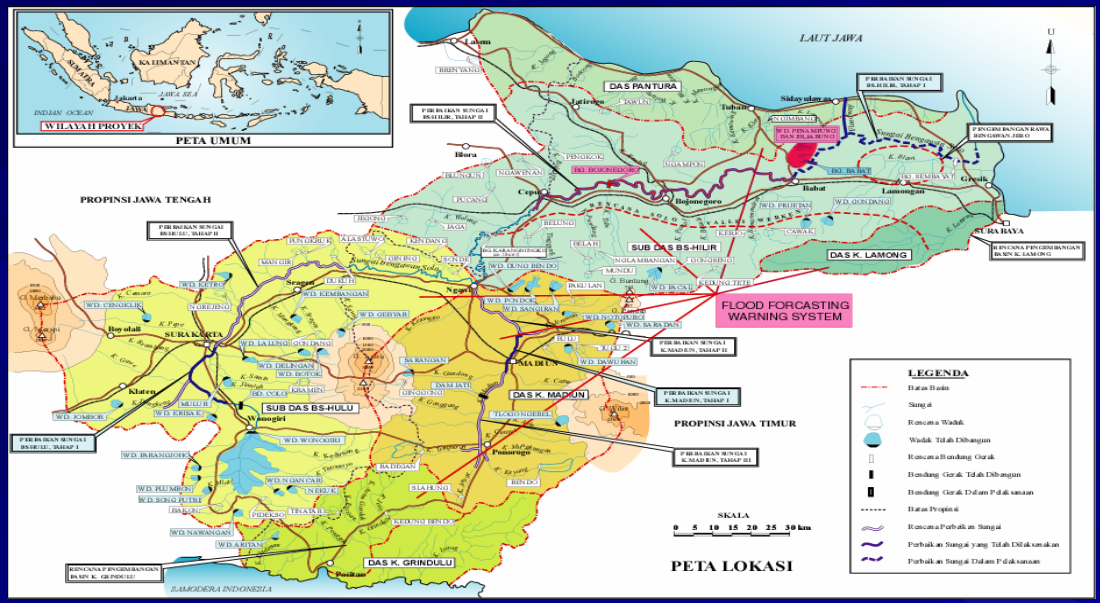
FACILITATING IWRM IN PLANNING and IMPLEMENTATION



FEBRUARY 2008

DEPARTEMEN PEKERJAAN UMUM
DIREKTORAT JENDERAL SUMBER DAYA AIR
BALAI BESAR WILAYAH SUNGAI BENGAWAN SOLO
Jl. Solo – Kartosuro Km. 7, PO Box No. 267 Telp. (0271) 7 16428, Fax : (0271) 716428
SURAKARTA – 57102

FLOWCHART OF PRESENTATION

Big Flood Disaster in 1966

Bengawan Solo River Basin Agency is established, 1969

Bengawan Solo River Basin Development Master Plan, 1974 (OTCA)

1. Wonogiri Multipurpose Dam (1982)
2. Wonogiri Irrig. Project (1987)
3. Wonogiri Irrig. Extension (1990)
4. Various irrig. dam constr. Proj
5. Various irrig. Rehab. Projects
6. Upper Solo R. Improv.Proj (1994)
7. Madiun R. Urgent Flood Control Project (1995)
8. Lower Solo River Improvement Project (2003)

Review Master Plan, 1974 (OTCA) is CDMP(Comprehensive Development and Management Plan) 2001

5 Components, 29 activities:

1. Promote Water Resources Development
2. Strengthen Watershed Management
3. Strengthen Water Quality Management
4. Strengthen Flood Control Management
5. Strengthen Institutional Framework of Water Resources Management

FLOWCHART OF PRESENTATION

5 Components, 29 activities:

1. Promote Water Resources Development
2. Strengthen Watershed Management
3. Strengthen Water Quality Management
4. Strengthen Flood Control Management
5. Strengthen Institutional Framework of Water Resources Management

Some Activities :

1. Urgent Countermeasure For Sedimentation of Wonogiri Multipurpose dam Reservoir
2. Studi on Countermeasure For Sedimentation of Wonogiri Multipurpose dam Reservoir

Some Results of the study :

1. Document of Village Land Conservation Plan in 29 Villages, Gemawang Village is included
2. This plan is done by Participatory Rural Approach (PRA) methode. Persepsi is a NGO who appointed as partnership institution in the process of Village Land Conservation Plan

Implementation of the Village Land Conservation Land by GNKPA

Bengawan Solo River Basin:

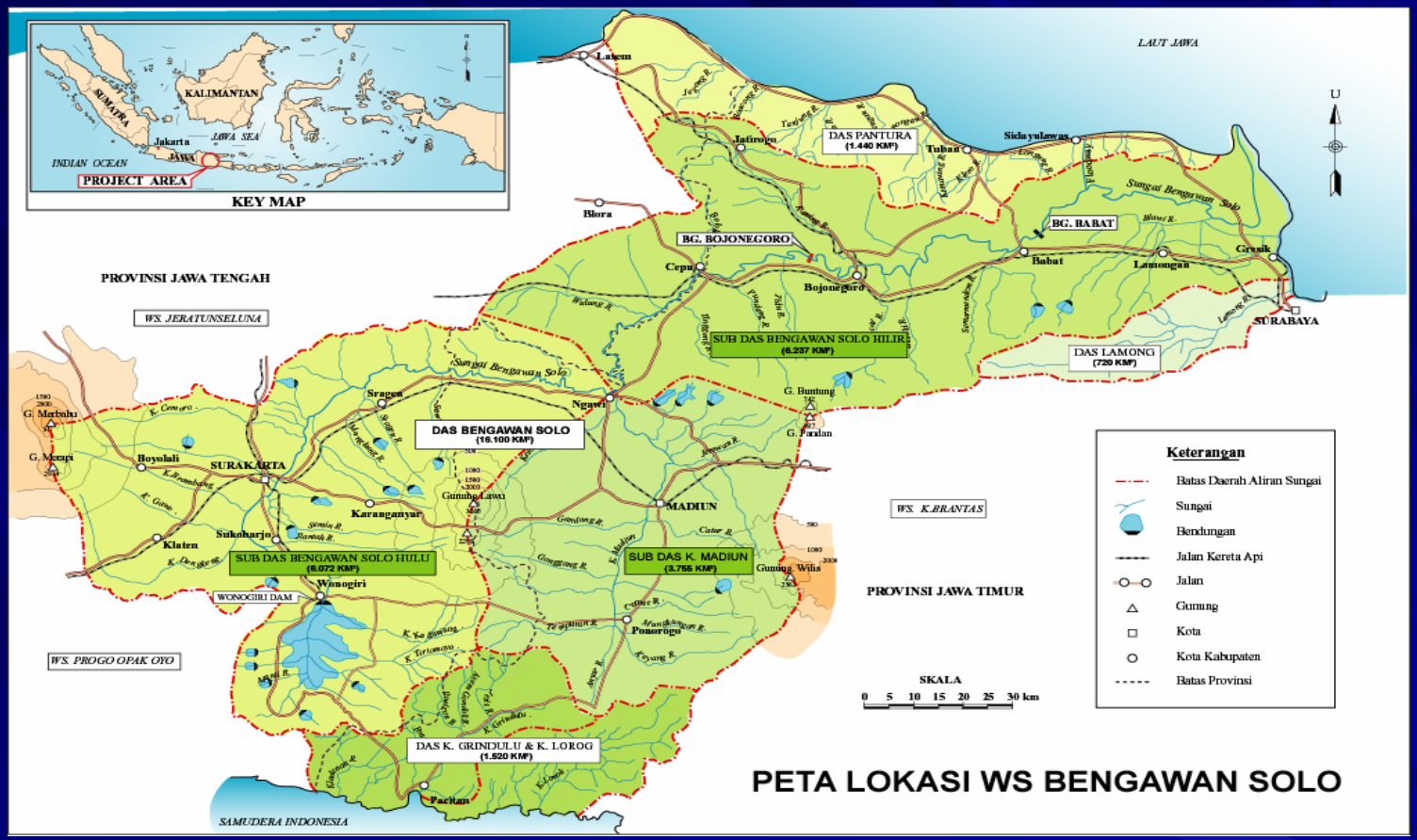
- The Bengawan Solo River is the largest river on the island of Java. It drains a watershed area of around 16,100 km2, discharging into the Java Sea to the north of Surabaya after travelling about 600 km from the Sewu mountain ranges to the south-west of Surakarta.

- The Bengawan Solo River basin is geographically divided the upstream basin into two sub-basins, namely the Upper Solo River basin of 6,072 km2 in the west and the Madiun River basin of 3,755 km2 in the east. The downstream basin is called the Lower Solo River basin with a drainage area of 6,273 km2 and a river length of 300 km from Ngawi to its outfall.

