INDONESIAN INSTITUTE OF SCIENCES

LIPI PROFILE & ACTIVITIES

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Executive Director of APCE - UNESCO
Associate Prof in Chemical and Environmental Technology

LEMBAGA ILMU PENGETAHUAN INDONESIA

LIPI

INDONESIAN INSTITUTE OF SCIENCES

Largest Research Institution

Oldest research institution :

Established in 1967
Its history is much older, rooted from colonial era, in 1817 (Center for Plant Conservation/ Bogor Botanical Garden)

Leading Patent Contributor in Indonesia

Largest Research Institution

LEMBAGA ILMU PENGETAHUAN INDONESIA
LIPI
INDONESIAN INSTITUTE OF SCIENCES

- 26 Research Centers
- 18 Technical Implementation Units
- 4 Administrative Bureaus
- 2 International Centers
- 4 Botanical Gardens
- 4823 employees (1543 researchers)
- Located in 11 provinces

World Class Facilities

For Biodiversity and Life Sciences

LEMBAGA ILMU PENGETAHUAN INDONESIA
LIPI
INDONESIAN INSTITUTE OF SCIENCES

- **Herbarium Bogoriense**
  - Third largest herbarium in flora reference collections
  - Established in 1817

- **Zoologicum Bogoriense Museum**
  - Top ten largest fauna specimen reference collections

- **4 Botanical Gardens**
  - Bogor (est. 1817), Cibodas (est. 1861)
  - Bali and Purwodadi (1941)

- **Indonesian Culture Collection (2014)**
  International Standard Facilities inaugurated by former Vice President Wapres Boediono, September 2014

Other Facilities

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INDONESIAN INSTITUTE OF SCIENCES

- **2 Marine Research Vessel**
  - Baruna Jaya VII and VIII

- **National Centre for Scientific Documentation and Information**

- **Center for Measurement and Assesment Standards serves as National Reference for Measurement and Testing**
  LIPI maintain and determine highest National Standard for Physics measurements

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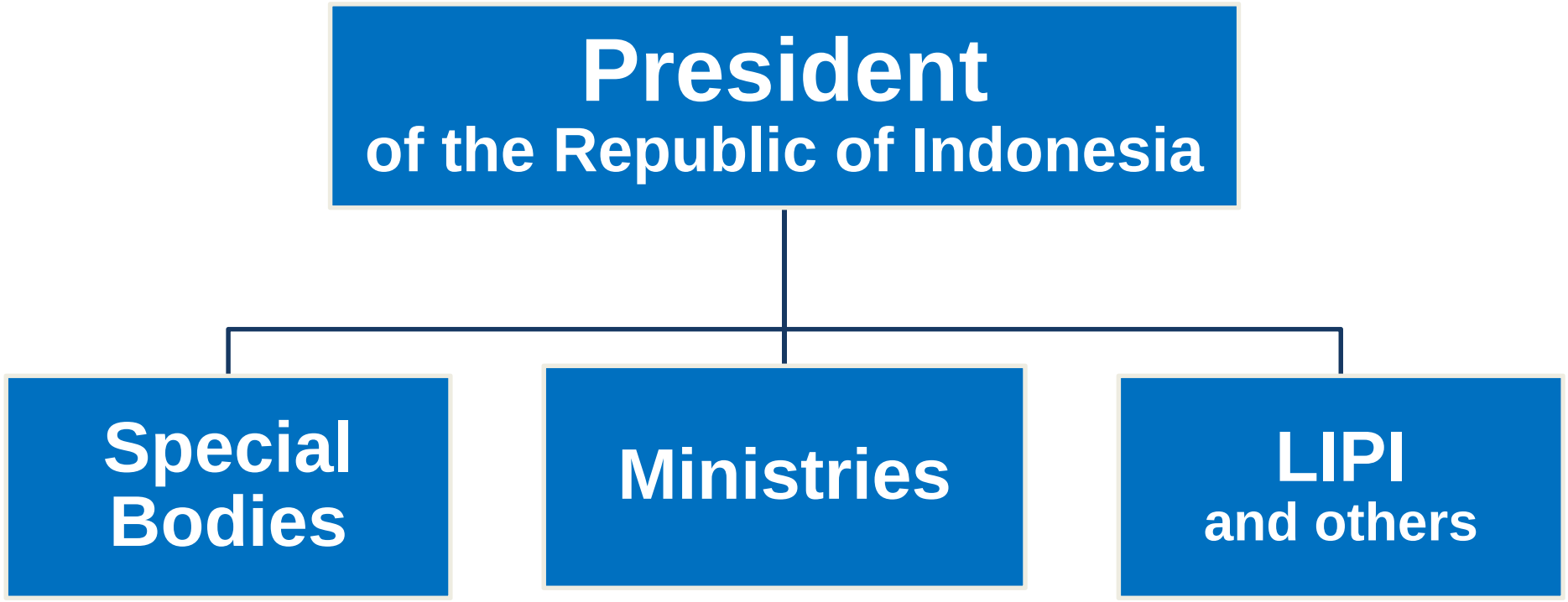
National Hierarchy



