JOINT COOPERATION PROGRAMME

Component B: Water resources management planning and Integrated Water Resources Management (IWRM) tools

Document B1.2

PPP Results *Einlanden-Digul-Bikuma basin IWRM case study*

Jakarta

18 October 2012

Project: 1201430.000

Client: Water Mondiaal
Partners for Water
Royal Netherlands Embassy in Jakarta

Period: January 2011 – March 2013

Koninklijk Nederlands Meteorologisch Instituut
Ministerie van Verkeer en Waterstaat

Deltares
Enabling Delta Life

Joint Cooperation Project (JCP)
Component B

Integrated Water Resources Management WS Einlanden - Digul - Bikuma

Final results, conclusions and recommendations

Jakarta
October 18, 2012

Component B

- WHO RTC
- Support for revision Pola EDB
  - Hydrological analysis assessment using global data sets for data poor areas
  - Workshops for capacity building
  - Demonstration of IWRM concept

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Workshops

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Data analysis

Few measurement data available

→Use of remote sensing and other global data sets:

- Land use
- Topography
- Soils
- Rain
- Evaporation

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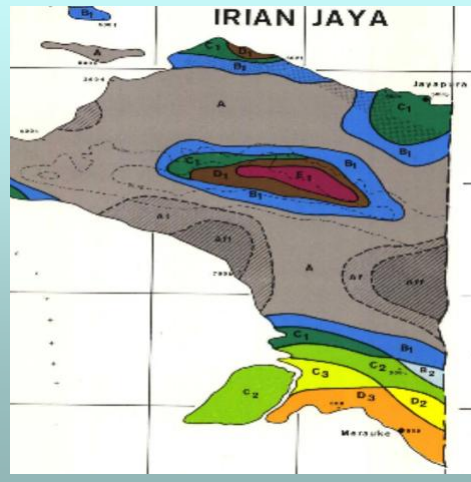
Oldeman climate classification



Zone	Wet	Dry
A	>9	<2
B1	7-9	<2
B2	7-9	2-3
C1	5-6	<2
C2	5-6	2-3
C3	5-6	4-6
D1	3-4	<2
D2	3-4	2-3
D3	3-4	4-6
E1	<3	<2

f: 2-4 consecutive months with P>400 mm/month

ff: >4 consecutive months with P>400 mm/month

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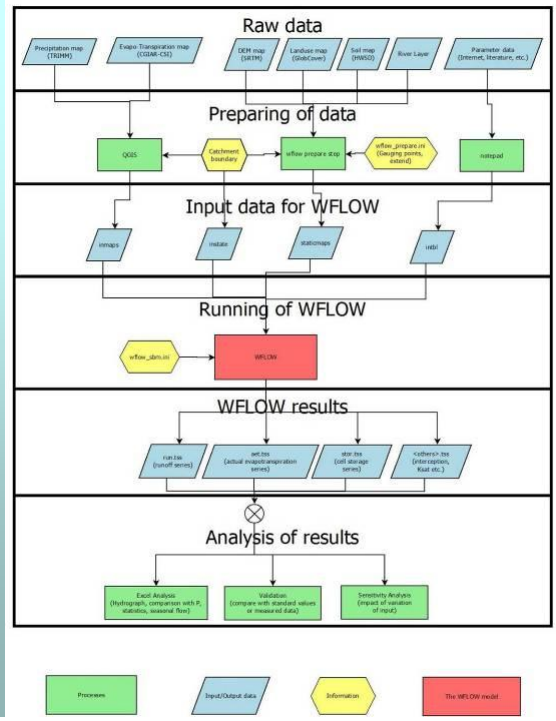

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Global data sets

- TRMM Precipitation
- CSI-CGIAR Potential evapotranspiration
- Topography SRTM
- Land use GlobCover (CRISP)
- Soils FAO-IIASA Harmonized World Soil Database