Bengawan Solo River Basin Territory

- These adjacent river basins are components of Bengawan Solo River basin territory, called the Satuan Wilayah Sungai (SWS) Bengawan Solo as shown in the Location Map. The total area amounts to around 19,780 km2 comprising major watershed areas:
  a. Bengawan Solo River basin of 16,100 km2,
  b. Grindulu and Lorog River basins in Pacitan of 1,520 km2,
  c. Small river basins in the north coastal area of 1,440 km2, and
  d. Lamong River basin of 720 km2.

Bengawan Solo River Basin Territory



No.	River Basin	River basin Area	
1.	Bengawan Solo River Basin	16.100	Km^2
2.	Grindulu, Teleng and . Lorog River Basin	1.520	Km^2
3.	Lamong River Basin	720	Km^2
4.	Small river basins in the north coastal area	1.440	km^2

Bengawan Solo River Basin Territory

No	Province	Regency / Municipality
1.	Central Java (9 regencies/ municipalities)	Regencies : Boyolali, Klaten, Sukoharjo, Wonogiri, Karanganyar,Sragen, Blora, Rembang, Municipality : Surakarta ,
2.	East Java (11 regencies/ municipalities)	Regencies : Pacitan, Ponorogo, Madiun, Magetan, Ngawi, Bojonegoro, Tuban, Lamongan, Gersik, Municipalities : Madiun,and Surabaya,

Master Plan in 1974

- The Master Plan in 1974 (OTCA) emphasized basin-wide water resources development comprising various multipurpose dam projects, irrigation and agricultural development projects, river improvement and flood control projects, hydropower projects, sand prevention projects, and lowland development projects.

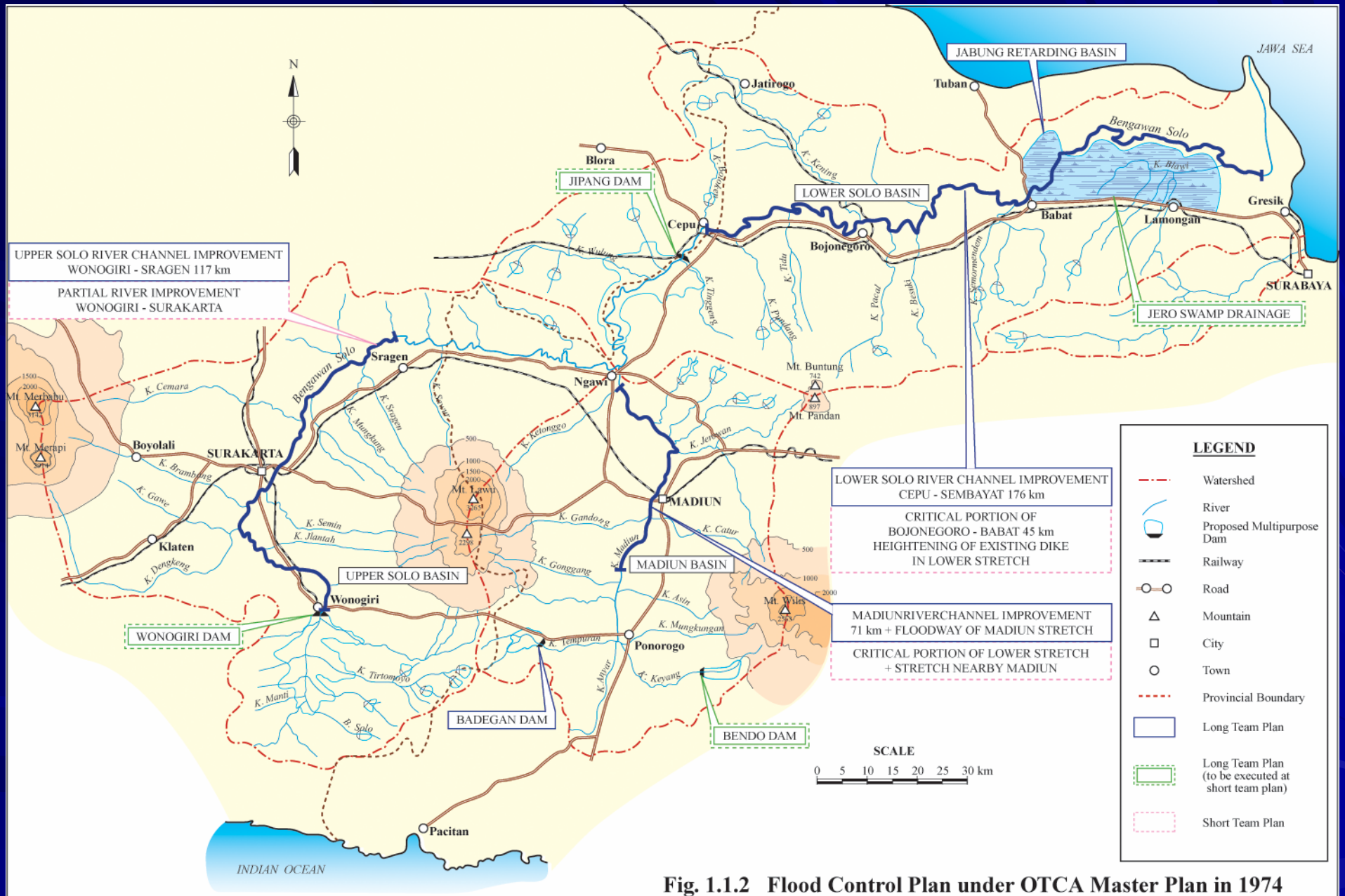


Fig. 1.1.2 Flood Control Plan under OTCA Master Plan in 1974

Realization of Master Plan 1974:

- Wonogiri Multipurpose Dam Project (completed in 1982)
- Wonogiri Irrigation Project (completed in 1987)
- Wonogiri Irrigation Extension Project (completed in 1990)
- Various irrigation dam construction projects
- Various irrigation rehabilitation projects
- Upper Solo River Improvement Project (completed in 1994)
- Madiun River Urgent Flood Control Project (completed in 1995)
- Lower Solo River Improvement Project (2003)

Necessity of Master Plan 1974 Update.

- During 1974 up to 1999, social and economic conditions within the Bengawan Solo River basin have changed significantly and the river morphology has also been modified
- Such a development strategy for the Bengawan Solo River basin basically might remain unchanged, but there is a need for review and updating, duly considering recent national concerns as summarized below :

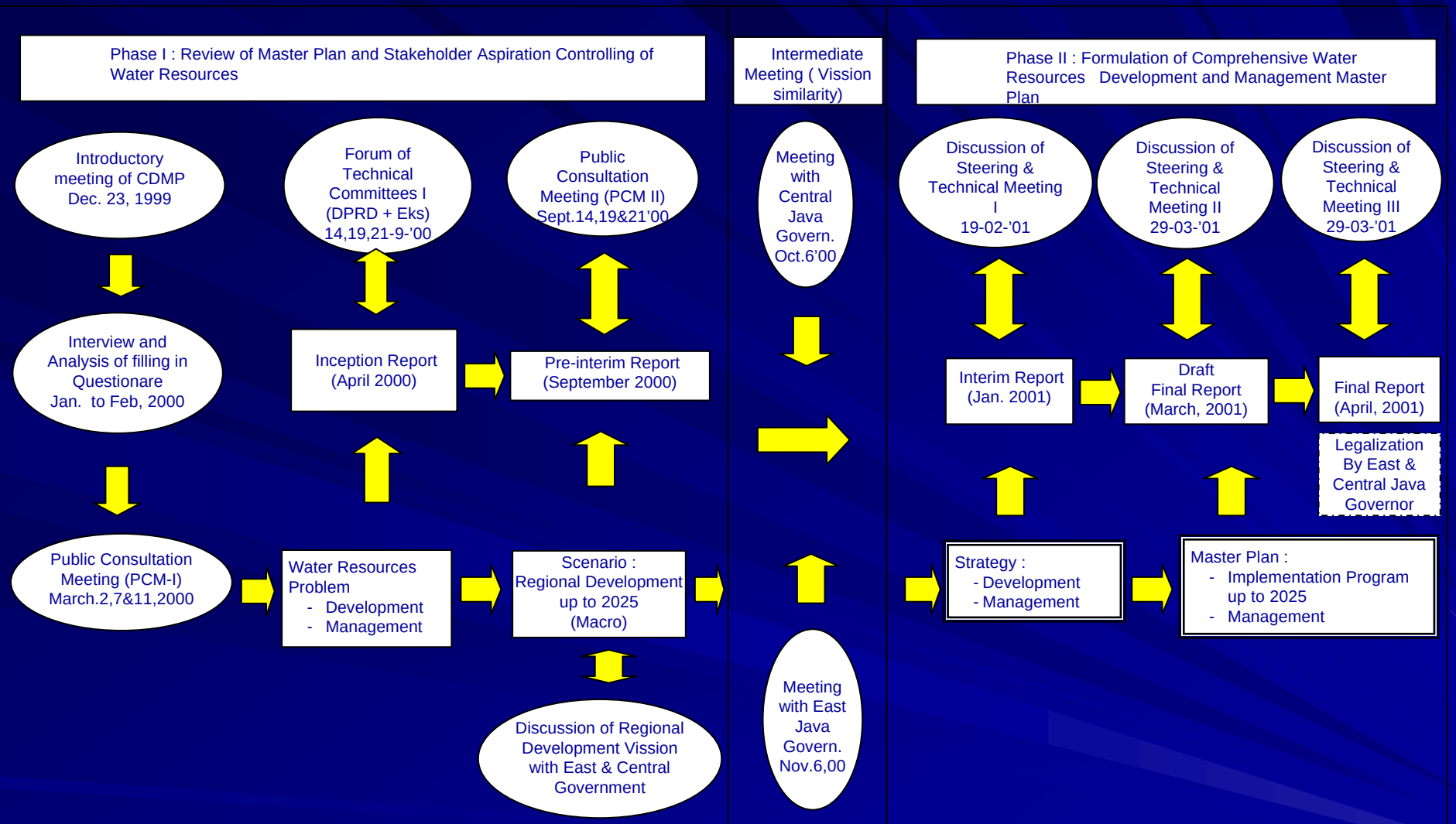
- Water resources development, in particular reservoir-type projects, will inevitably cause social and natural environmental impacts.
- Rapid industrialization and urbanization demands more water, hence exploitation of water resources becomes a priority. Public water supply should be developed to improve social well-being and support industrial development in the nation.

