

# Geo-enabled Decision Support System

## Working Presentation Jakarta, 14-21 Dec 2015

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## Preparation of Data: 21 Dec, 2015

Data Required	Processed Output	Responsible Person
Base map 25.000 (only for selected Desa in Bali 12 Sheets) Base map 250.000 (Bali and Papua)	(i) Political boundary map – Province, Regency, City, Districts, Desa, and Settlement, with basic information ex. No. of HH, Population, Electrified HH No. or Ration, Av. electricity consumption (@HH-month), etc. (ii) Point data of city, desa, settlement/villages with their name and categories (ex. provincial, district and desa capitals and villages)	Pak Kemal  (river gauge Pak Harun)
Population by desa	(iii) Line data of Electricity grid – categories ex. national/provincial high tension, distribution	
Electrification ratio by desa and supply (PLN vs. non-PLN)	(iv) Contour (line) and Spot Ht. (point) data and DTM (grid)	
Desa boundaries	(v) Road network (line) – categories (a) national, provincial highway and district road, etc. (b) types ex paved and gravel, dirt, etc. and (c) corridor ex. industrial, commercial freight, residential, etc.	
Settlements boundaries	(vi) River network (line) – categories ex. perennial, seasonal river	
River network, basin boundary, road network, etc.	(vii) Basin boundary (polygon), basin outlet (point)- hydro potential head. attribute and river gauge location (point) – having gauge reading attribute (viii) Geothermal (point) with attributes	
Solar radiation; Wind speed	Solar irradiance and wind map (grid)	Pak Miyazaki
Solar Irradiance and Wind Speed (50 m.) Ground Station Data	Location (point) with observation data as attribute	Ms. Dian/Pak Kemal
(i) Land use/land cover map (whole Indonesia); BIG/2013 (ii) Plantation (Bali);WRI/2014	Clean land use/land cover and plantation maps (polygon) – with proper attributes (ex. main and sub categories/tyeps) of pilot area with their categories	Pak Kemal
Heating Value for Biomass	Table 1: Fresh and Dry weight Ratio, Table 2:Yield and Heating Value (preferably Higher Heating Value (HHV)) – (a)Residuals from Agriculture/Plantation, (b)Plantation and (c)Others → as in TOR (XLS format)	Pak Ridlo

# Geo-enabled DSS → step by step dev.

- I. Potential: capable of development into actuality
- II. Suitable: having the qualities that are right, needed, or appropriate for something
- III. Building mechanism to harvest: taking account of market and government policies
- IV. Future plan beyond Feb
  - What can be and what should be done
  - Local capacity building
  - Global Knowledge partnership
  - Others....

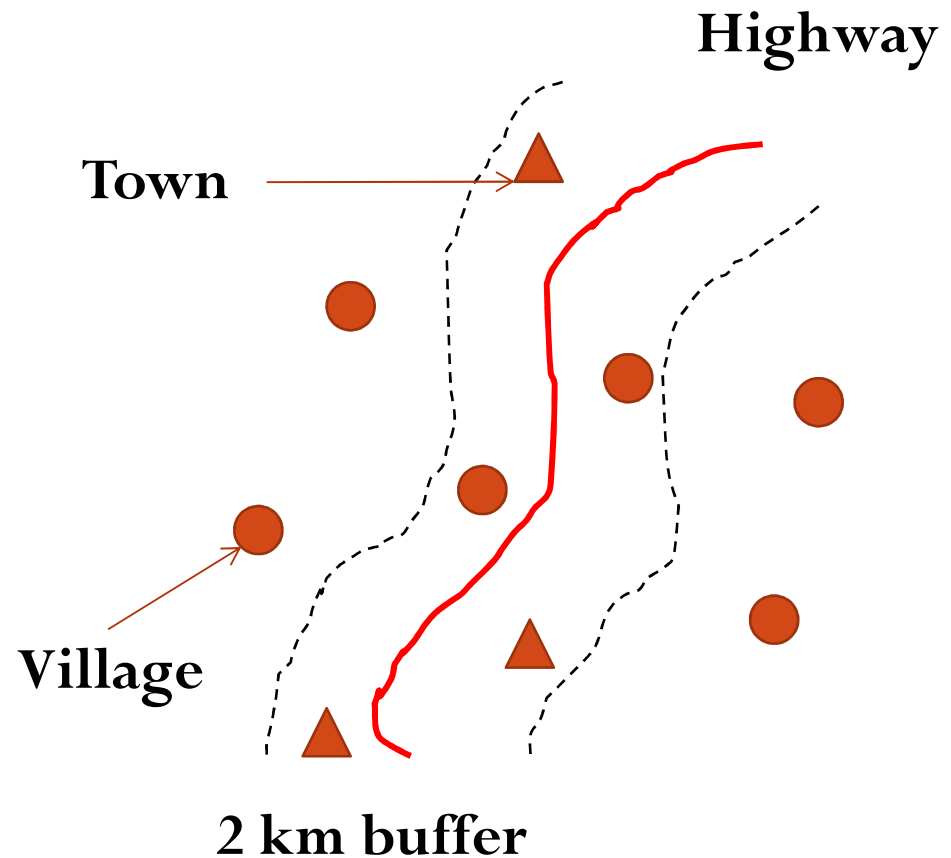
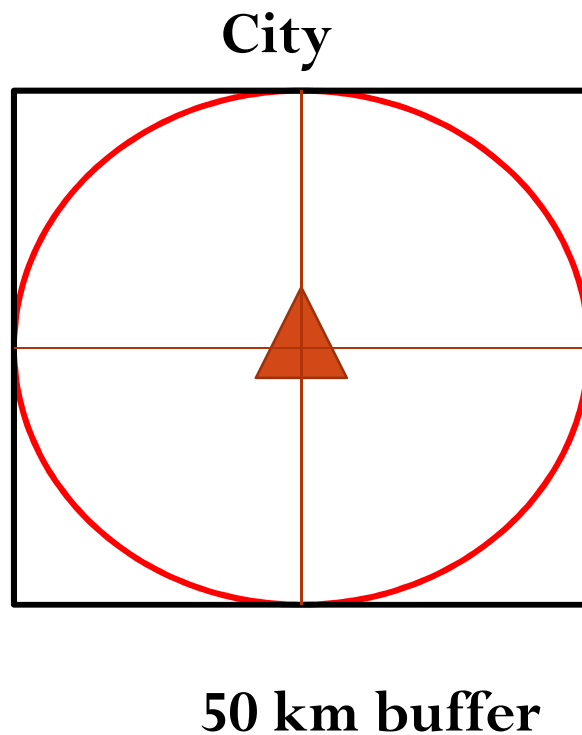
# Geo-enabled DSS → Solar Energy Suitability Mapping