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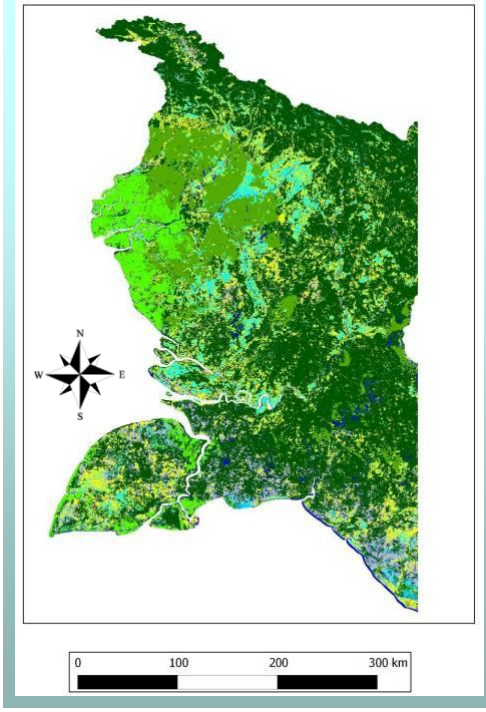

Landuse

- Irrigated croplands
- Rainfed croplands
- Cropland
- Vegetation
- Forest
- Shrubland
- Forest regularly flooded
- Forest or shrubland permanently flooded
- Artificial surfaces
- Water bodies

Source	GlobCover
Webpage	http://ionia1.esrin.esa.int/
Resolution	Cells of 300 by 300 m
Version	2.3 2009 (V2.3)

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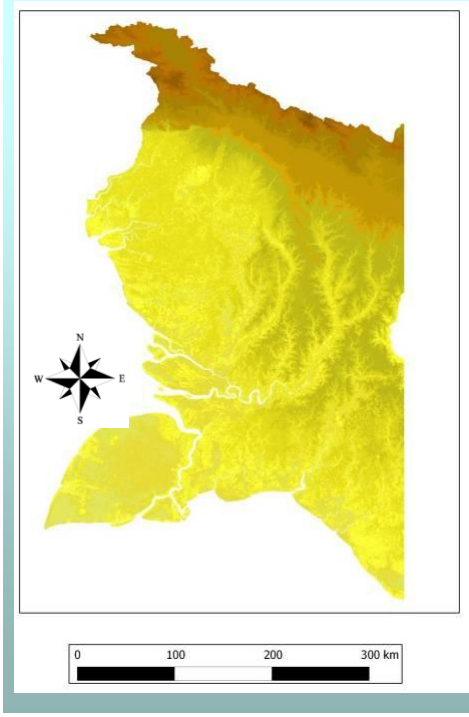
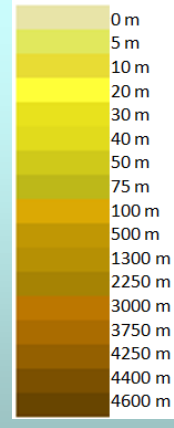


Topography



Source	Shuttle Radar Topography Missions (SRTM)
Webpage	http://dds.cr.usgs.gov/srtm/
Resolution	Cells of 90 by 90 m
Version	1999

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Automatic catchment delinieation

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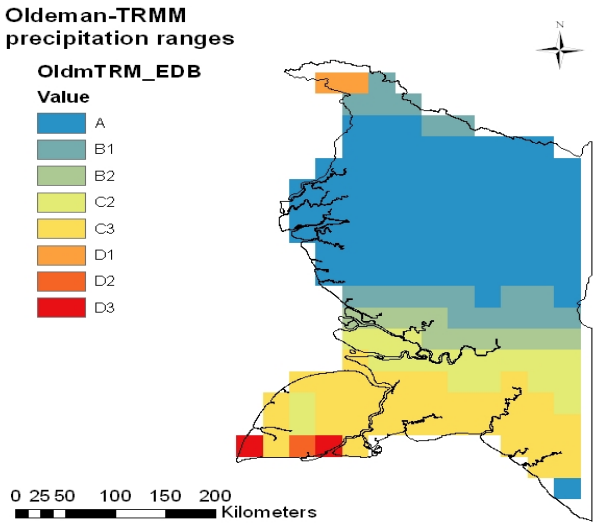
Oldeman on TRMM 2002-2012