- There are important changes and trends with regard to institutions of water resources sectors at the national, provincial and kabupaten levels under the new framework of regional autonomy. These trends relate to decentralization, coordination, consultation and legislative reform. The basic policy of decentralization is also proceeding in the water resources sector. Intensified and increased public consultation and a greater focus on a “bottom-up” planning approach is expected as a basis to guide water resources development in a more equitable and sustainable manner.

Comprehensive Water Resources Development and Management Plan (CDMP) for the Bengawan Solo River Basin / Master Plan 2001.

During CDMP Study broadly comprises the following two phases:

- Phase I: Review of the Existing Plans and Studies, and Basic Studies
- Phase II: Formulation of Water Resources Development and Management Master Plan



BENGAWAN SOLO - CDMP STUDY
ACTIVITIES FRAME

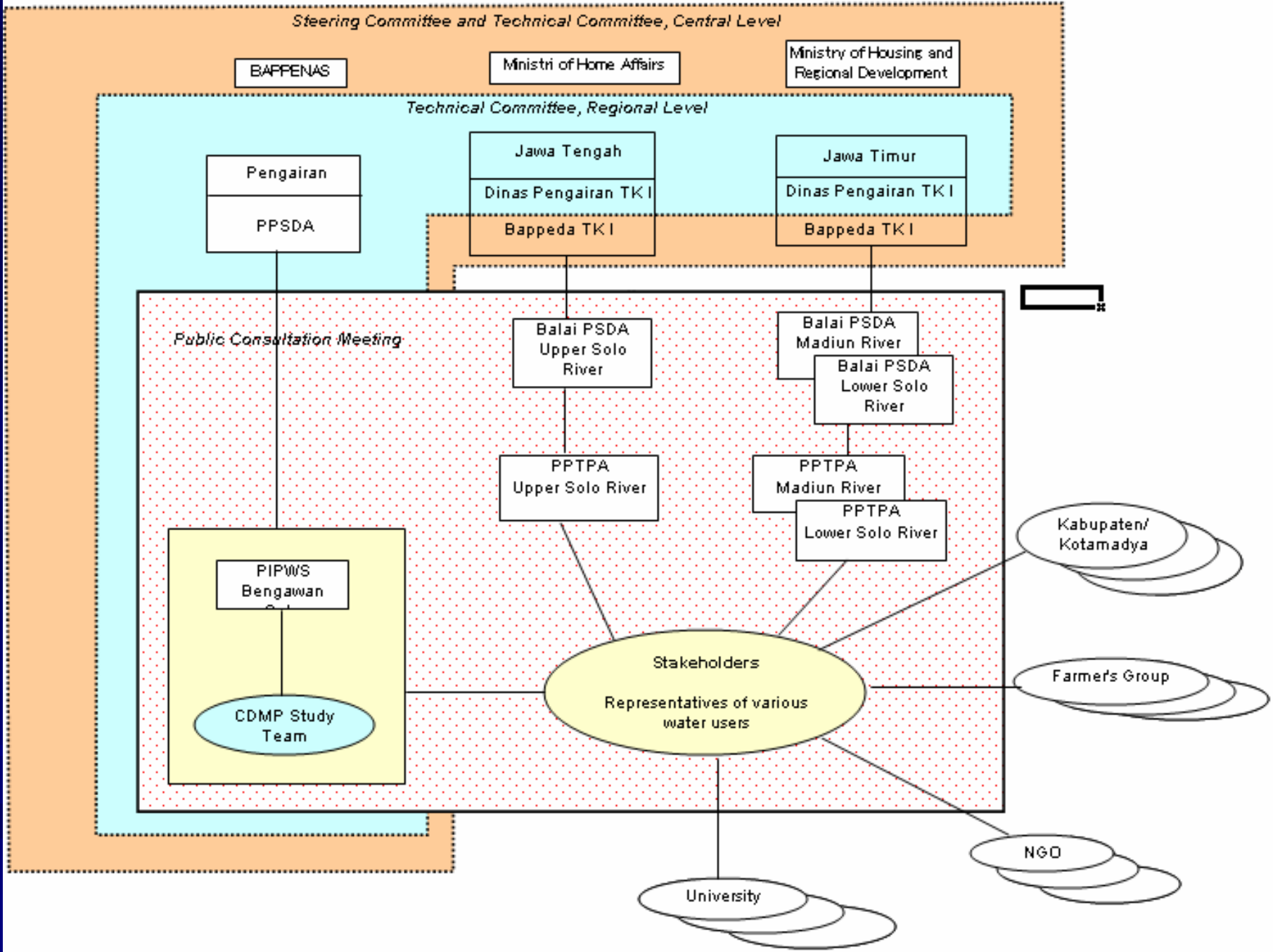
- The Master Plan was established taking into account local, regional and national needs and aspirations for water resources development and management based on a participatory “bottom-up” approach to involvement of stakeholders.

- In the early part of Phase I, the first basin-wide Public Consultation Meetings (PCMs) were held at the 3 selected locations within the basin in March 2000 to incorporate various opinions, constraints, proposals and aspirations in water resources development and management from communities and stakeholders into the master planning process.

In conclusion, five key issues can be identified as shown below.

- **Key Issue No.1: Water Resources Potential Distribution Gap**
- Key Issue No.2: Increasing Trend of Diversifying Water Demand and Clean Water Requirement
- **Key Issue No.3: Increasing Water Use Conflicts and Negative Phenomena among Basins/Communities/Use Sectors/Sub-Sectors.**
- **Key Issue No.4: Progressive Environmental Degradation in Less Developed Areas**
- **Key Issue No.5: Limited Development Potential due to Topographical and Geographical Constraints**

- The second PCMs were held at 3 locations within the basin late in September 2000. Highlight of second PCMs was to discuss with and obtain comments from the stakeholders on the suggested regional development scenario to the year 2025 (socio-economic macro-frame) and water resources development and management master plan targets as well as its plan components.



