

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) (iii) Line data of Electricity grid – categories ex. national/provincial high tension, distribution (iv) Contour (line) and Spot Ht. (point) data and DTM (grid) (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. (vi) River network (line) – categories ex. perennial, seasonal river (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	Pak Kemal (river gauge Pak Harun)
Population by desa		
Electrification ratio by desa and supply (PLN vs. non-PLN)		
Desa boundaries		
Settlements boundaries		
River network, basin boundary, road network, etc.		
Solar radiation; Wind speed		
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....

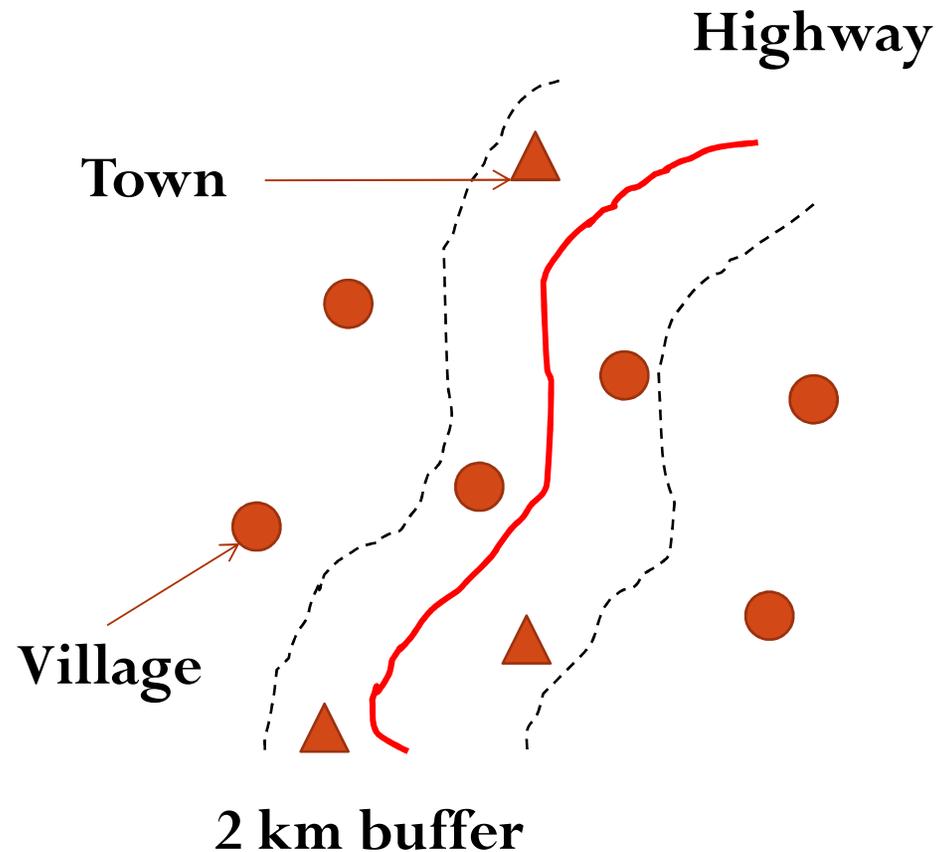
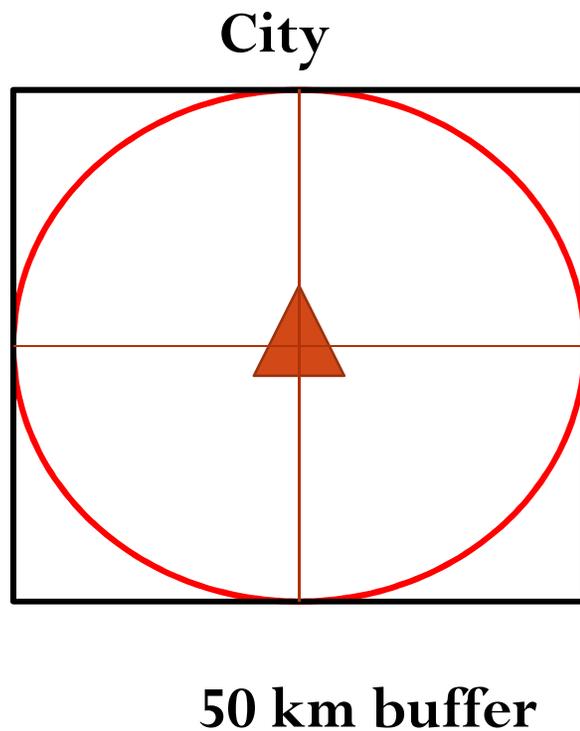
Geo-enabled DSS → Solar Energy Suitability Mapping

