Land Demand and Land Potential of Central Java in 2030: a Forecast to Promote More Balanced Development Policy

By

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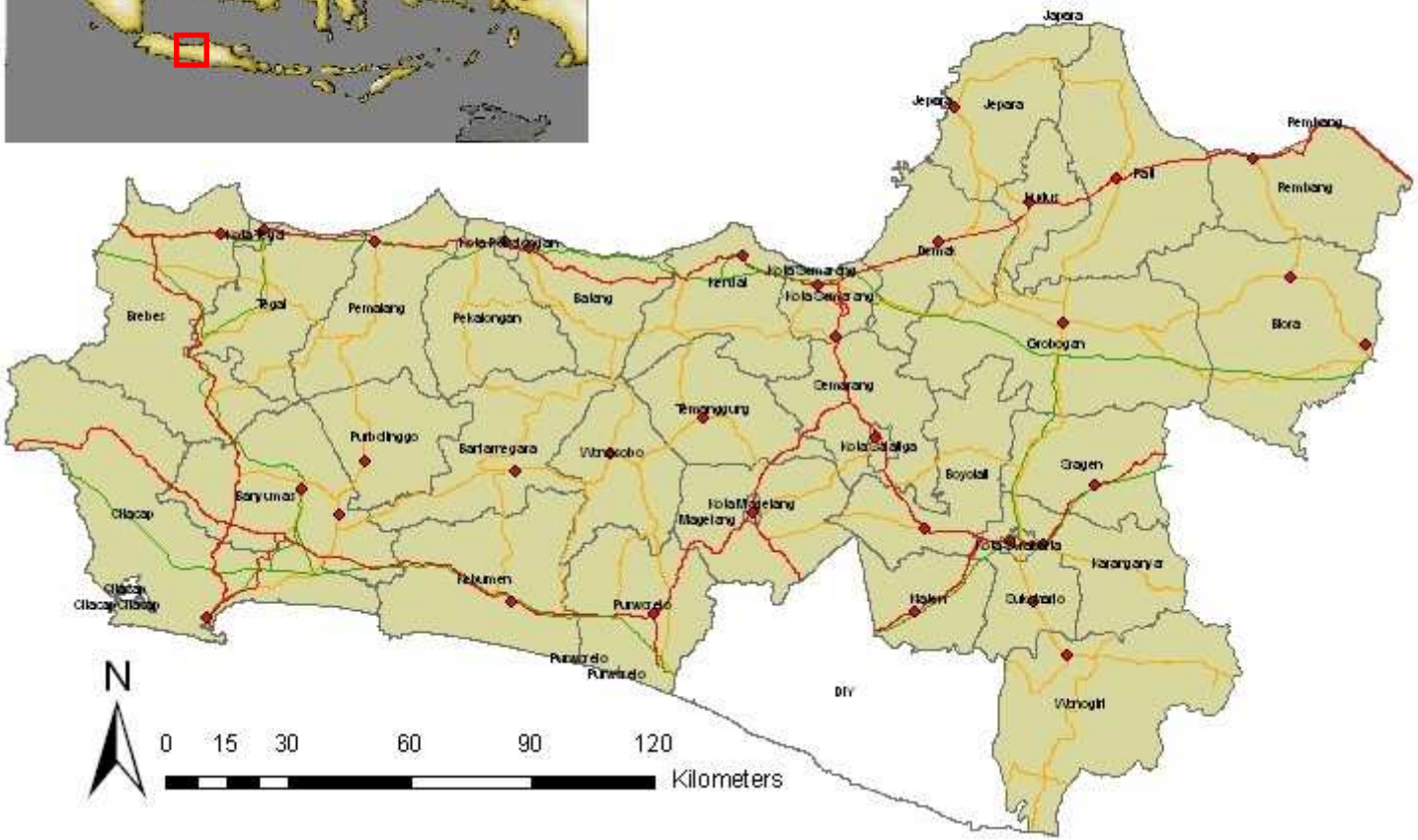
CENTRAL JAVA - INDONESIA

Area: 32.548,2 Km2
Population: 32.177.730 (2006)



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OUTLINE

- Introduction
- Land demand and land potential analyses
  - Land demand: number of population growth and land use coefficient calculation
  - Land potential: probability of transferability calculation
  - Land demand vs. Land potential
- Course to balanced development: a brief policy review
- Conclusion

Introduction

- Land allocation issues : land demand vs. land supply
  As our planet doet not growth but it should be developed over time.

- There are problems in many developing countries including Indonesia – Central Java:
  - Disparity
  - Primate cities
  - Food security
  - Environmental balances

- The paper aims to assess the land demand and the land potential of Central Java based on trend in 1994-2006 to forecast the situation of 2030, for further propose policy review to promote balanced development.