Organizational Hierarchy

LEMBAGA ILMU PENGETAHUAN INDONESIA
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INDONESIAN INSTITUTE OF SCIENCES

Chairman of LIPI

Prof. Dr. Iskandar Zulkarnain

Vice Chairman

Prof. Dr. Bambang Subiyanto

Executive Secretary

Dr. Siti Nuramaliati Prijono

Deputy for Earth Sciences

Dr. Zainal Arifin

Deputy for Life Sciences

Prof. Dr. Enny Sudarmonowati

Deputy for Engineering Sciences

Dr. Laksana Tri Handoko

Deputy for Social Sciences and Humanities

Dr. Dra. Tri Nuke Pudjiastuti, M.A.

Deputy for Scientific Services

RESEARCH CENTRES

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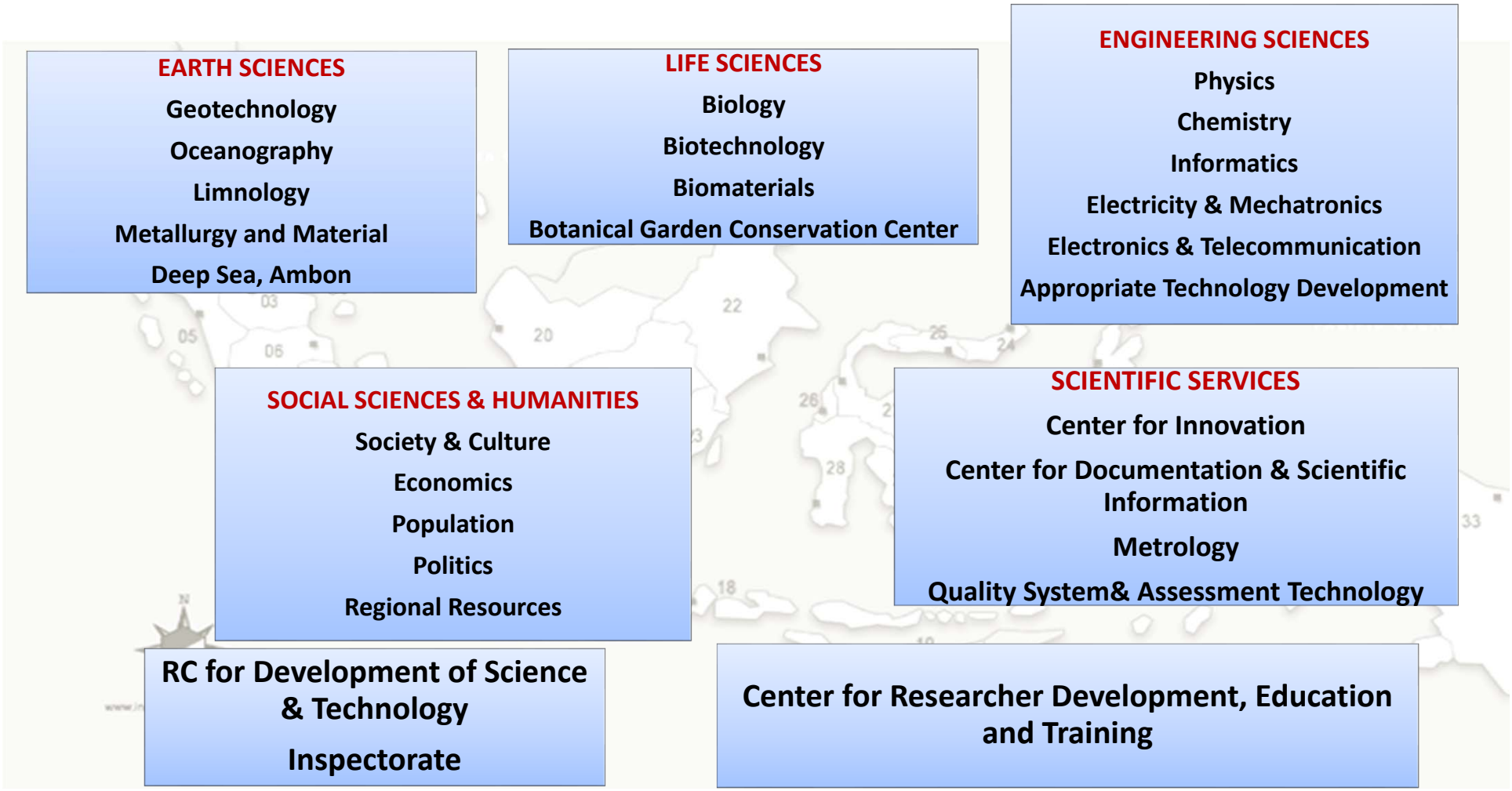