Variables Consideration (ex. European case)

- Irradiance  $\geq 900$  kW h/m<sup>2</sup>/year
- Slope = 16 to 30 % → poor
- Distance from the city ( $> 1$  inhab/ha)  $> 500$  m
- Distance from the road  $< 5000$  m
- Closer to electricity grid is better

## Geo-enabled DSS → Considerations

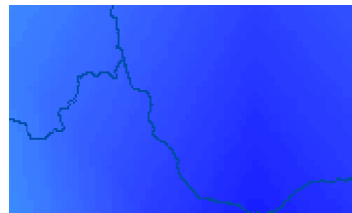
- On-grid, mini-grid, off-grid,
- Segregating area for On-grid and Off-grid
- Notion of urban and rural electrification
- others...



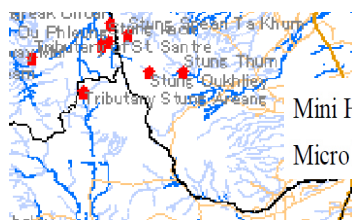
# Energy Mapping and Mix → conceptual framework



Solar Irradiance  
Annual Av. 4.73 -  
5.31 kW/m<sup>2</sup>/day

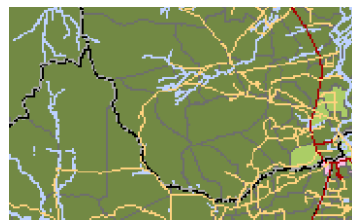


Wind Speed (at  
50m ht.) 2.67 -  
4.64 m/s



Hydropower

Mini Hydro : 500 kW ~ 5 MW  
Micro Hydro : < 500 kW



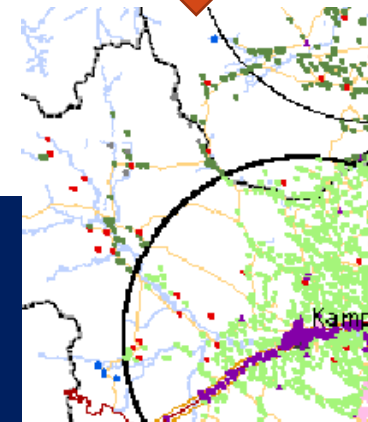
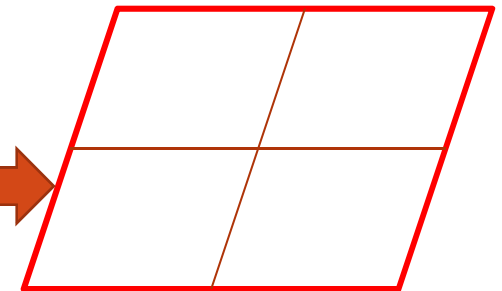
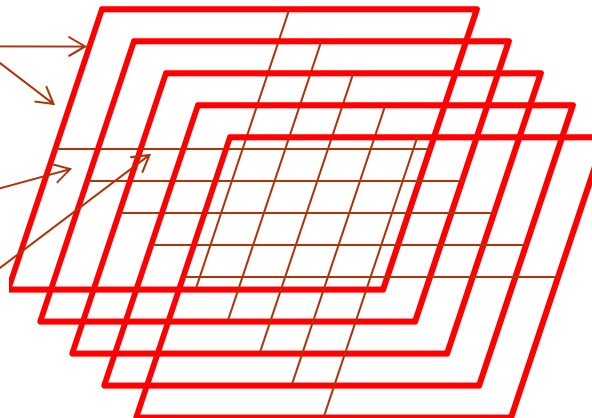
Biomass