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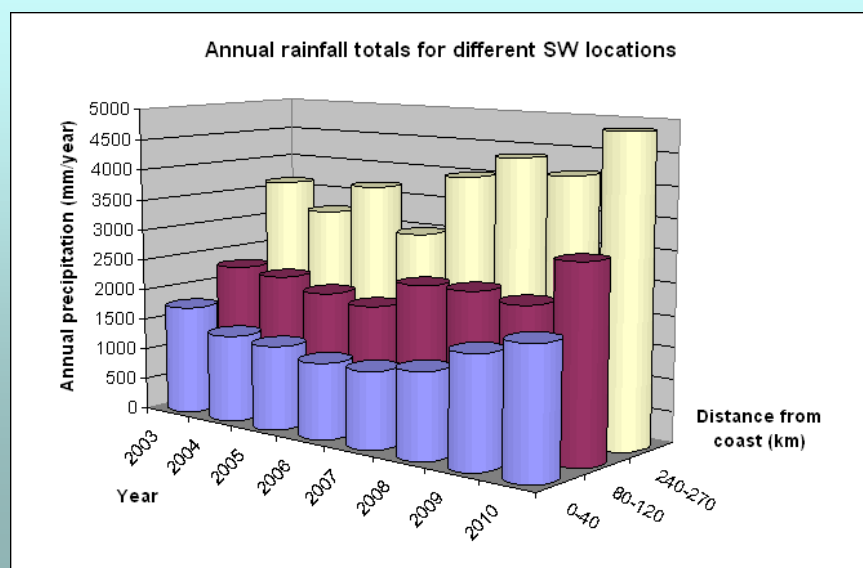
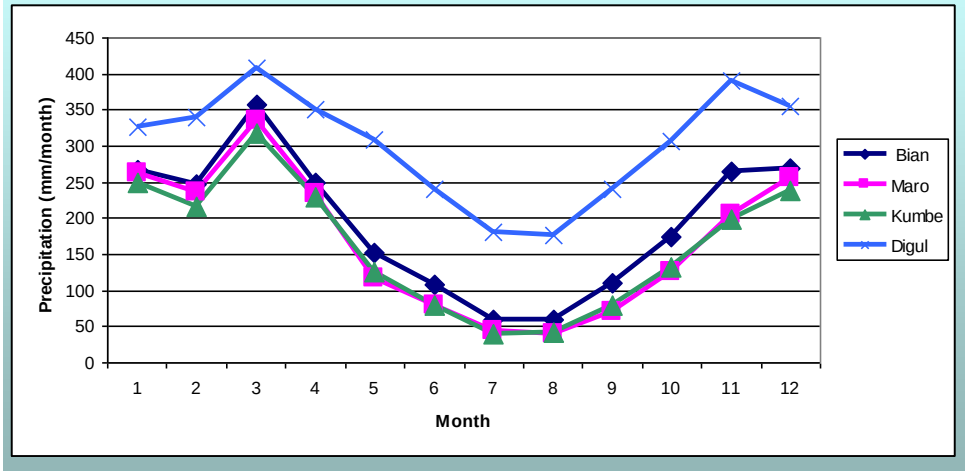
D3	3-4	4-6