EARTH SCIENCES

- Geotechnology
- Oceanography
- Limnology
- Metallurgy and Material
- Deep Sea, Ambon

LIFE SCIENCES

- Biology
- Biotechnology
- Biomaterials
- Botanical Garden Conservation Center

ENGINEERING SCIENCES

- Physics
- Chemistry
- Informatics
- Electricity & Mechatronics
- Electronics & Telecommunication
- Appropriate Technology Development

SOCIAL SCIENCES & HUMANITIES

- Society & Culture
- Economics
- Population
- Politics
- Regional Resources

SCIENTIFIC SERVICES

- Center for Innovation
- Center for Documentation & Scientific Information
- Metrology
- Quality System& Assessment Technology

RC for Development of Science & Technology

Inspectorate

Center for Researcher Development, Education and Training

Scientific Authority

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1. Governing body for researchers nationwide (training, asssessment and authorization / granting of Research Professorships)
2. Accreditation for Indonesian scientific journals
3. Scientific authority in the fields of:
   a) Biodiversity Conservation and Utilities eg.CITES
   b) Botanical Gardens Construction and Management
   c) Scientific Measurement and Testing

LIPI'S PRIORITY RESEARCH PROGRAM

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- Food Security and Medicines
- Material development, energy and manufacturing engineering
- Regional competitiveness and cultivation of natural resources
- Disaster mitigation and climate change
- Social resilience, economy and culture

LIPI Priority Programmes

LEMBAGA ILMU PENGETAHUAN INDONESIA
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Engineering Sciences

- **Advanced Materials** :
  Battery, Magnet, Polimer, Solar Cell, Coating, Laser/Optic
- **Energy** :
  Biofuel, Biowaste fuel, Motor, Inverter, electric car, BMS, catalyst
- **Security Technology** :
  Radar, robot, cryptography, food processing, telemetry, metrology

Social Sciences and Humanities

- Demography and Population
- Cultural and Linguistic Studies
- Policy and Good Governance
- Regional and Local Autonomy
- Conflict Studies and Poverty

LIPI Priority Programmes

LEMBAGA ILMU PENGETAHUAN INDONESIA
INDONESIAN INSTITUTE OF SCIENCES

Earth Sciences

- Sustainable water supply
- Integrated watershed and ecohydrological research
- Coastal and maritime-based regional development
- Climate change and Disaster risk reduction
- Coral reef ecology and conservation
- Coal and mineral resources

Scientific Service

- Technology Transfer / technology commercialization
- IP Management
- Innovation-based Product Development
- Technology Business Incubation Management
- Research on Innovation System and Policies
- Developing and managing Science and Technopark

LIPI Priority Programmes

LEMBAGA ILMU PENGETAHUAN INDONESIA
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Life Sciences and Biodiversity

- Exploration and Utilization of Bioresources
- Biovillage Development
- Product Commercialization
- Provincial/District Botanic Garden Development
- Institutional programmes: Scientific Authority and MAB
- Core- competence based Programmes:
- Plant Biotechnology, Animal Biotechnology, Microbial Biotechnology
  - Discovery of gene for adaptation to climate change in rice
  - Genetic transformation of plants for various purposes
  - Biodiversity for selection and breeding
  - *In vitro* Technology for propagation and plant Improvement

LIPI Host 2 International Centers

LEMBAGA ILMU PENGETAHUAN INDONESIA
INDONESIAN INSTITUTE OF SCIENCES

- **Asia Pacific Centre for Ecohydrology (APCE) – Under the auspieces of UNESCO (Unesco Category II)**
- International Center for Interdisciplinary and Advanced Research (ICIAR)