Organization Relashionship for CDMP Study Implementation

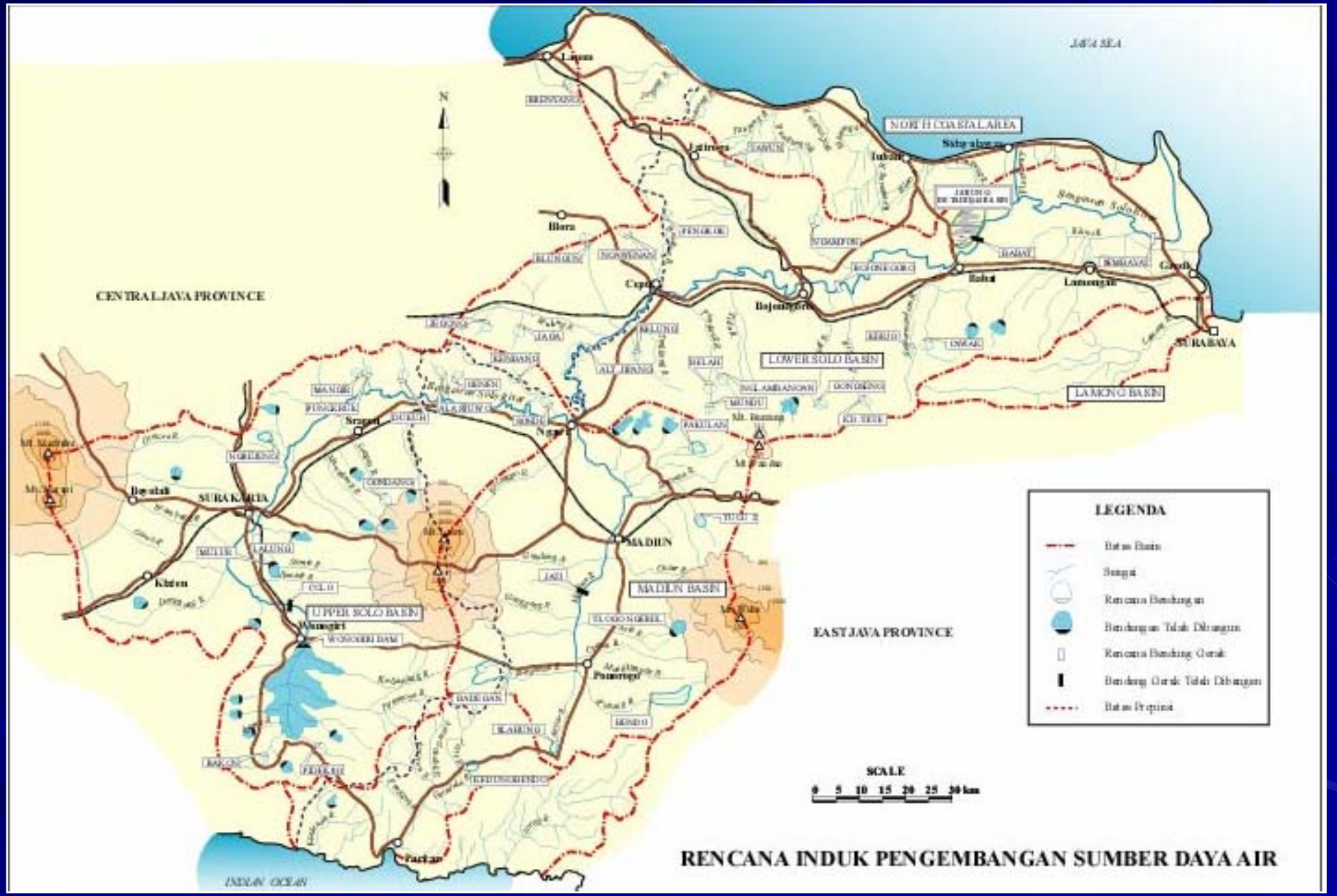
Master Plan Composition

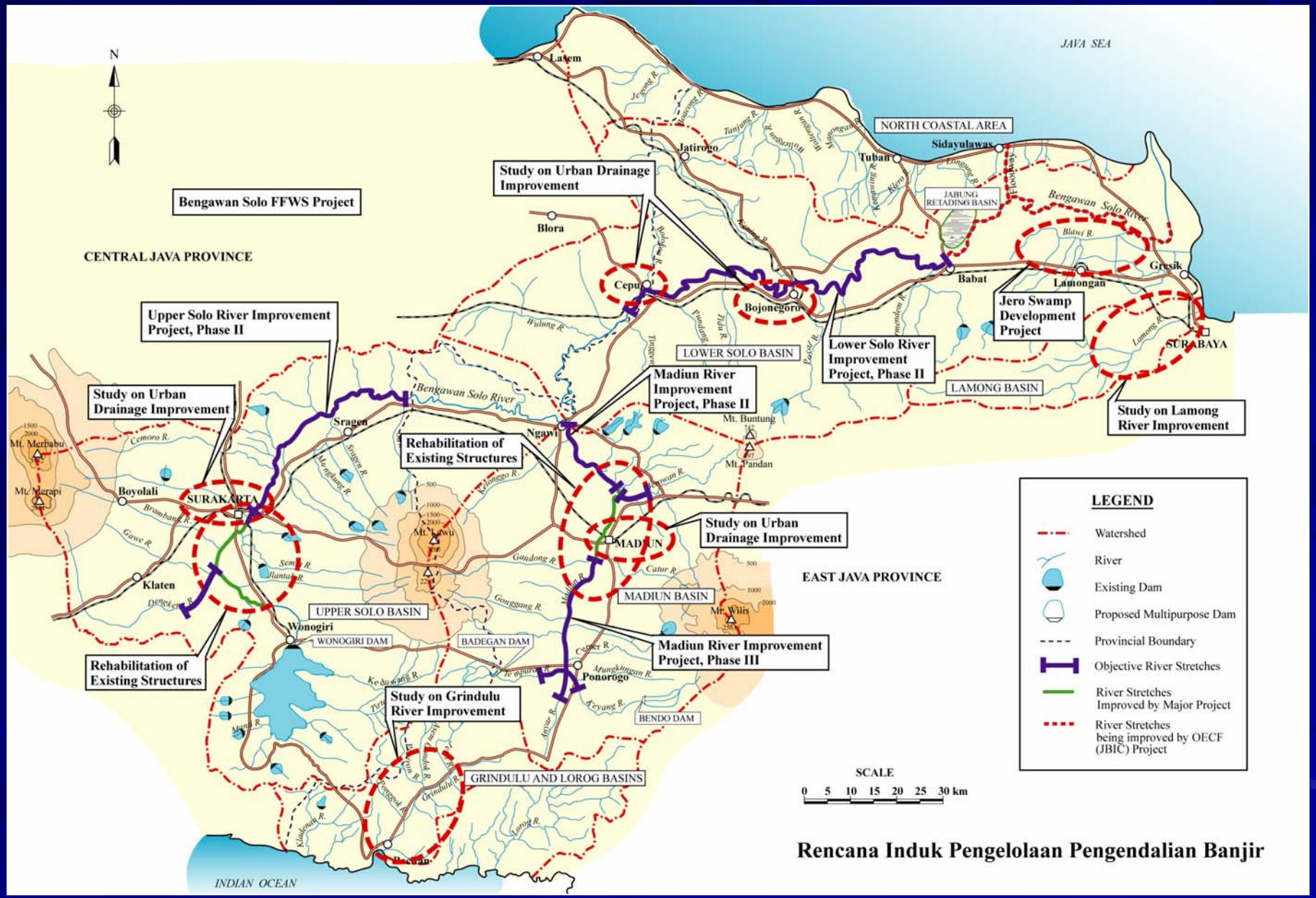
Plan Component	Name of Project
Component 1 : Promote Water Resources Development	
Domestic and Industrial Water Supply Plan:	
1	Lower Solo Long-Channel Storage Project
2	Greater Surakarta Water Supply Project
3	PDAM Water Supply System Development Project
4	Rembang Water Supply Project

Irrigation Development and Rehabilitation Plan:	
5	Solo Vallei Werken Project
6	Upper Solo Nine Tributary Irrigation Dams Project
7	Madiun Three Tributary Irrigation Dams Project
8	Lower Solo Sixteen Tributary Irrigation Dams Project
9	Kd. Bendo Irrigation Dam Project
10	Rehabilitation and Improvement Projects of Irrigation Systems
11	Bendo Multipurpose Dam Project
12	Badegan Multipurpose Dam Project
13	Pidekso Dam Project
14	Tlg. Ngebel Rehabilitation Project