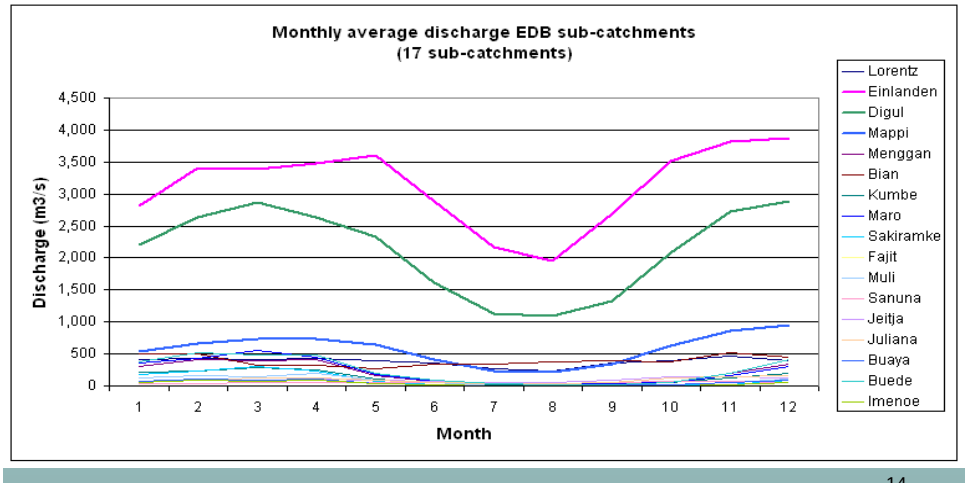
Annual & spatial variation in rainfall



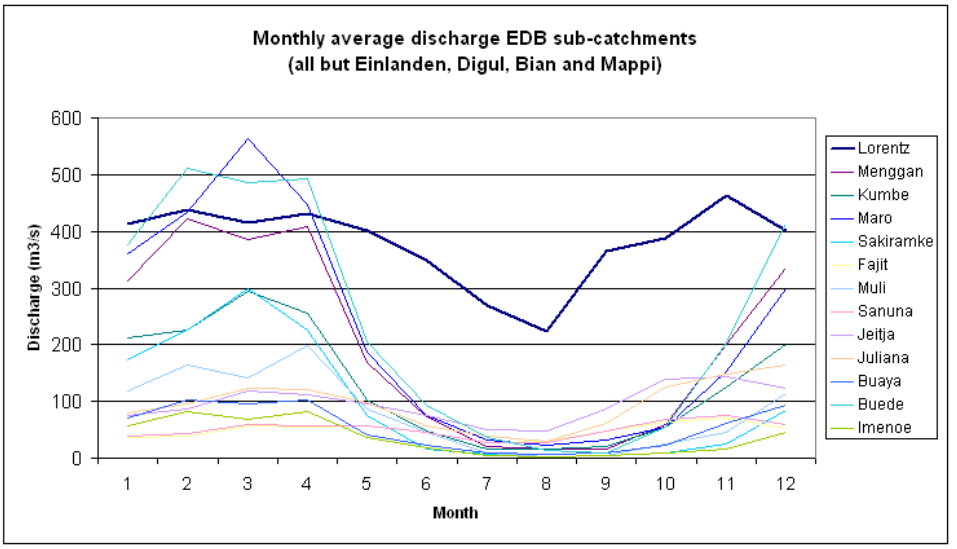
Average rainfall over the year



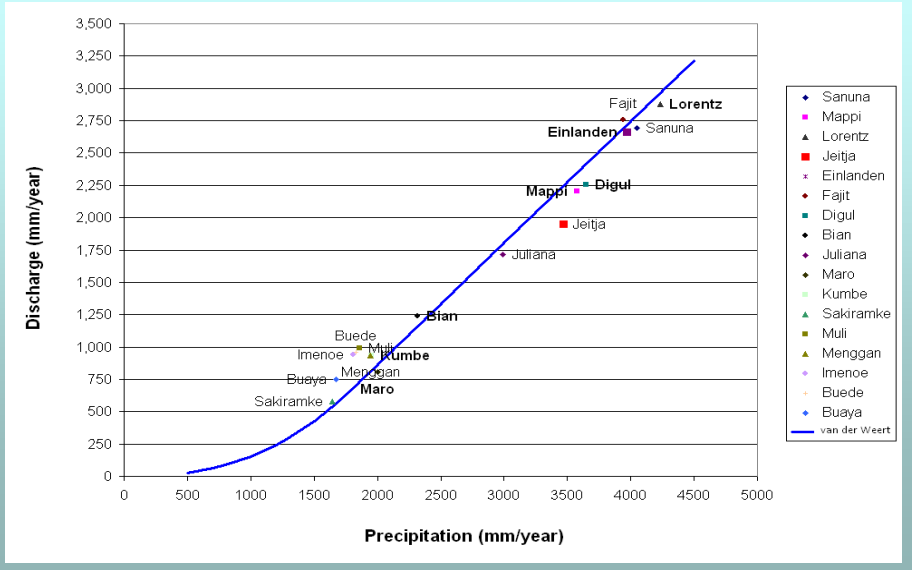
Average run-off over the year



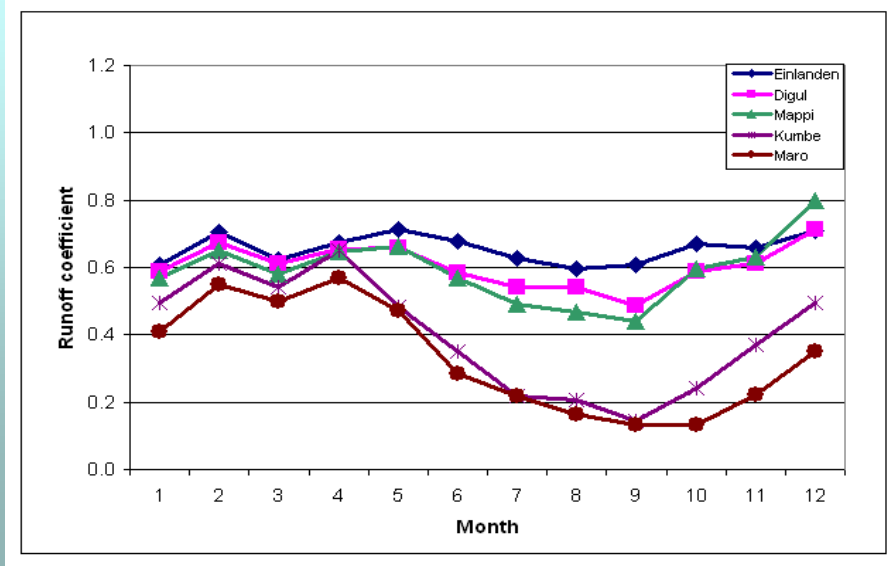