Worldwide Network

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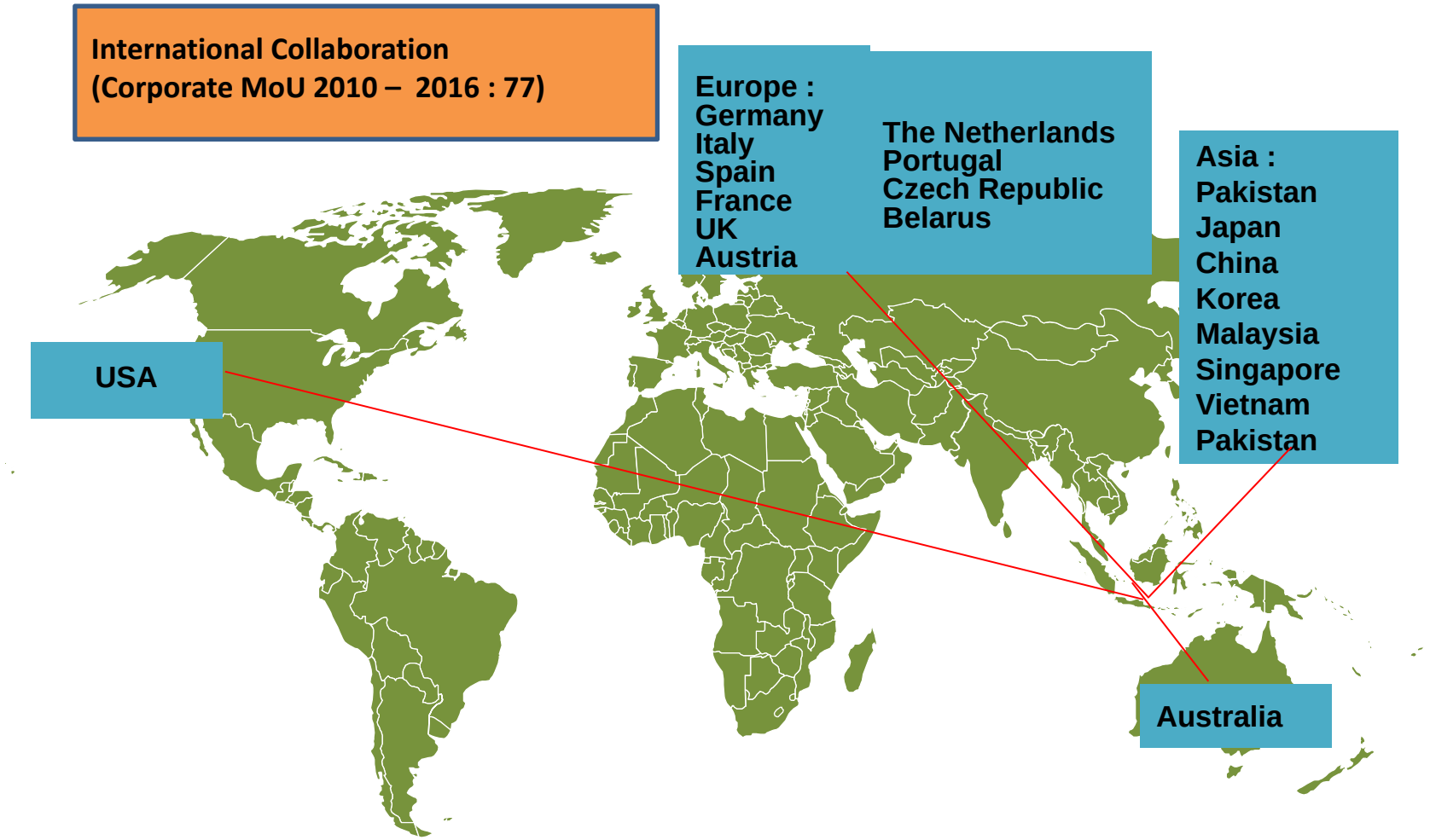
International Collaboration
(Corporate MoU 2010 – 2016 : 77)