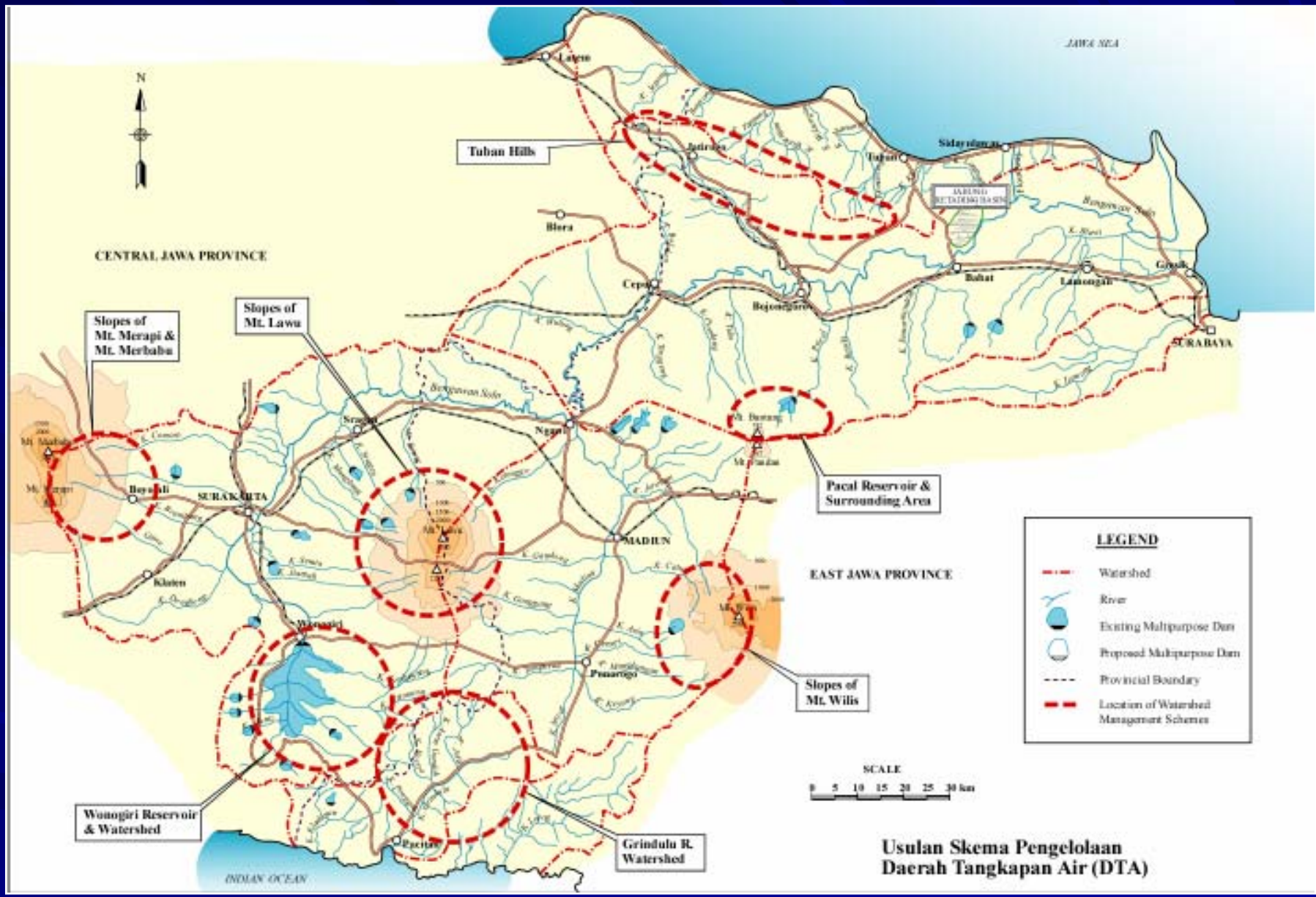
Component 2 : Strengthen Watershed Management	
Watershed Conservation and Management Plan:	
15	Urgent Countermeasure Project for Sedimentation in Wonogiri Reservoir
16	Wonogiri Reservoir Rehabilitation and Watershed Management Project
17	Critical Land Rehabilitation and Management Project in Six Watersheds
Component 3 : Strengthen Water Quality Management	
Water Quality Management Plan:	
18	Establishment of Water Quality Management Framework in the Bengawan Solo River Basin
19	Study of Enforcement of Effluent Discharge Standards in the Bengawan Solo River Basin

Component 4 : Strengthen Flood Control Management	
Flood Control Management Plan:	
20	Lower Solo River Improvement Project, Phase II
21	Upper Solo River Improvement Project, Phase II
22	Madiun River Improvement Project, Phase II and III
23	Study on Grindulu River Improvement
24	Study on Lamong River Improvement
25	Jero Swamp Development Project
26	Study on Urban Drainage Improvement
27	Rehabilitation of Existing River Structures
28	Bengawan Solo FFWS Project
Component 5 : Strengthen Institutional Framework of Water Resources Management	
***Strengthening and Improvement Plan of Institutional Framework* of Water Resources Management:**	
29	Institutional Capacity Building in Water Resources Management within the Bengawan Solo River Basin

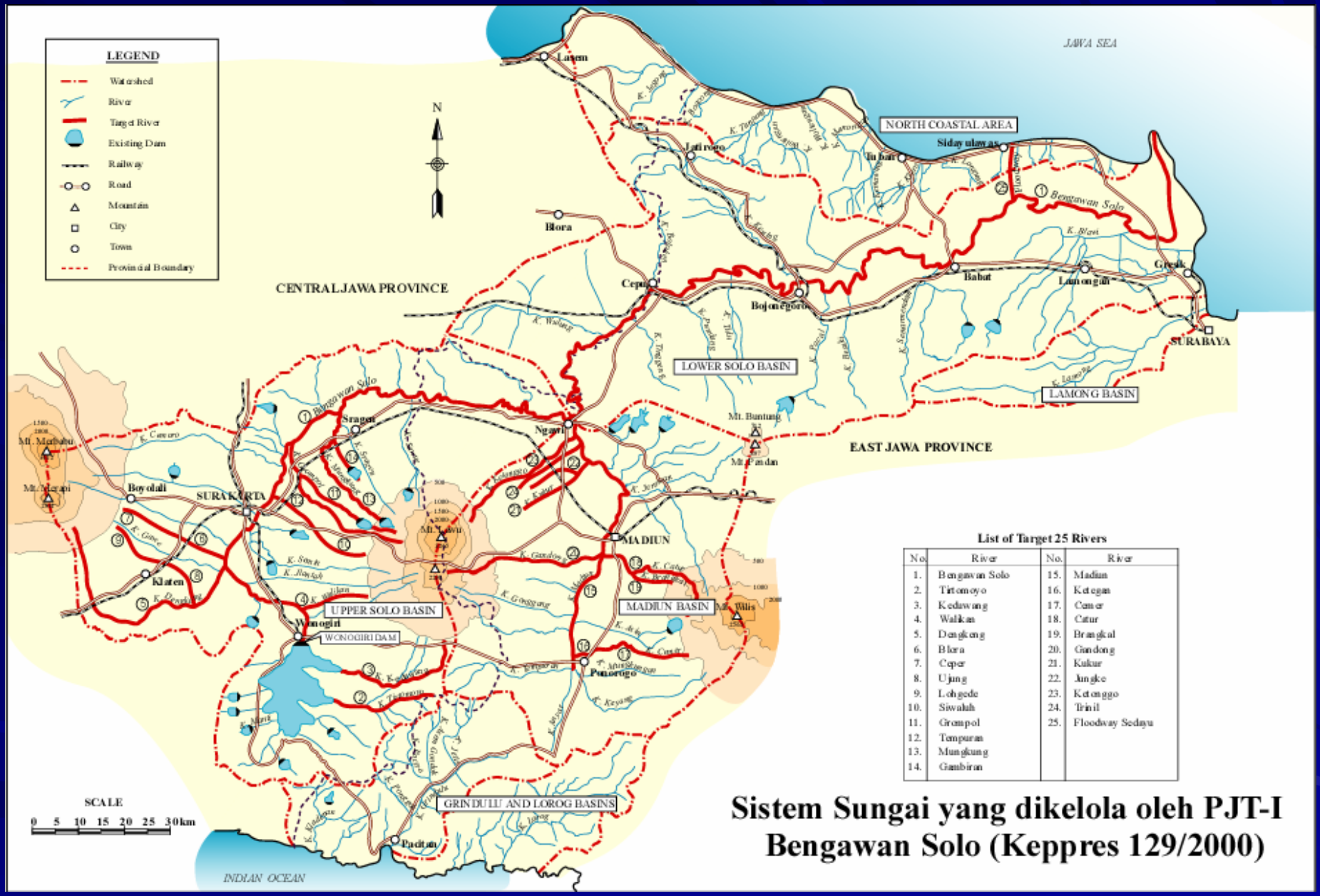

JAVA SEA
CENTRAL JAVA PROVINCE
EAST JAVA PROVINCE
INDIAN OCEAN
N
NORTH COASTAL AREA
LOWER SOLO BASIN
UPPER SOLO BASIN
MADIUN BASIN
LAMONGAN BASIN
Lasem
Blora
Cepu
Bojonegoro
Tuban
Lamongan
Gresik
SURABAYA
Sragen
Ngawi
SURAKARTA
Boyolali
Klaten
Wonogiri
MADIUN
Purwodadi
Pacitan
Mt. Merbabu
Mt. Merapi
Mt. Lawu
Mt. Wilis
Mt. Pandan
Mt. Kendeng
LEGENDA
Batas Basin
Sungai
Rencana Bendungan
Bendungan Telah Dibangun
Rencana Bending Gerak
Bending Gerak Telah Dibangun
Batas Propinsi
SCALE
0 5 10 15 20 25 30 km
RENCANA INDUK PENGEMBANGAN SUMBER DAYA AIR



Rencana Induk Pengelolaan Pengendalian Banjir



Usulan Skema Pengelolaan Daerah Tangkapan Air (DTA)