Land Demand:
Number of Population Growth (in district level)

Two scenarios applied

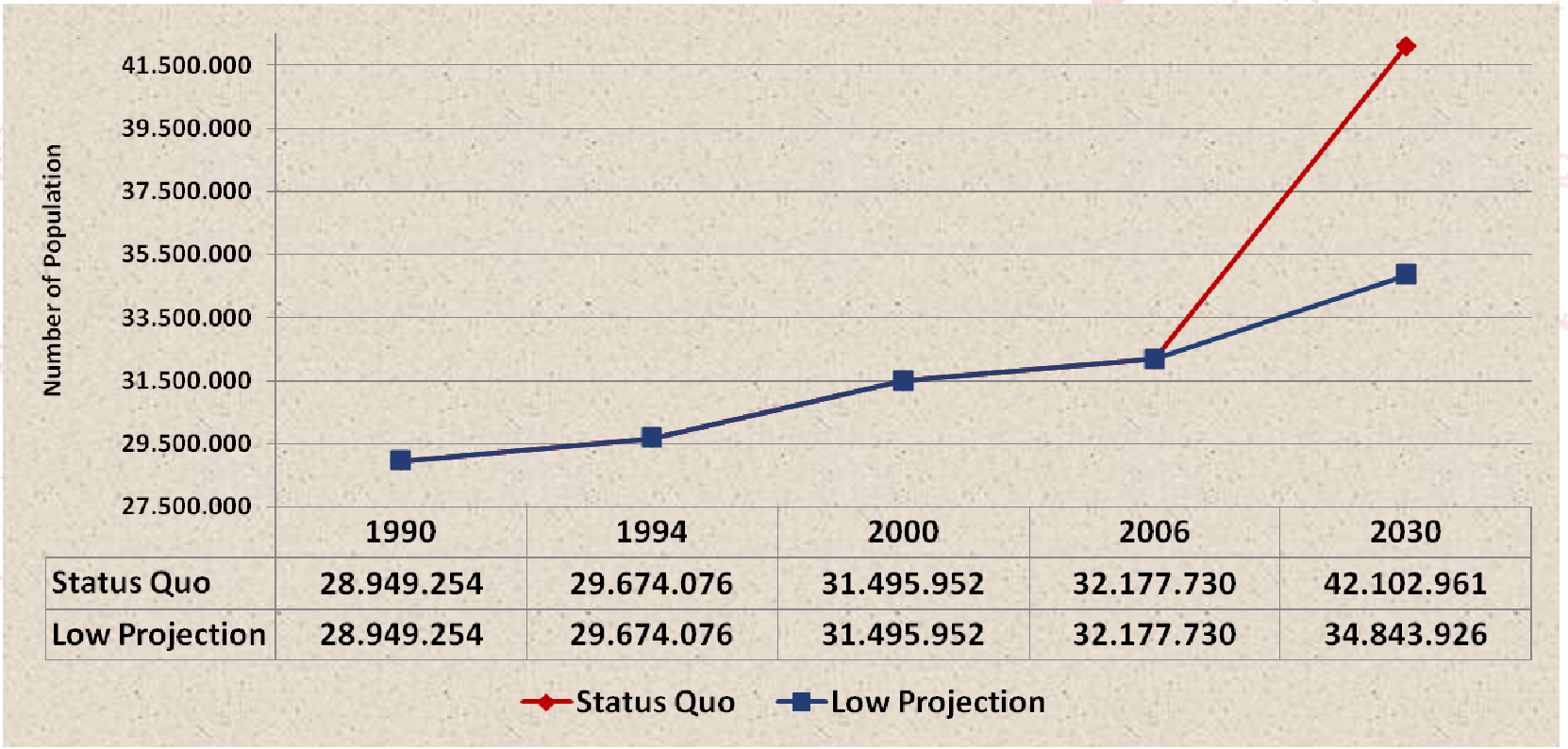
- **Status Quo Scenario**

  grotwh rate (r) based on 1990 and 2000 population censuses with geometric formula.

- **Low Projection Scenario**

  as Central Java population growth rate has been declining in the lowest rate compared to other provinces.

Land Demand:
Number of Population Growth



	1990	1994	2000	2006	2030
Status Quo	28.949.254	29.674.076	31.495.952	32.177.730	42.102.961
Low Projection	28.949.254	29.674.076	31.495.952	32.177.730	34.843.926

Population Projection for Central Java, 2030: Status Quo and Low Projection Scenario

Source: CBS and calculation result

Land Demand:
Land Coefficient Formula

$$\mu = \frac{(L2 - L1)}{(Pop2 - Pop1)}$$

Where:

