coordinate System
Datum: WGS 1984

Legend

Lowlands distribution

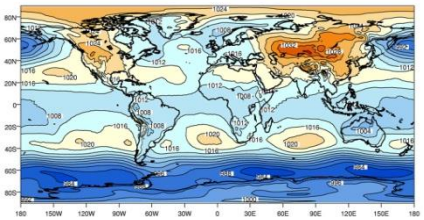
Topographic value:

High : 6553

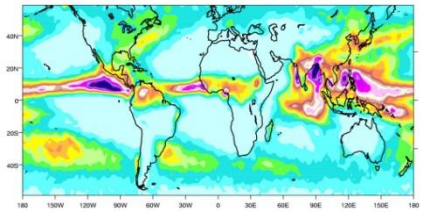
Low : 0

- Completing Macro, Meso and Micro Zoning
- Conforming between zoning results and field conditions
- Revitalizing peat domes and other conservation zones by canals blocking etc.
- Stop issuing new permits for development of peat lands areas
- Constructing deep wells as emergency water sources to support peat land fire fighting.

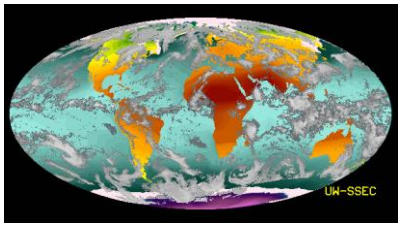
DATA MANAGEMENT, DROUGHT AND FLOOD EARLY WARNING SYSTEM



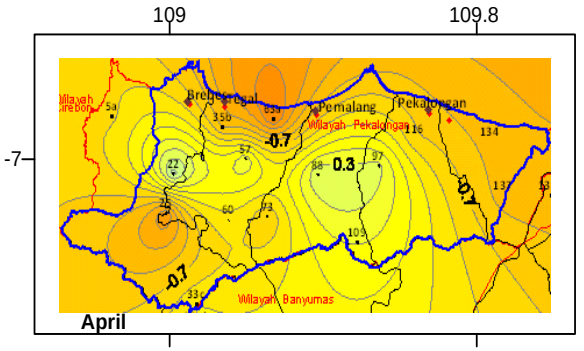
Analysis of global sea current movement

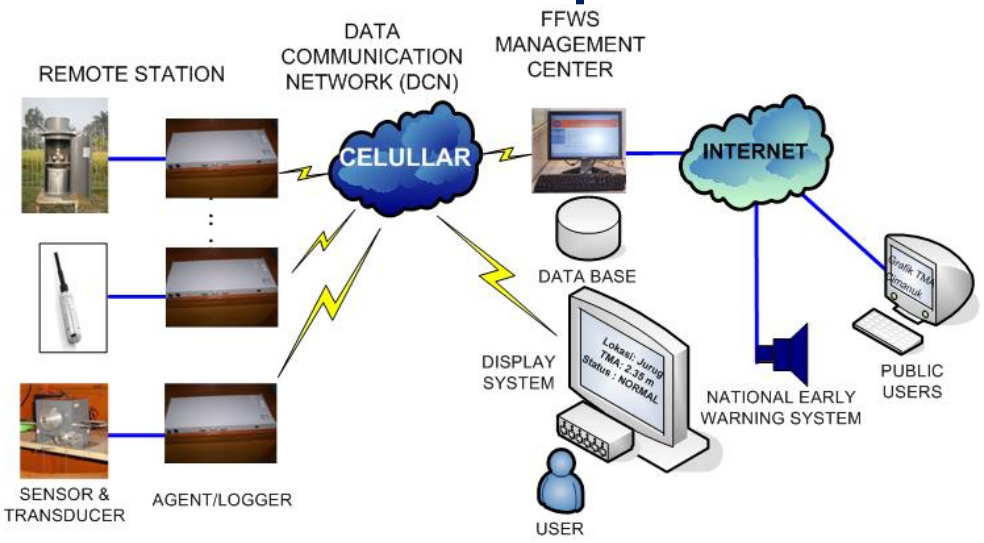


Rainfall forecasting



Satellite observation





- **Extend lead time by using satellite technology and cooperation on data management,**
- **Improve the accuracy of hint-casting and forecasting by telemetry system, rainfall-runoff model and hydrodynamic models.**

CONCLUDING REMARKS

- Indonesia is already subject to many climatic-related hazards, including floods, droughts, storm and landslides.
- Improving our environment and adapting to climate change are an urgent priority for Indonesia.
- Indonesia has begun to introduce strategies of mitigation and adaptation to climate change in our Water Resources Management via Strategic Plan and Implementation Plan of each River Basin.
- These Plans are composed by also taking into account spatial planning and strategic zones development. Later those plans are updated regularly, using up-to-date data, and also analysed using the recent state of the art of water resources management knowledge.
- Adaptation to climate change is a vast task, requiring the coordinated efforts of different actors within and beyond the countries.
- We are all aware that we all need each other, and we should work in a network, where each party is having their own rights and responsibilities.


Thank You