Average run-off over the year



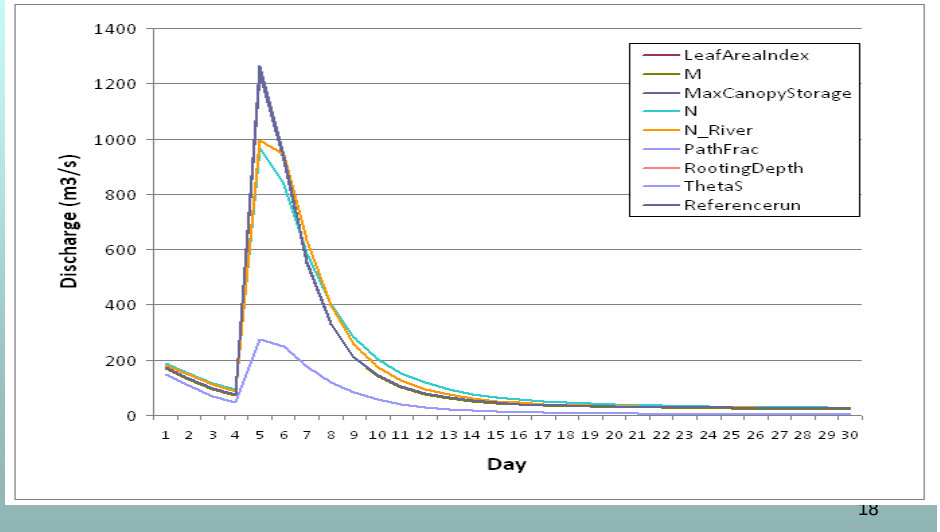
No-nonsense calibration



Monthly run-off coefficient



Sensitivity analysis



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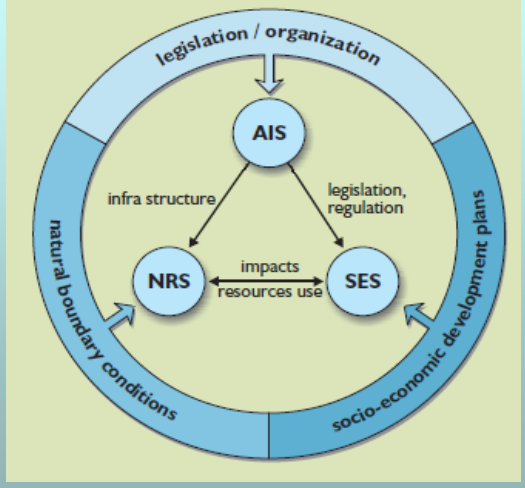
IWRM