L2 = Built-up area 2006

L1 = Built-up area 1994

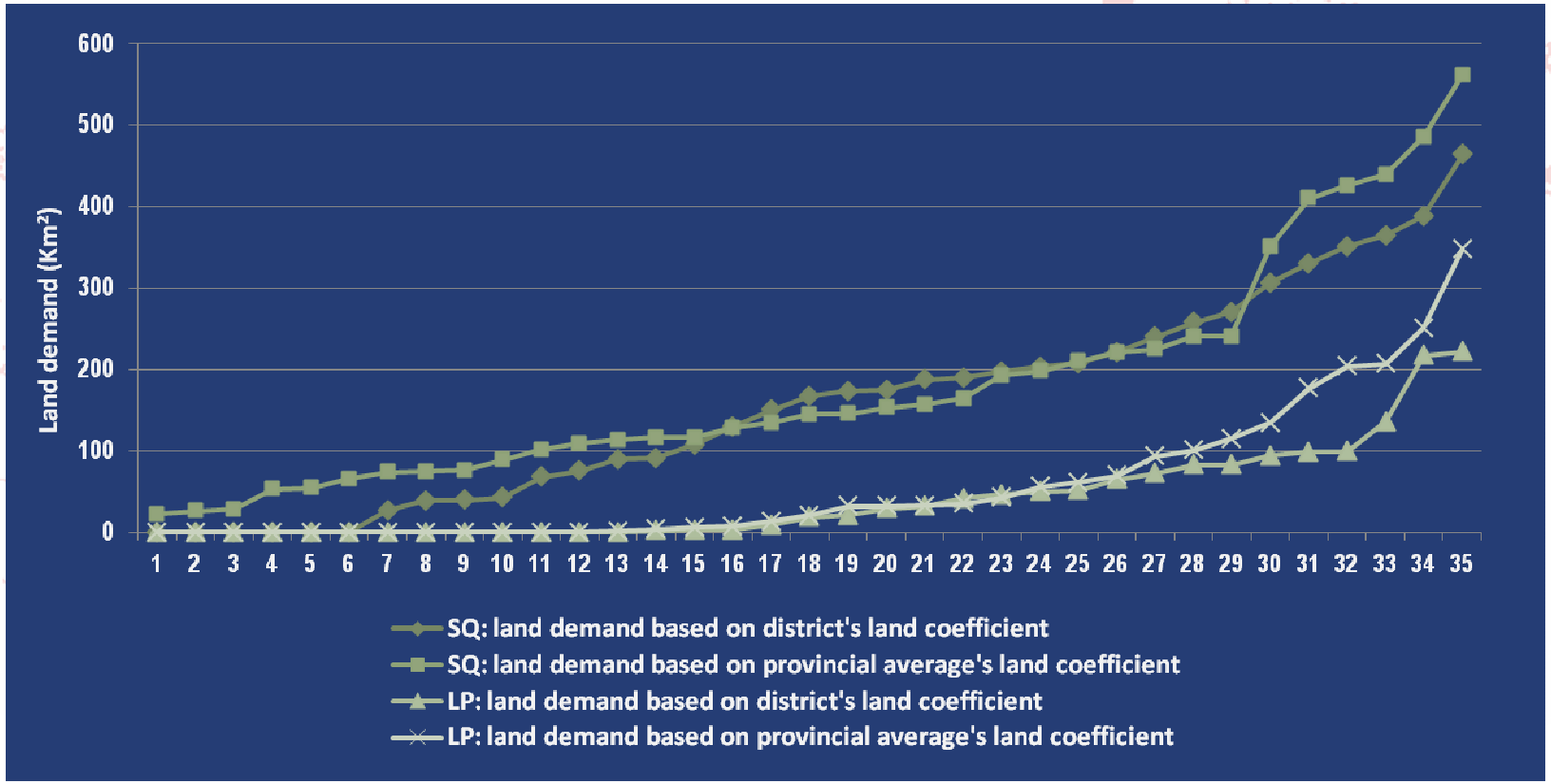
Pop2 = Population 2006

Pop1 = Population 1994

Year	Change in built-up area	Change in population	Land use coefficient (Provincial average, m^2 per person)
1994-2006	1836,52	2.701.907	640,569

Land use coefficient in Central Java, 1994-2006

Land Demand in 2030
Status Quo and Low Projection Scenario



SQ: Status Quo scenario LP: Low Projection scenario
Shrink district assumed as 0 (zero) growth population

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Land Potential:
Probability of Transferability Calculation

- Based on trend of land conversion that had been happenning between 1994 and 2006.
- The variables include:

  slope

  land use type

  distance from built-up in 1994

  distance from main road
- All variables were analyzed using ArcGIS 9.3. Most of the calculation are raster based within each 300mx300m cell sized (grid)

Land Potential:
Probability of Transferability Calculation

1

Slope	Area (Km²)	Proportion
> 40 %	0,37	0
0 - 8 %	1587,46	87
15 - 25 %	76,71	4
25 - 40 %	13,00	1
8 - 15 %	146,09	8
Water body	1,92	0
		100