List of Target 25 Rivers

No.	River	No.	River
1.	Bengawan Solo	15.	Madiun
2.	Tirtomoyo	16.	Ketegan
3.	Kedawang	17.	Cemer
4.	Walikan	18.	Catur
5.	Dengkeng	19.	Brangkal
6.	Blora	20.	Gandong
7.	Ceper	21.	Kukur
8.	Ujung	22.	Jungke
9.	Lohgede	23.	Ketenggo
10.	Siwaluh	24.	Trinil
11.	Grompol	25.	Floodway Sedayu
12.	Tempuran		
13.	Mungkung		
14.	Gambiran		

Sistem Sungai yang dikelola oleh PJT-I
Bengawan Solo (Keppres 129/2000)

PEMERINTAH PROPINSI JAWA TENGAH
DAN
PEMERINTAH PROPINSI JAWA TIMUR

RENCANA INDUK (2001)
PENGEMBANGAN DAN PENGELOLAAN SUMBERDAYA AIR
SATUAN WILAYAH SUNGAI BENGAWAN SOLO

RENCANA INDUK INI TELAH DIDISKUSIKAN BERSAMA DALAM FORUM PENGARAH STUDI KOMPREHENSIF RENCANA INDUK PENGEMBANGAN DAN PENGELOLAAN SUMBERDAYA AIR SWS BENGAWAN SOLO, PROPINSI JAWA TENGAH DAN PROPINSI JAWA TIMUR

Surabaya, 18 Juni 2002

Mengetahui / Mengesahkan :
An. GUBERNUR JAWA TENGAH
Kepala BAPPEDA,

BAPPEDA

Prof. Dr. MIYASTO
Pembina Utama Muda
NIP. 130516585

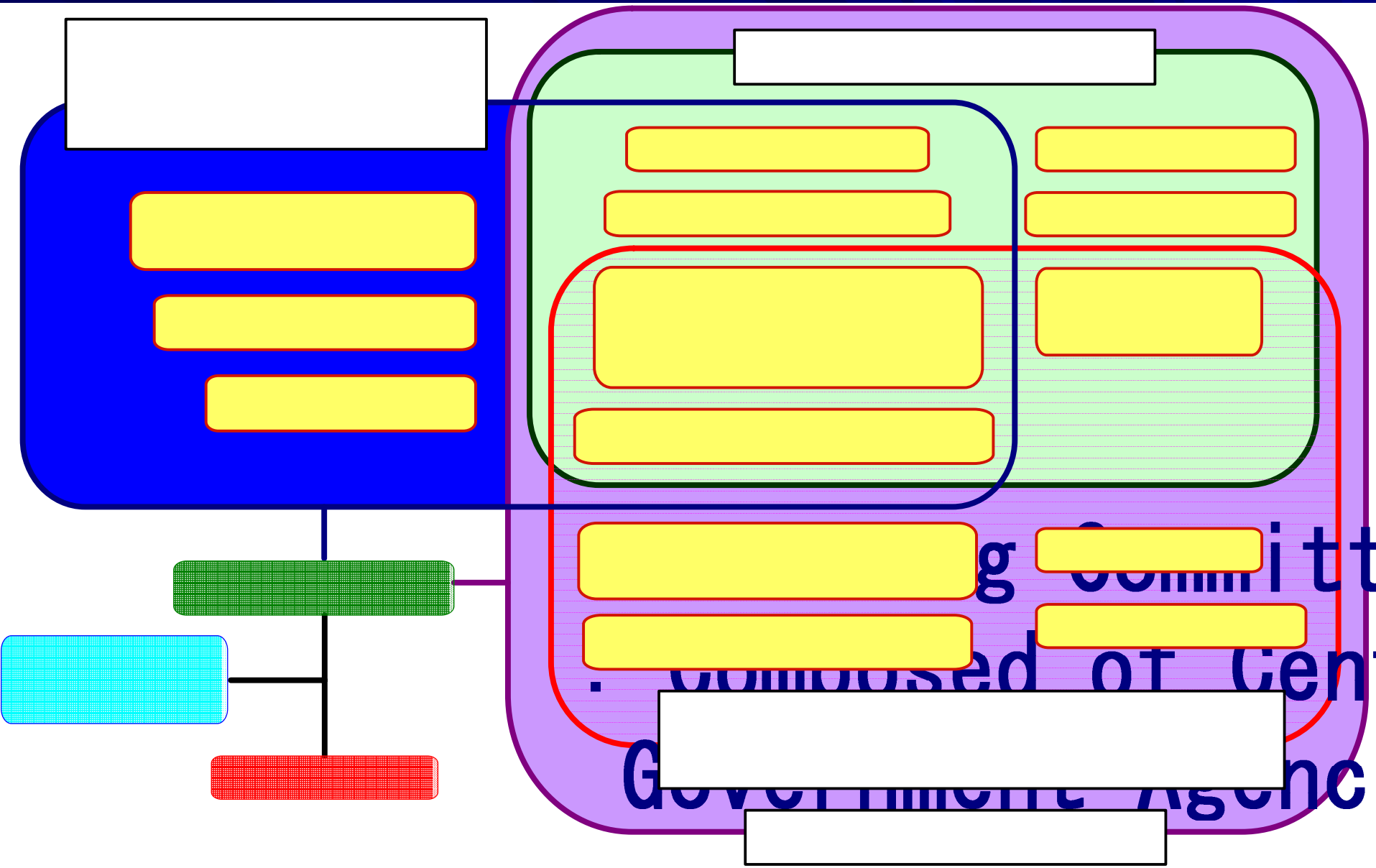
Mengetahui / Mengesahkan :
An. GUBERNUR JAWA TIMUR
Kepala BAPPEPROP,

PEMERINTAH PROPINSI
BAPPEPROP

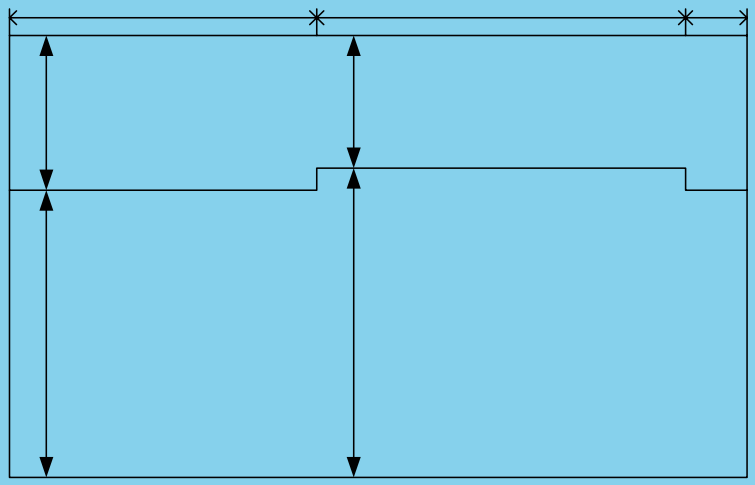
Drs. SAPARI RANUWIDJAJA, M.Sc.
Pembina Utama Madya
NIP. 010082718

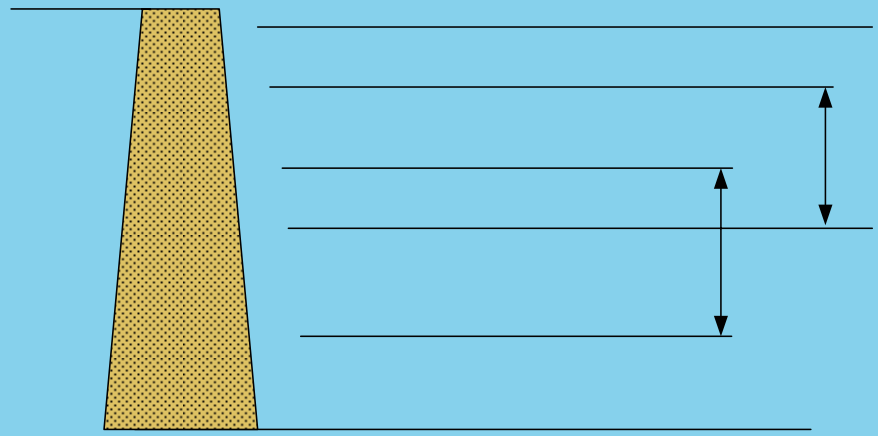
The Study on Countermeasures for Sedimentation in the Wonogiri Multipurpose Dam Reservoir

Related Institution in the Study



- The Wonogiri Multipurpose Dam is the sole large reservoir in the mainstream of the Bengawan Solo River, aiming at flood control, irrigation water supply and hydropower generation.
- The Wonogiri Dam was constructed in 1982 under the technical cooperation of OTCA (the former JICA) and financial assistance of OECF (the former JBIC).
- Reservoir, it would lose its functions such as water supply, flood control because of decrease of the storage capacity in the near future