MoU PROFILE

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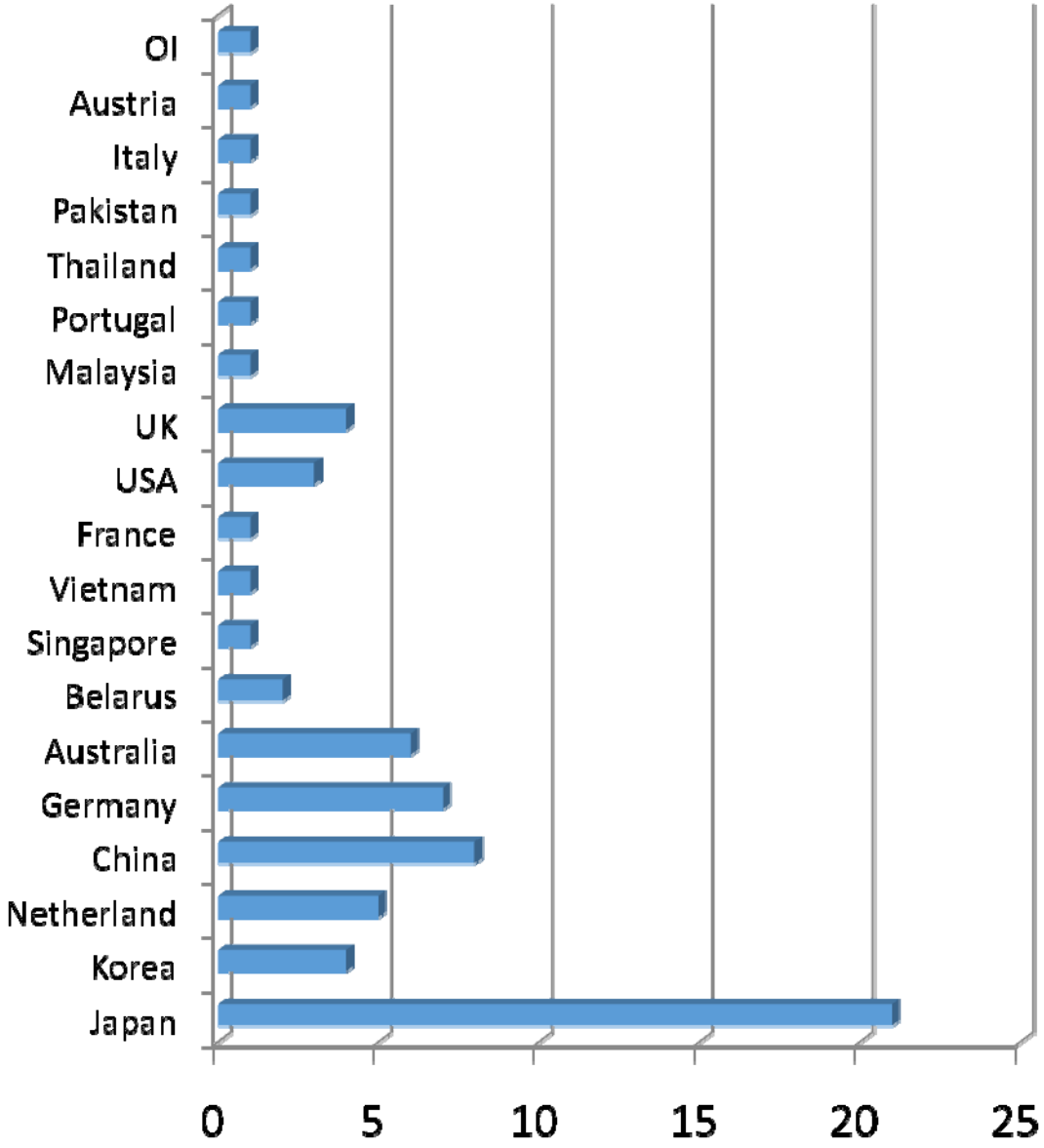
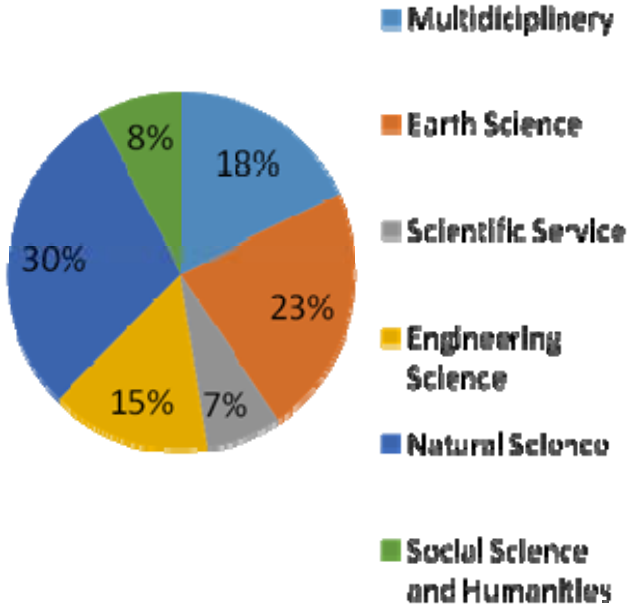