2

Land use 1994	Land use 2006	Area (Km²)	Proportion
Dry Land Farming	Built-up	535,64	29
Forest	Built-up	65,16	4
Plantation	Built-up	4,67	0
Protected Paddy Field	Built-up	1206,95	66
Water Body	Built-up	23,18	1
			100

3

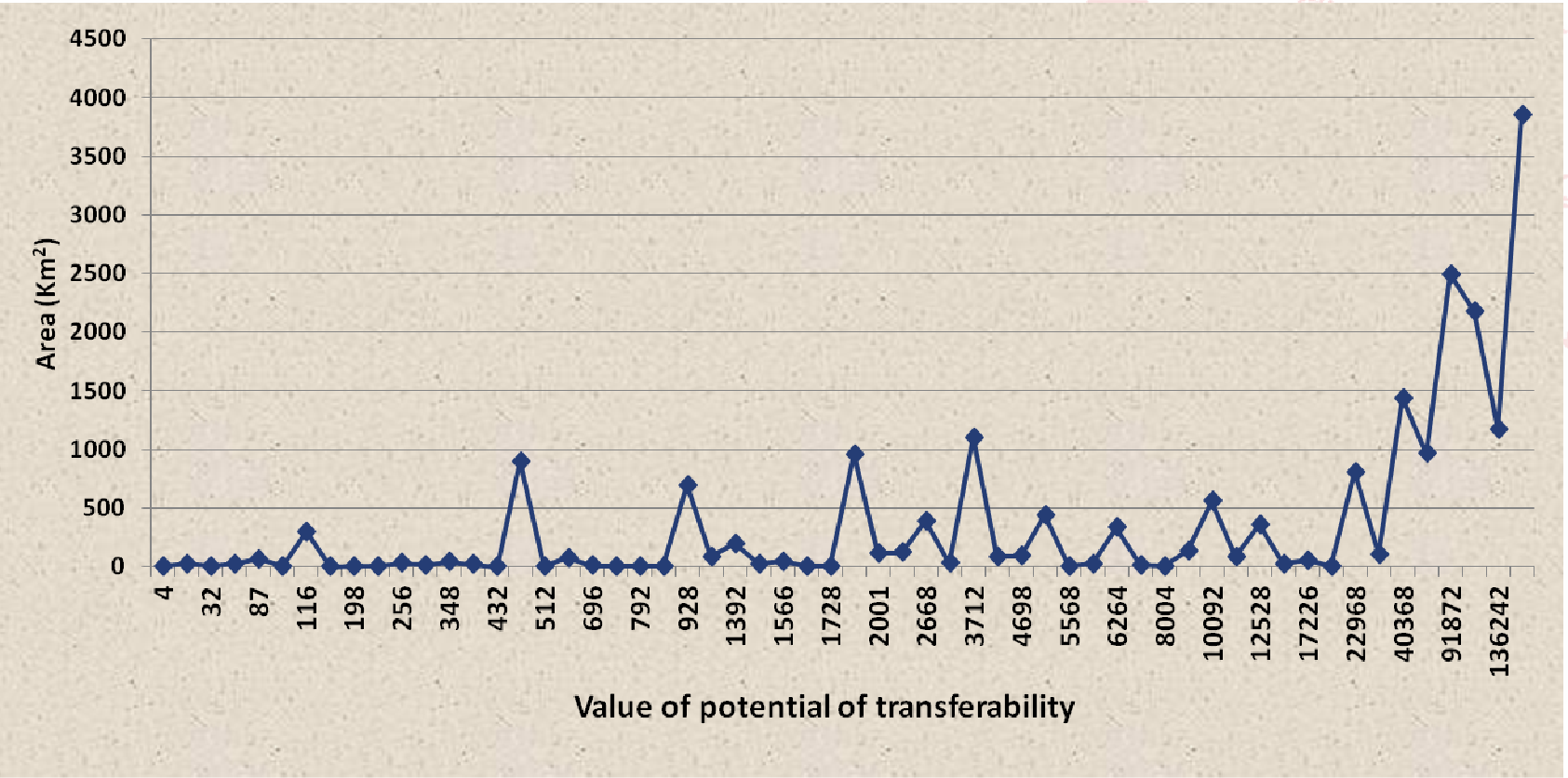
Distance from built-up 1994 (Km)	Polygons	Proportion
0-1	1781	54
1,01-2	772	23
2,01-5	529	16
5,01-12	144	4
12,01-19,1	87	3
		100

4

As it was indicated that all land use change are likely taking place in the radius of 1 km from the main road, therefore, there is not any detail result for distance from main road but only delineating the scope area of final analyses result into one km maximum distance from main road.