Variables Consideration (ex. European case)

- Irradiance ≥ 900 kW h/m²/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...



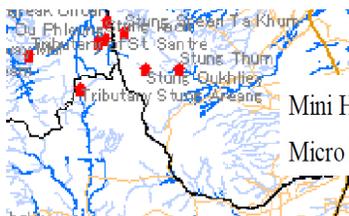
Energy Mapping and Mix → conceptual framework



Solar Irradiance
Annual Av. 4.73 -
5.31 kW/m²/day



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



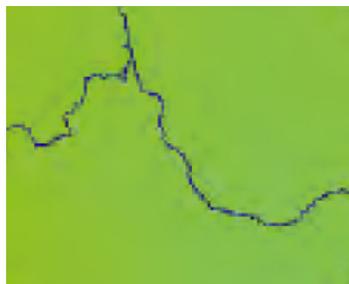
Hydropower

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



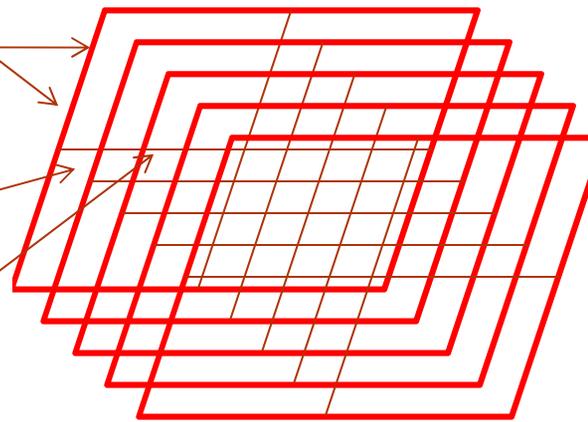
Biomass

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

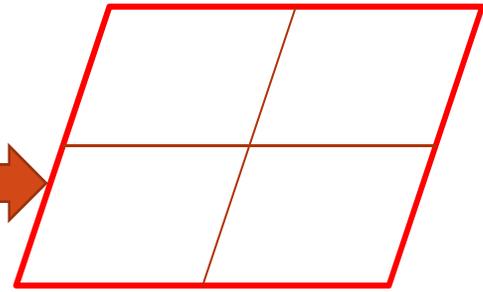


Geothermal ??

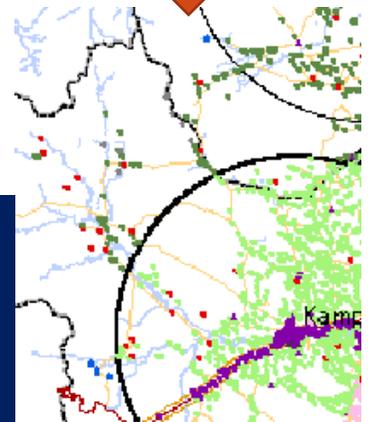
Grid Suitability Calculation;
Considering Geophysical and
Technological Potentiality