AREAS OF COOPERATION



UNESCO National Focal Points IN LIPI

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- IHP (International Hydrological Program)
  APCE (Asia Pacific Center for Ecohydrology)
- IOC (Intergovernmental Oceanographic Commission)
- MOST (Management of Social Transformations)
- MAB (Man and the Biosphere)
  11 Biosphere Reserves Nation Wide
- IGBC (Intergovernmental Bioethics Committee)
- MOW (Memory of The World)

ASIA PACIFIC CENTRE FOR ECOHYDROLOGY
APCE – UNESCO CATEGORY II CENTRE

Cibinong Sciences Centre – Jl. Raya Bogor Km 46
Cibinong – Bogor – West Java - INDONESIA
Tel.: 021-8757071 Email : ignasdas@yahoo.co.id

APCE DIRECTIVE

- **VISION**
  - To be an Internationally Reputed Asia Pacific Center in Urban and Rural Ecohydrology by 2021
- **MISSION**
  - Develop understanding and practices of ecohydrology through research, training and knowledge exchanges, information systems and public awareness.
- **VALUES**
  - Wisdom
  - Integrity
  - Harmony

STRATEGIC GOAL

1. To promote local resources base ecohydrological research
2. To strengthen local capacity to adopt ecohydrological concept and approach
3. To provide easy access to local resources based ecohydrological information and knowledge
4. To enhance public awareness of local resources based ecohydrological practices

RECENT PROJECTS

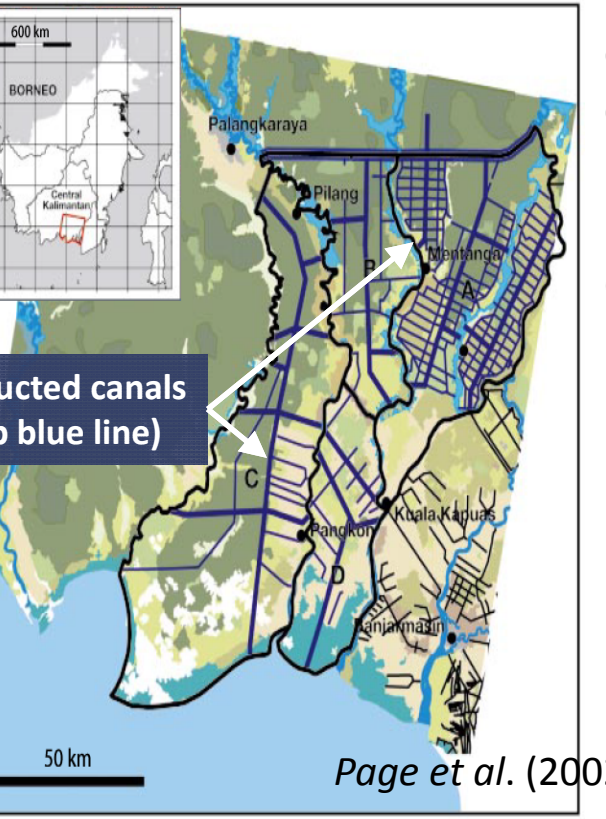
- STUDY ON THE IMPLEMENTATION OF ECOHYDROLOGY APPROACH AND AVOIDED DEFORESTATION IN PEATLAND REWETTING AND CONSERVATION IN EX-MEGA RICE PROJECT
  - Partners : Unesco jakarta, PT. Indonesia Power, UGM, IPB, Bandung Barat Distric Government, LIPI
- DEVELOPMENT OF ECOHYDROLOGY DEMONSTRATION SITE IN SAGULING RESERVOIR, BANDUNG – WEST JAVA
  - Partners : Unesco Jakarta, UPR, ULM, BALITTRA, Balai Rawa, LIPI

Importance of Tropical Peatland

- Indonesia : 14.905.574 ha (Ministry of Agriculture, 2011)
- Tropical peatlands can stored a large amount of carbon.
- Under flooded conditions, aerobic decomposition of soil organic matter is inhibited.
- This undecomposed organic C is accumulated as peat.
- **In this condition, wetland ecosystems usually act as a C sink.**