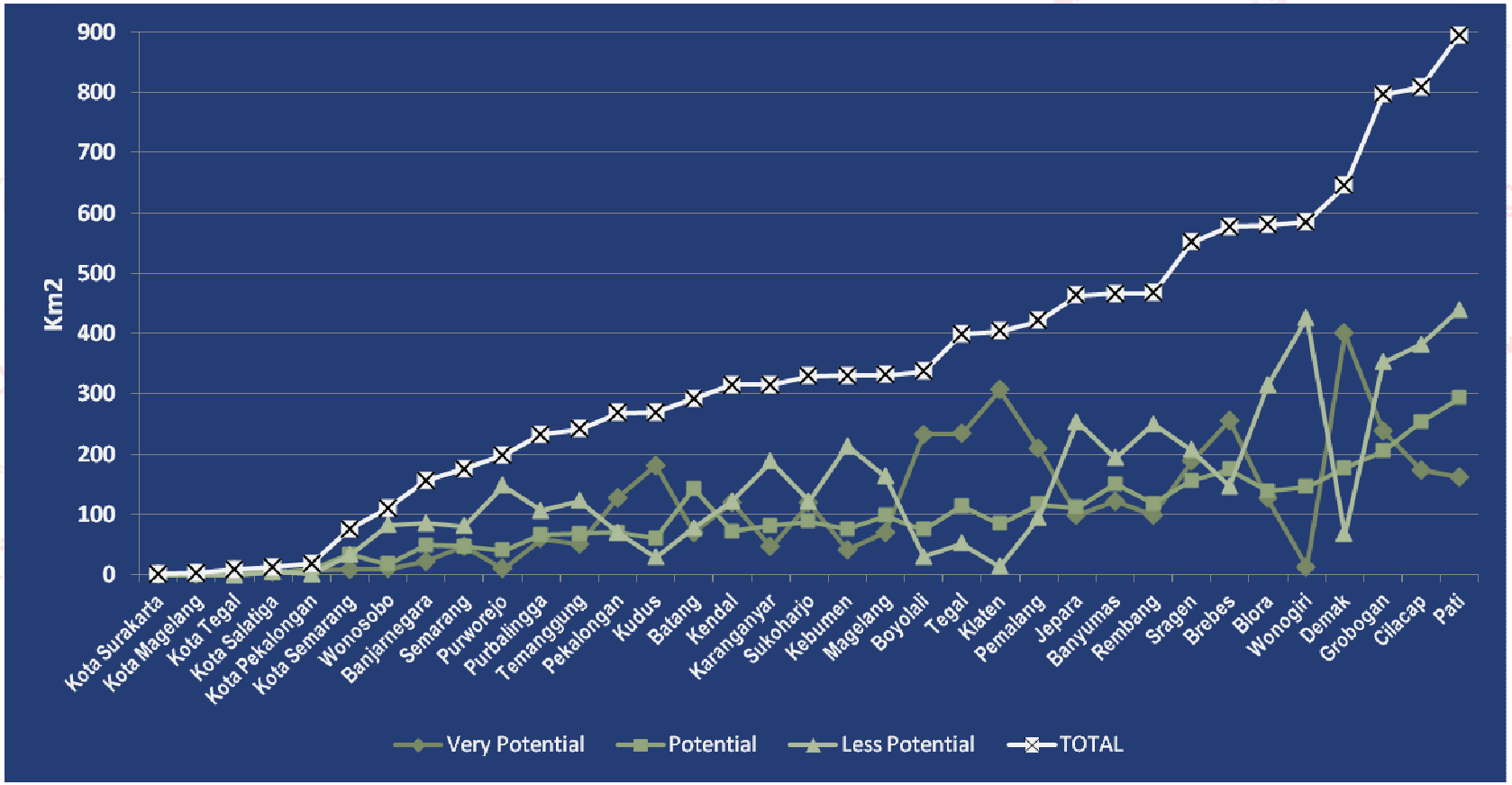
Value of Potential of Transferability

(based on data 1994 and 2006)



Potential of Transferability

(per District based on data 1994 and 2006)