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Current water demand

- Domestic
- Irrigation

Implementation of MIFEE would increase water demand enormously

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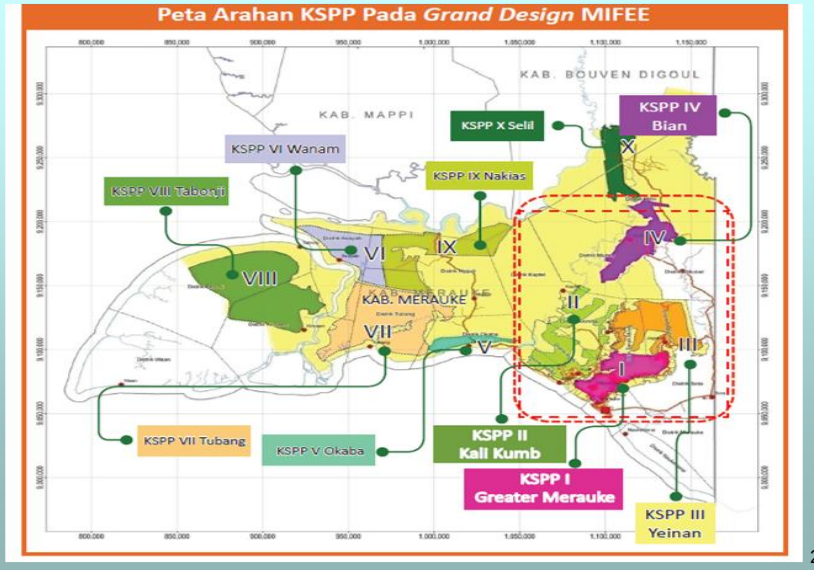
MIFEE



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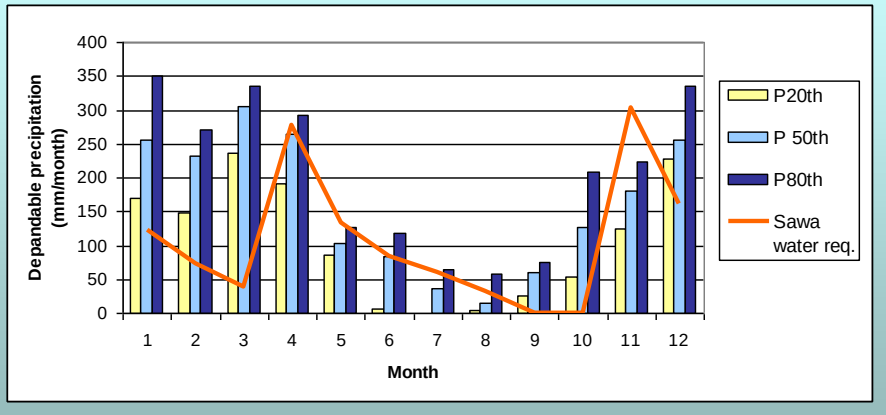
Water requirement for paddy



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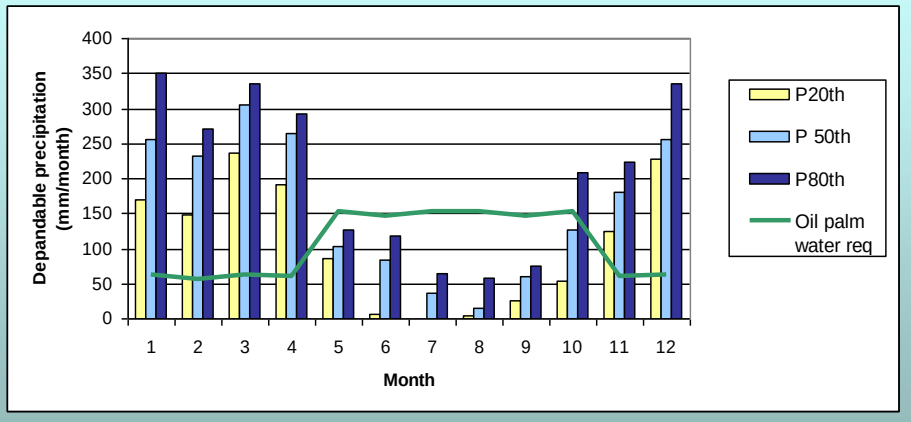
Water requirement oil palm