Wet conditions → C sink → Peatland formation

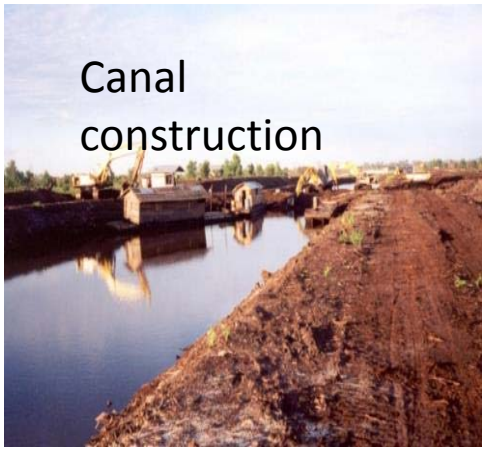
Current Situation of Tropical Peatland



ucted canals
o blue line)

Page et al. (2002)

As shown by deep blue lines in this map, a lot of canals were constructed during the Mega Rice Project, and most of the areas were drained and deforested



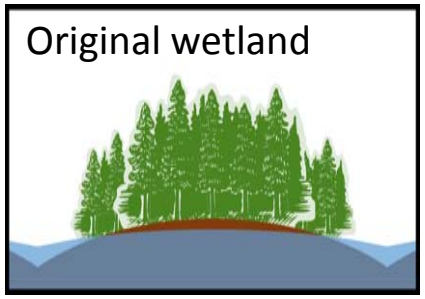
Under dry conditions, the peat will be lost by aerobic peat decomposition, and large peatland fires often occurred

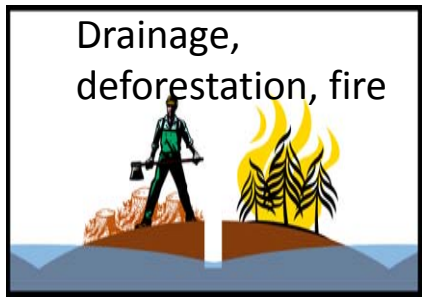
Therefore, the peatland now becomes a great C

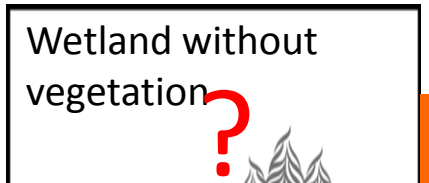
What will happen in the wetland without vegetation?

t of Water Level Recovery

store the original condition
pical peatland, dams are
to block the canals.
s can make the water table
ase and stable the area







From the viewpoint of global warming, under saturated conditions, aerobic CO_2 production is usually reduced. Meanwhile, this conditions will increases anoxic CH_4 production, and also N_2O production by denitrification.