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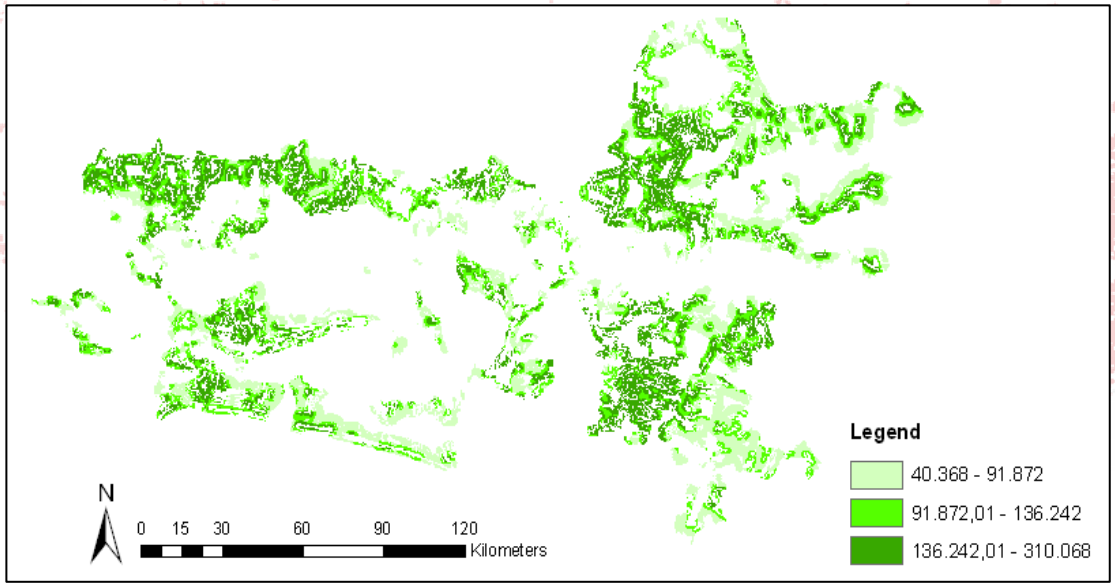
Potential of Transferability

(per District based on data 1994 and 2006)

Total Land Demand and Land Potential, 2030

(Km²)	LAND DEMAND		LAND POTENTIAL	
	District land coefficient	Provincial average land coefficient		
Status Quo	5560,165	6357,795	40.368-91.872=3604,59 91.872,01-136.242=2792,52 136.242,01-310.068=3392,46	Less potential Potential Very potential
Low projection	1482,811	2051,178		



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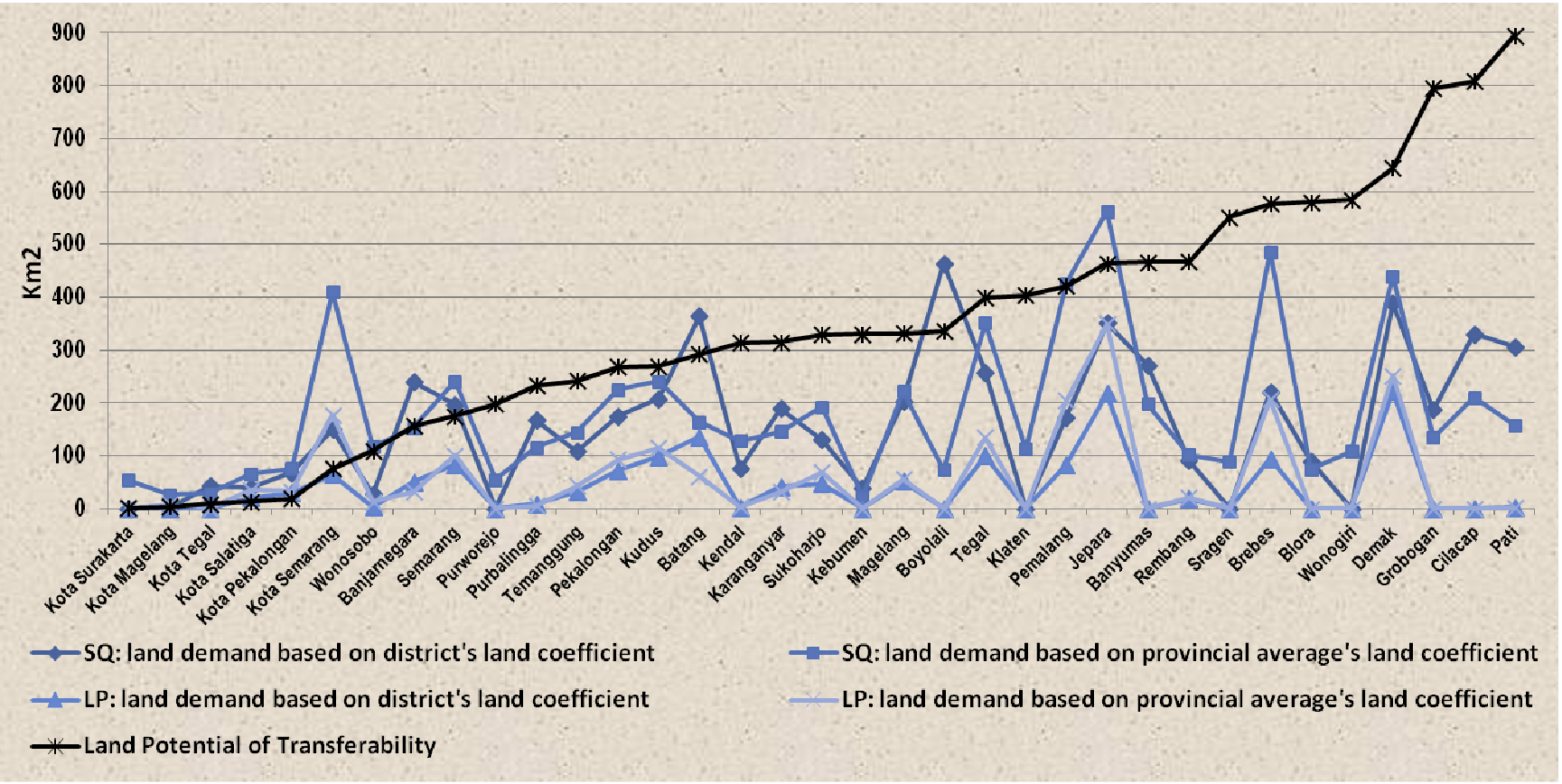
Land Demand and Land Potential of Transferability in District Level in Central Java, 2030