Grid-
Renewable
Energy Mix

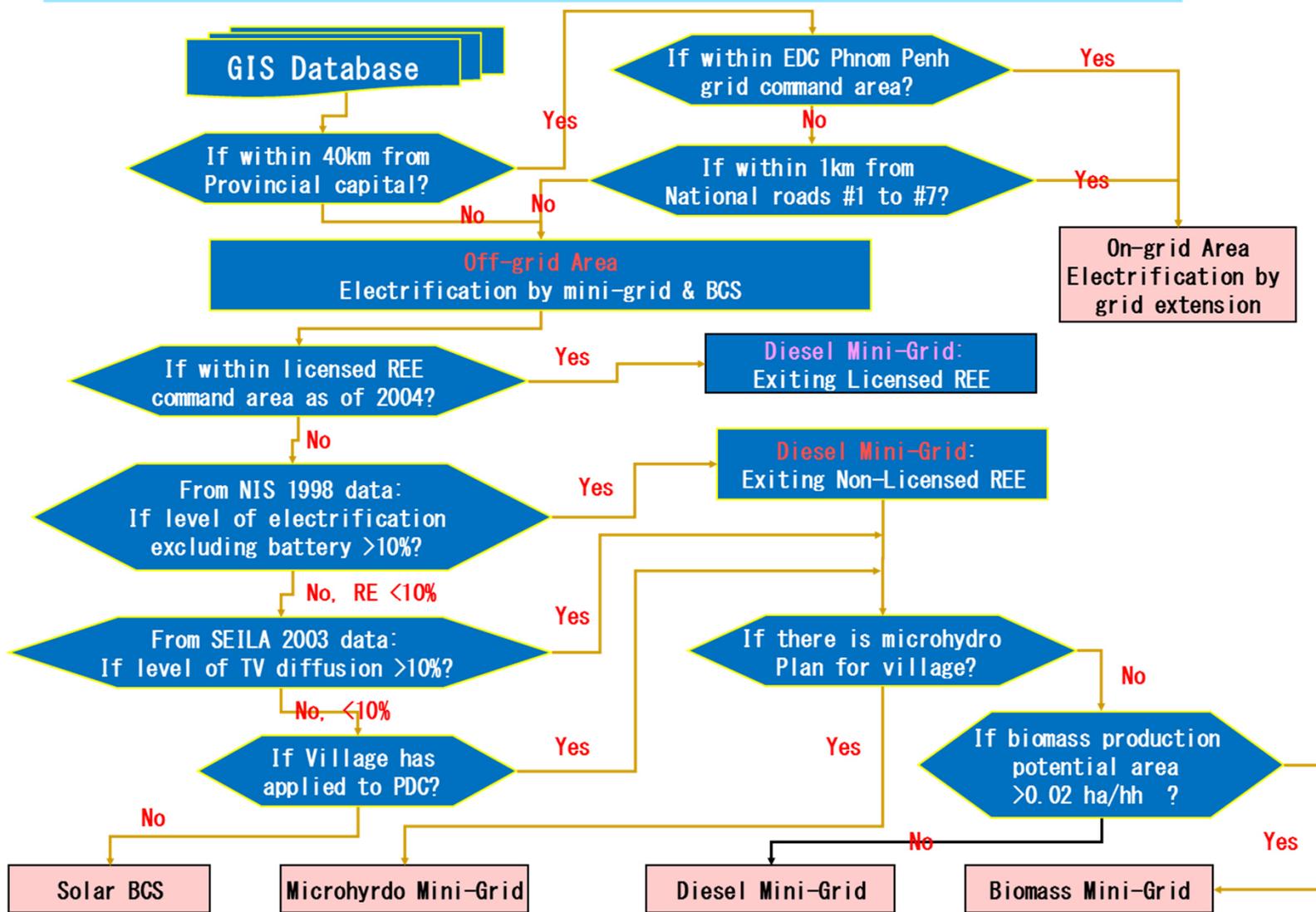


Settlement-
Energy Source
Suitability Map



Geospatial Analysis for Energy Mix → Building Logical Framework

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



Work Schedule