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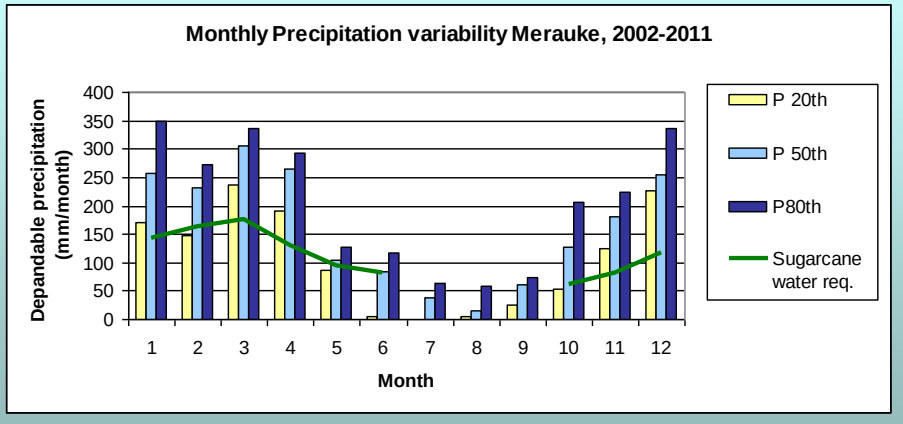
Water requirement sugar cane



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Scenario analysis

- Current situation
- Autonomous development
- MIFEE 1.2 Mha
- MIFEE 250.000 ha
- Focus on sustainability

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Criteria

Social Aspects

1. equity and social inclusion

2. preservation of cultural integrity and values of indigenous people

Economic Aspects

3. level of economic growth

4. poverty alleviation

5. financial feasibility of the intervention

Environmental Aspects

6. sustainable resources use

7. conservation of ecosystem services

8. climate change mitigation

Technical Aspects

9. water availability

10. water quality

11. technical, feasibility of the intervention

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Multi-criteria analysis

Criteria	MIFEE 1.2M ha	MIFEE 250,000 ha	Focus on Sustainability	Autonomous developments
1. Equity and social inclusion	-2	-2	1	-1
2. Preservation of cultural integrity and values of indigenous people	-2	-2	2	-1
3. Level of economic growth	2	2	0	0
4. Poverty alleviation	1	1	2	0
5. Financial feasibility of the intervention	-2	-1	1	0
6. Sustainable resources use	-2	-1	2	0
7. Conservation of ecosystem services	-2	-1	2	0
8. Climate change mitigation	-2	-1	2	0
9. Water availability	-2	-2	0	-1
10. Water quality	-2	-1	0	-1
11. Technical feasibility of the intervention	0	0	1	1

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Review of Pola by PT Genta Prima Pertiwi

- Very general, academic text
- Focus on description
- Little attention for local issues
- No attention for future developments like MIFEE
- Not really a ‘strategic plan’

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Conclusions

- Global data sets and hydrological model can provide data on water availability, where measurements are scarce
- Staff of PusAir trained to use global data sets
- IWRM based river basin planning using scenario analysis with broad spectrum of criteria allows comparison of impacts
- No current big issues on water availability in EDB (saline groundwater and sustainable use Rawa Biru)

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Conclusions

- Without irrigation oil palm in Merauke will experience severe yield reduction in most years due to water shortage
- Large scale rice and oil palm cultivation as foreseen under MIFEE cannot be supported sustainably by the water system
- MIFEE might generate economic growth
- Not clear how productive oil palm will be
- MIFEE will have negative impact on social and environmental criteria (massive migration and deforestation)

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Recommendations

- Initiate hydrological monitoring
- Monitor Rawa Biru to prevent over-abstraction
- MIFEE should be analysed as an alternative in Pola
- Start multi-year experimental oil palm plantation
- Investigate extent of peat land and do not develop on deep peat
- Execute a multi-criteria analysis with stakeholders
- Enhance coordination between governmental bodies and also with other actors

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Recommendations

- Provide clear guidelines to consultants preparing Pola to focus Pola on local issues and future developments in water management
- Report, methods, data and results will be made available to BWS Papua and consultant

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