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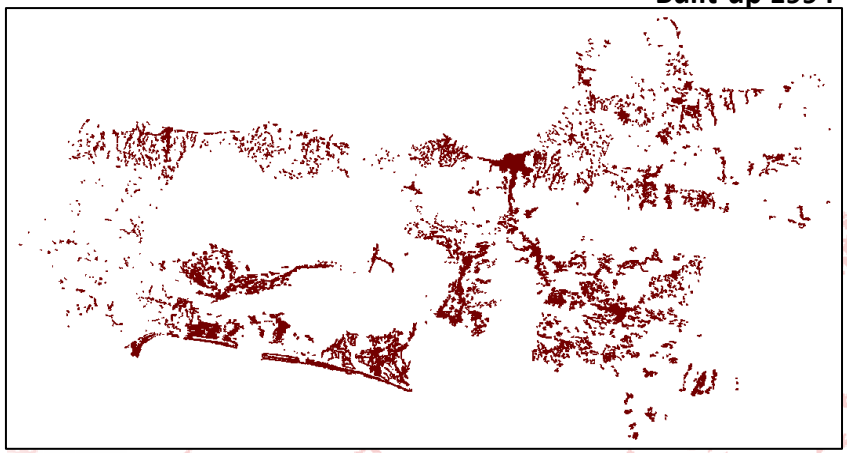
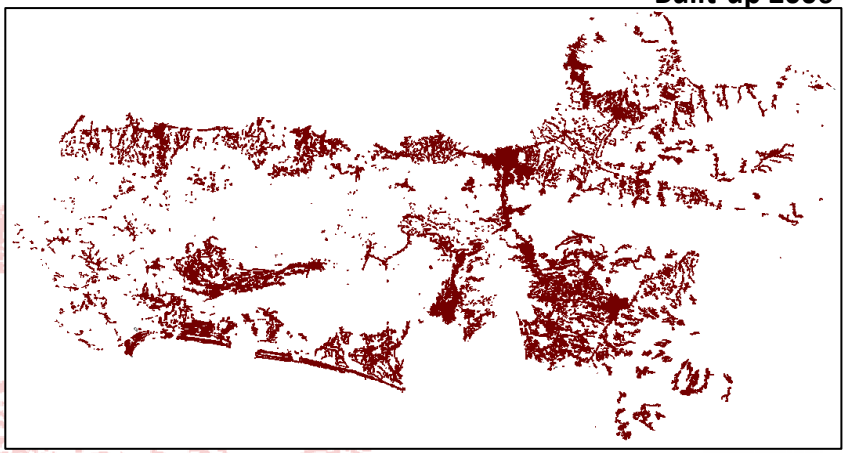
Land Demand and Land Potential of Transferability in District Level in Central Java, 2030