Others C

$CO_2 \downarrow$

$CH_4 \uparrow$

$N_2O \uparrow$

Research Locations

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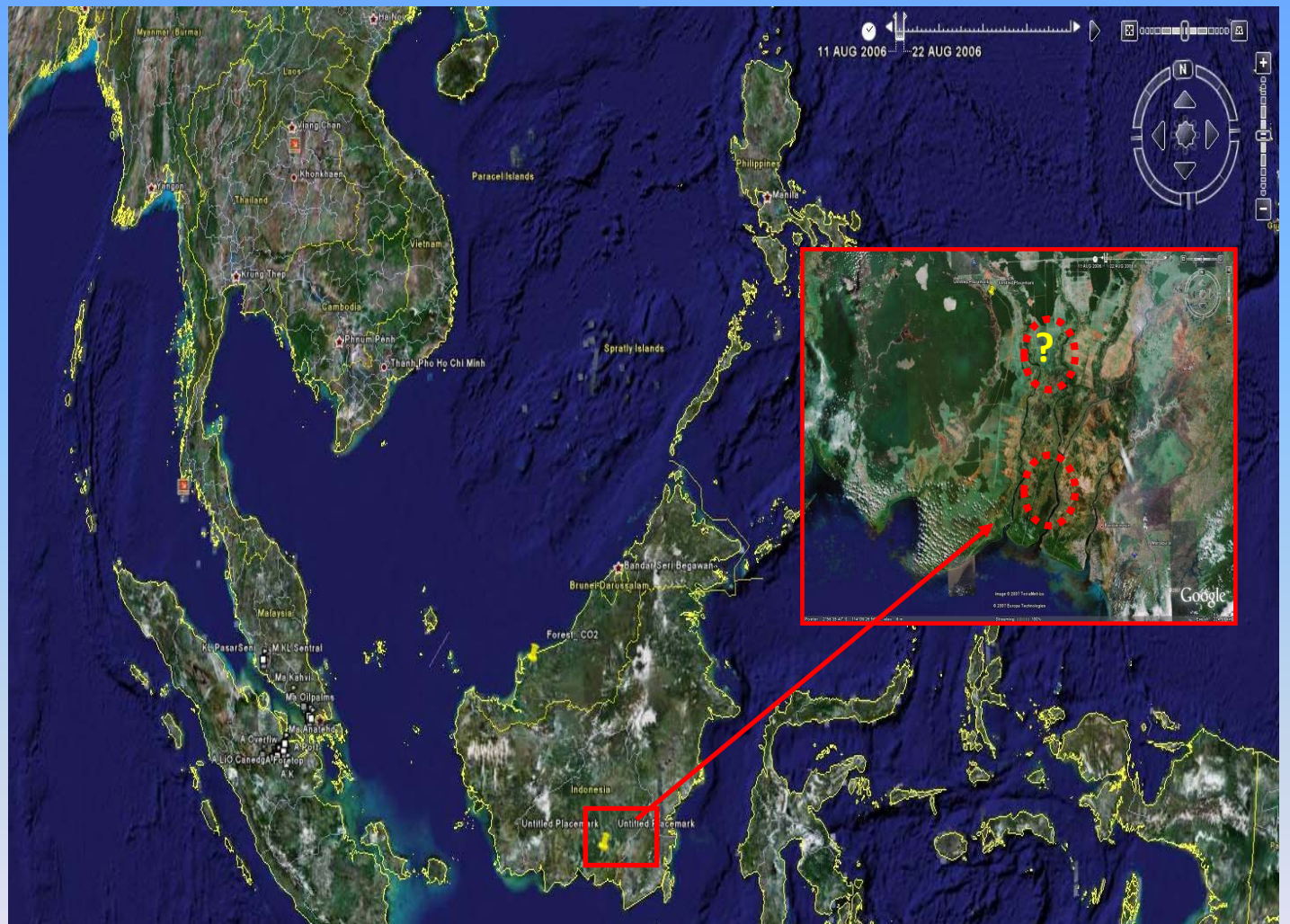
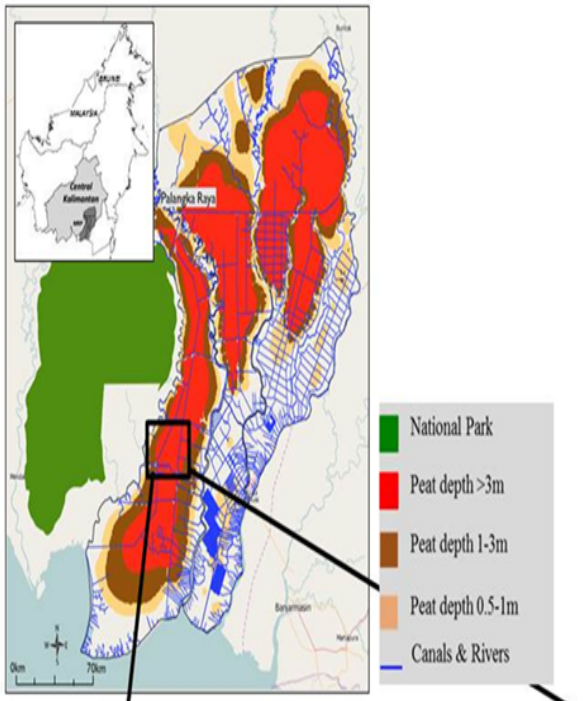
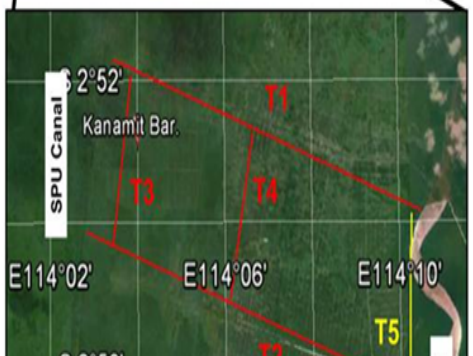


- Rubber Plantation

- Abandoned land

PEAT DISTRIBUTION IN MEGA RICE PROJECT AREA CENTRAL KALIMANTAN





sampling for hydrophysics
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Recommendations

Conservation efforts are needed to reduce the loss of carbon via gas emissions, dissolved organic carbon, risk of peat fires, mitigation of greenhouse gases from peatlands.

Peatlands can be utilized for productive farming to support the economy of farm families by using land management technologies

The involvement of the community (farmer groups) is needed for the sustainability of agriculture in peatlands.

Future Collaboration

GADRI

DPRI

JASTIP


Thank you