Agriculture Land		Biomass Gassification (On an average 0.02 ha/HH for supplying 10 kWh/HH/month)
Plantation-tree, rubber, palm, etc.		
Grass Land		
Forest Land ??		
Waste Land		
Agriculture Residuals	Content (%)	Heating Value (MJ/Kg)
Rice husk	20	13-16
Cashew nuts shell	70	19
Sugarcane bagass	30	15 - 20
Peanuts shells	30	19

Geothermal ??

Grid Suitability Calculation;  
Considering Geophysical and  
Technological Potentiality

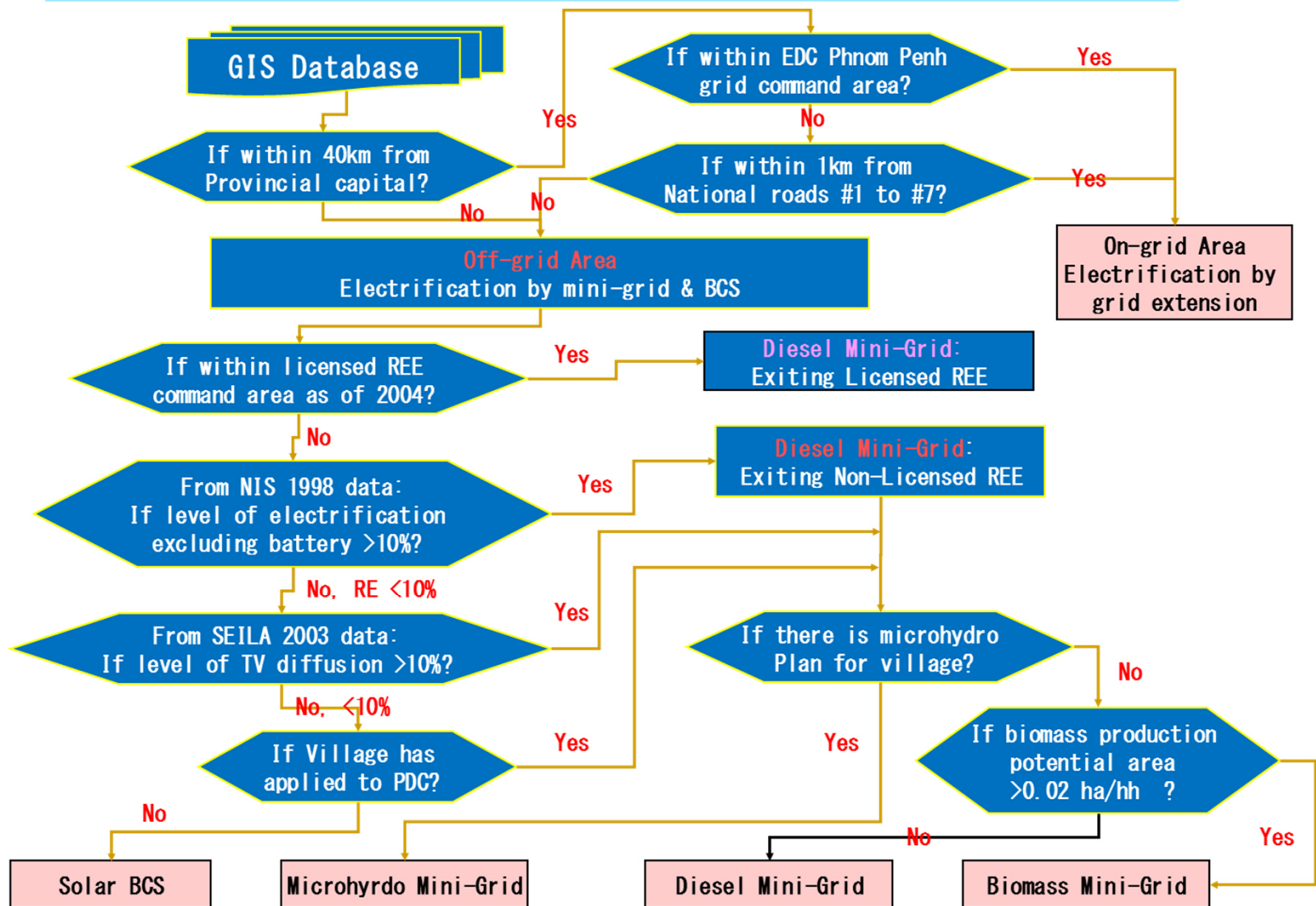
Grid-  
Renewable  
Energy Mix



Settlement-  
Energy Source  
Suitability Map

# Geospatial Analysis for Energy Mix→ Building Logical Framework

Flow of the Energy Selection Simulation Model: Energy Mix and on & Off Grid Electrification



# Work Schedule