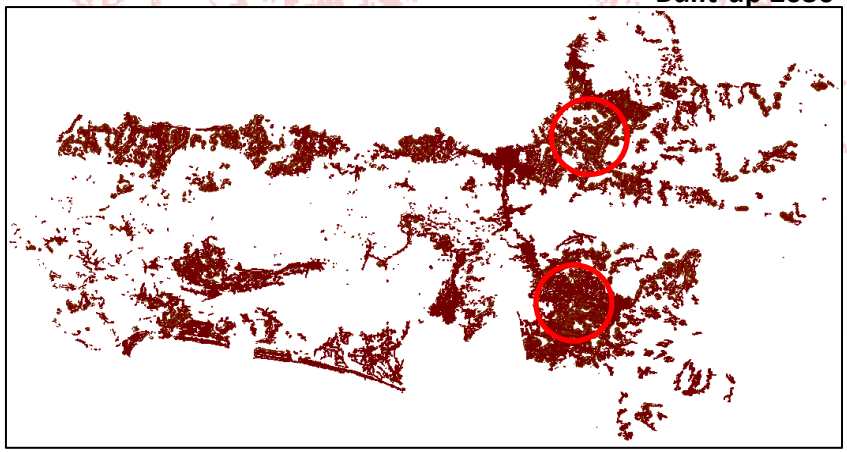
Built-up 1994



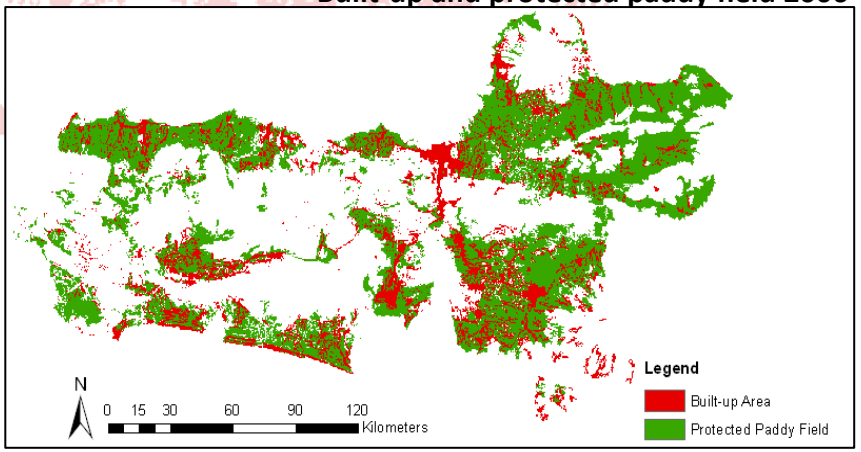
Built-up 2006



Built-up 2030



Built-up and protected paddy field 2006



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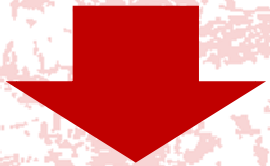
Brief Overview Regarding Analyses Result

- In general, the land demand is likely less than land supply

  BUT

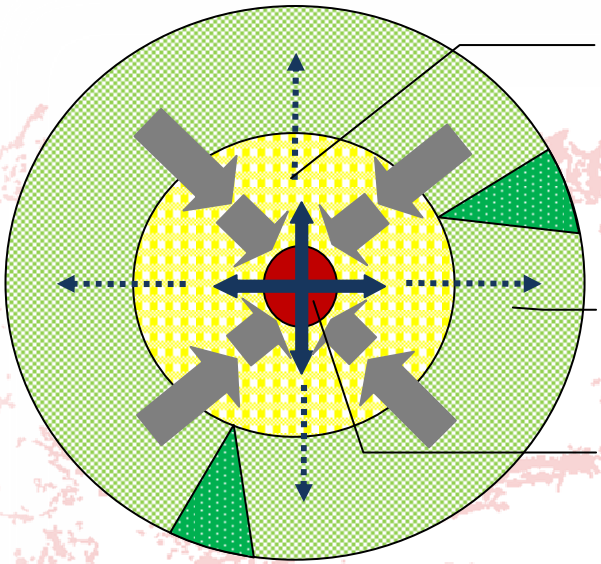
  If the pattern would be similar with the trend between 1994-2006, it will lead to a serious problem in food security
- There is still a lot of discrepancy between available land supply and estimated land demand.



- A ‘fundamental‘ change of policy framework is required to address the problems.

Course to Balanced Development: a Brief Policy Review (#1)

Dillema of two headed snake: growth vs. equity



Inner zone (Developed region)
Favorable site for big manufacturing (mostly foreign based) industries due to better infrastructure support and closer to any required urban facilities.
Attract significant number of laborers and other potential resources from outer regions.

Outer zone (Underdeveloped region)
Mostly dominated by agricultural activities.

Core (the most developed region)
Perform as a growth centre

: Spread effect of the growth centre that is unfortunately unbalanced with the backwash effect.

: Spread affect which gets lesser in the outer zone.

: Backwash effect (core as well inner zone take so many potential resources from outer zone)

: Endogenous potential in the outer zone that should be developed to have a more balanced development

Rapid growth cannot always be a good sign of development

UNBALANCED → DISPARITY

Course to Balanced Development: a Brief Policy Review (#2)

Recognition of critical situation regarding Food Security

- Indonesian rice consumption is 133 kg per capita, the highest worldwide (to compare: Thailand is 80 kg per capita, and Japan is 40 kg per capita)
- Java is still dominating rice production in Indonesia by contributing ± 60 per cent of national production in 2000.
- 66 per cent of land conversion (± 1212,1km^2) in Central Java has been utilized arable land (Protected paddy field). Similar phenomenon for other provinces in Java Island.

- Urgently need to ‘re-allocate‘ urbanization by enforcing development outside Java.
- Breakthrough regarding land use and agricultural integrated policy

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Conclusion

- Land allocation is critical for development in Central Java, a lot of homework to be done.

- Potential solutions would be begin with determining ‘new‘ policy criteria and increasing commitment from any related stakeholders to improve institutional capability.

Terimakasih... Thank You... Vielen Dank

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