Flood

No

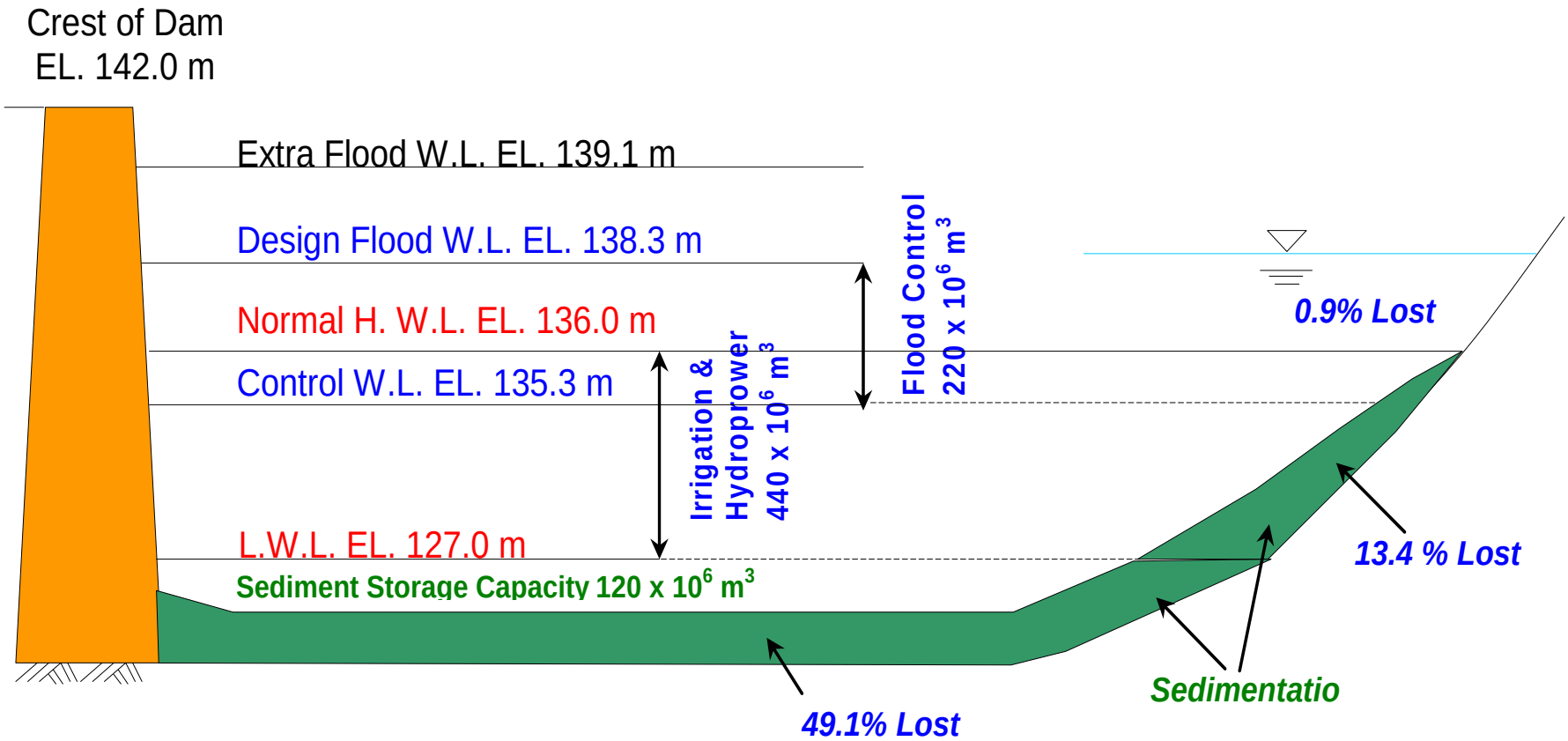
Flood Control

$220 \times 10^6 \ m^3$

Floc

175

Sedimentasi Waduk Serbaguna Wonogiri pada th 2005



Kapasitas Tampungan-Efektif : ➡ ***375 juta m3 pada th 2005***

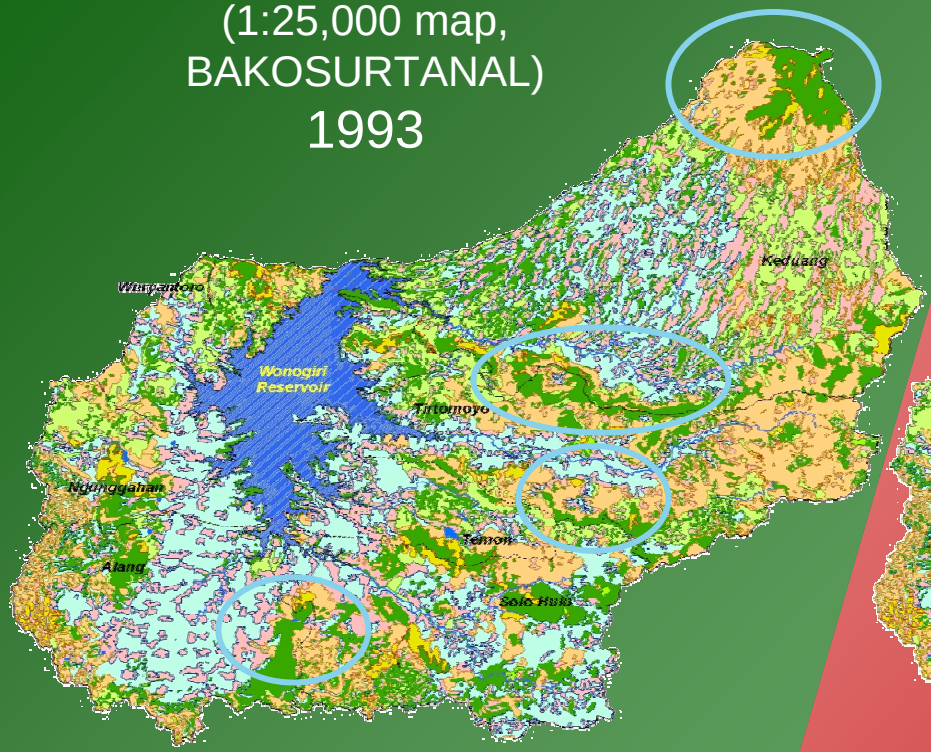
440 juta m3 pada th 1980

Inflow Sedimen Rata-2 (1980-2005): 4,6 juta m3/tahun

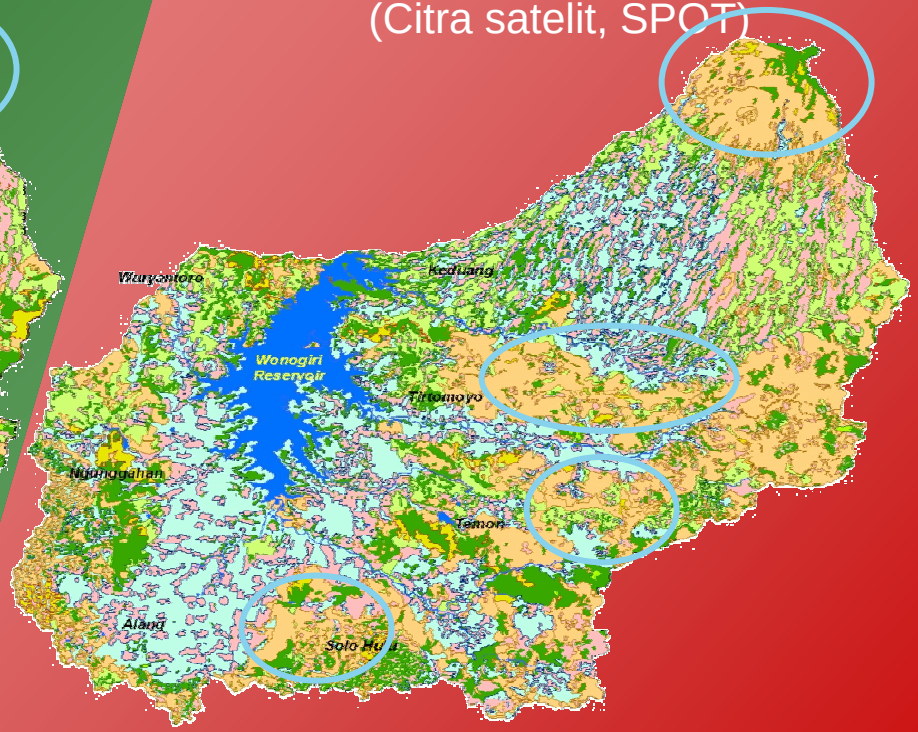
Watershed Conservation and Management

Land use Changes

Peta DRBI I-2001
(1:25,000 map,
BAKOSURTANAL)
1993

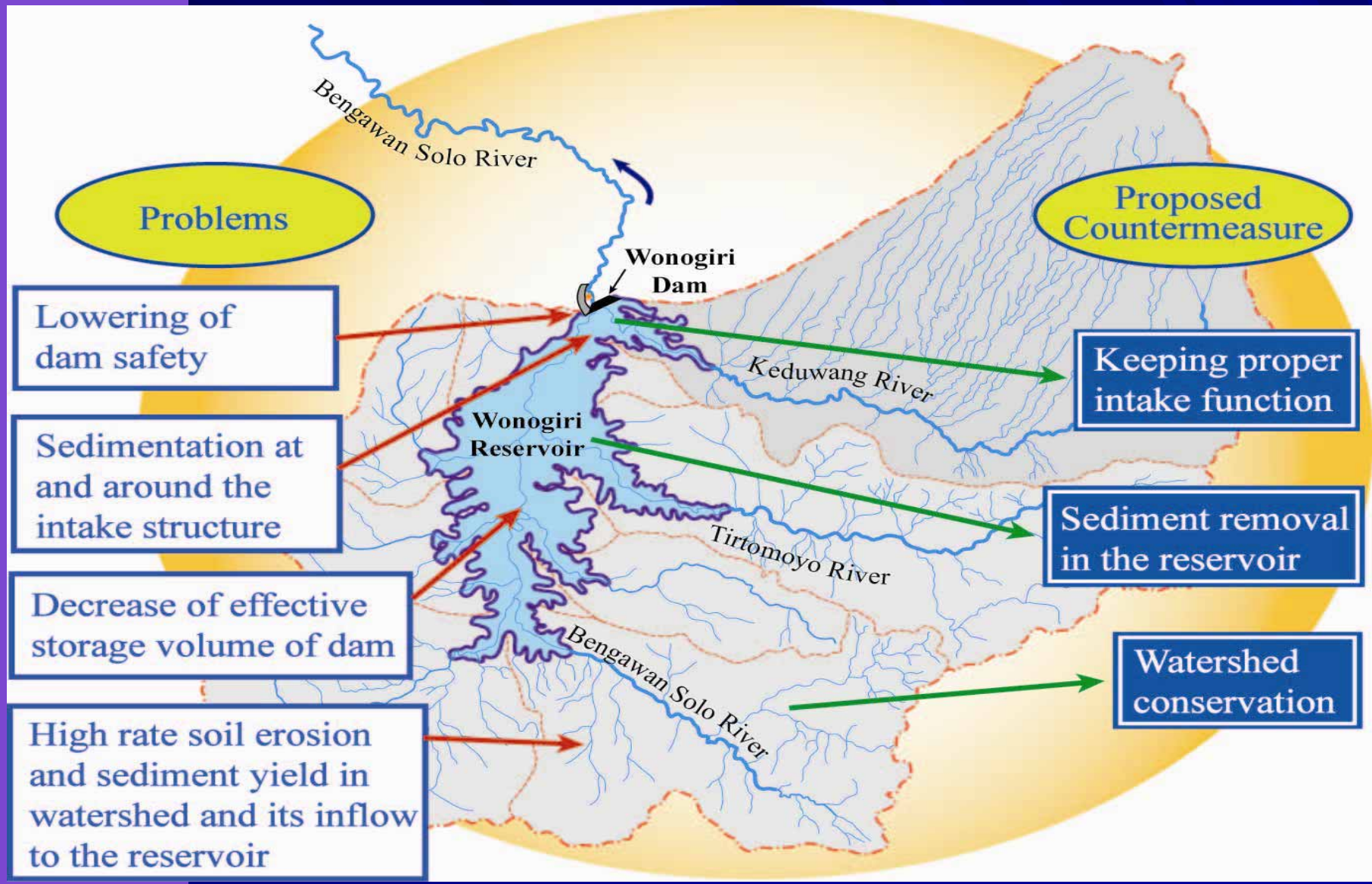


2003
(Citra satelit, SPOT)



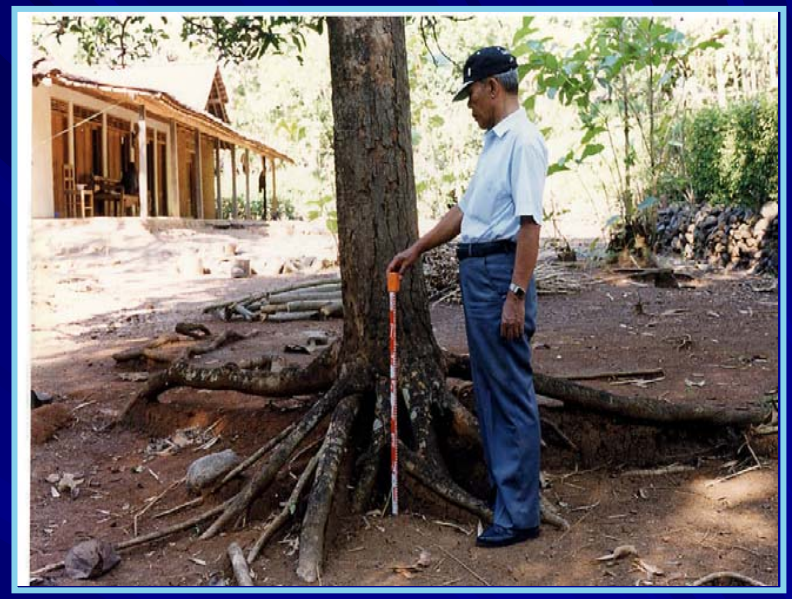
Forest in the high slope area decrease !!

Countermeasure of sedimentation Scheme



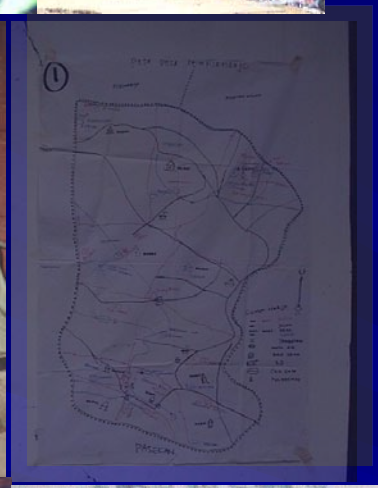
Garbage from K. Keduang

Garbage Problems at Intake

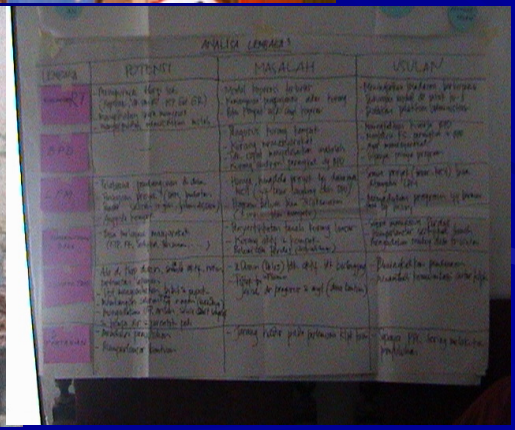


Village Land Conservation Plan

- Persepsi is a NGO who appointed by JICA Study Team for facilitating community participation in the planning process by Participatory Rural Approach (PRA) process


PASCAN


BALAI DESA


ANALISA (EMBACE)
POTENSI
MASALAH
USULAN

General Problem

1. Economic Sector
2. Institutional Sector
3. Social and Politic Sectors

Erosion Problems

1. Rill /Sheet Erosion
2. Bank Erosion
3. Gully Erosion
4. Land Sliding Erosion

The Important Factors for Village Soil Conservation Efforts

1. **Supporting Factors**
   - The availability of vegetation for conservation that grows and develop and well managed by the community.
   - The cattle effort managed by the farmers at domestic scale that enable to motivate the slopping grassing in land terraces.
   - The experiences of basic conservation techniques to handle the village conservation works.
   - The availability of local workers that ready to use in the implementation of soil conservation action plan.

The Important Factors for Village Soil Conservation Efforts

2. *Barriers or Obstacles Factors*

- Low surplus of community's income that allocable for village conservation aims.
- Low capacity of conservational groups to handle and implement integrated planning combined the conservational aspect and economic income generating one in the village.
- Incompatible policies on management of state forest and community one.
- Strong understanding that land conservation are Government issue, not community one.

National Friendship Movement on Water Safety Guard (*Gerakan Nasional Kemitraan Penyelamatan Air – GN-KPA)*

- GNKPA established on March 22, 2005.
- GNKPA is a national movement aiming to revitalize the balancing of hydrological cycles in the watershed.

- GNKPA level are central, provincial, district. The member of each level are from all stakeholder who in charge in water safety, both government and non government. The activities of GNKPA are facilitating GNKPA establishment, facilitating community development, facilitating planning and implementation, technical assistance in the watershed conservation and management toward water safety guard

Thanks you very much