Land Account : Indonesia
Outline

• Environmental concerns
• Approach in compiling land account
• Results: Sumatera Land Account, Experimental Estimates
• Challenges
• Policy applications
• Further work
Environmental concerns

- Biodiversity loss
- Land and Forest
- Fire

Needs of Data Sector

- Economic impacts
- Disaster
- Loss and damage infrastructure
- Biodiversity Loss
- Carrying Capacity

- Food security
- Land use planning
- Agriculture
Approach in compiling Indonesia’s land account

KLHK business process

Ministry of Environment and Forestry

Land Cover Data

BPS – Statistics Indonesia

Geospatial Processing

Statistical Processing

Data Dissemination

• Prepared Land Cover by province and year
• Calculate Area
• Calculate Land Cover Change

• Calculate Gross Change tables
• Calculate Net Change tables
Business process in Ministry of Environment and Forestry
REQUIREMENT OF GEO-SPATIAL INFORMATION:

FUCTION OF SPATIAL DATA

- To Manage of National Sovereignty
- Natural Resources Inventory
- Optimazing of Natural Resources
- Manage of HAZARDS and Mitigation
- Land Use Plan
- Investment security
GEO-INFORMATION FOR INSTRUMENT OF DEVELOPMENT PLANNING

**ECONOMIC**. Spatial planning for investment

**ENERGY**
Spatial planning renewable energy

**LANDUSE & SPATIAL PLANNING**
National and Sub National Landuse planning

**STRATEGYC SECTOR**
Agriculture, Marine, Health Planning

**ENVIRONMENT AND FORESTRY**
Management Planning

**INFRASTRUKTUR**
Infrastructure Planning
Regulation of Geospatial Information

- Law 4/2011: Geospatial Information: Article 3: This law aims to: ...
  (c) encourage the use of IG in governance and in various aspects of community life

- President al Regulation No 27/2014: National Geospatial Information Network: Geospatial Information (IG) ... can be used as a tool in policy formulation, decision-making, and/or implementation of activities related to earth spaces. ... making of IG conducted through Geospatial Data collection activities (DG); processing, storage, securing, dissemination of DG and IG; and use of IG. Geospatial Information Network is a system of organizing IG management collectively, orderly, measurable, integrated, and sustainable and efficient. Network node is the institution responsible for organizing the collection, maintenance, updating, exchange and dissemination of certain DG and IG. 3.

- Presidential Regulation no. 9/2016 on Accelerated Implementation of One Map Policy)
The Geospatial Information Agency (BIG) completed a 1:50,000 RBI Base Map. K/L/Pemda completed mapping thematic information on RBI 1:50,000 Basic Map. Spatial data synchronization (in status) and potential land use on base map 1:50,000.

Source: Kemenko Perekonomian, 2015
One Data Forestry and Environment

http://geoportal.menlhk.go.id
METHOD FOR LAND COVER MAP PRODUCTION

Supporting data:
• MODIS
• ALOS, SPOT
• Concessions map
• etc.

Visual interpretation

Image processing (enhancement)

Land Cover Map (Geodatabase)

Landsat Images

Deforestation Map

Deforestation Calculation

Ground check

Re-interpretation

Information Dissemination (NFMS Web)

feedback
Ina-Geoportal (Indonesia-Geospatial Portal) is an Indonesian Geospatial Portal built with the participation of various ministries and institutions as well as local government in Indonesia.

- **O1** Serves as a major gateway to geospatial information access and as a means of data sharing
- **O2** As a means of searching spatial metadata and meta service
- **O3** The geospatial data search facility is distributed with technical specifications of WFS, WCS, and WMS
One Data Forestry and Environment

http://geoportal.menlhk.go.id
Landsat Mosaic – Landcover data since 1990-2016

Data Source:
- Landsat 5 TM
- SPOT Vegetation
- Landsat 7 ETM+
- Landsat 8 OLI (since 2013)
LAND COVER DATA AND MAP

MAP AND BOOK (TABLE AND DIAGRAM OF DEFORESTATION)
Business process in BPS-Statistics Indonesia
Geospatial Processing

Step 1a  Land Cover Map by Province and Year

Step 2a  Calculate Land Cover Area
### Geospatial Processing (2)

**Step 3a**

Calculate Land Cover Change

<table>
<thead>
<tr>
<th>FID_lcem</th>
<th>PL09_ID</th>
<th>area_2009</th>
<th>FID_lcem_1</th>
<th>PL12_ID</th>
<th>area_2012</th>
<th>lc_change</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>2001</td>
<td>505189,814422</td>
<td>0</td>
<td>2001</td>
<td>505189,814422</td>
<td>365,714378</td>
</tr>
<tr>
<td>0</td>
<td>2001</td>
<td>505189,814422</td>
<td>1</td>
<td>2002</td>
<td>1009996,54306</td>
<td>285,714378</td>
</tr>
<tr>
<td>0</td>
<td>2001</td>
<td>505189,814422</td>
<td>2</td>
<td>2007</td>
<td>606658,233601</td>
<td>1726,841542</td>
</tr>
<tr>
<td>0</td>
<td>2001</td>
<td>505189,814422</td>
<td>3</td>
<td>2014</td>
<td>252716,230064</td>
<td>590,79267</td>
</tr>
<tr>
<td>0</td>
<td>2001</td>
<td>505189,814422</td>
<td>4</td>
<td>20091</td>
<td>2227974,00649</td>
<td>54,836343</td>
</tr>
<tr>
<td>0</td>
<td>2001</td>
<td>505189,814422</td>
<td>5</td>
<td>20092</td>
<td>308654,769696</td>
<td>21,236179</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>1</td>
<td>2002</td>
<td>1009996,54306</td>
<td>1007754,91132</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>2</td>
<td>2006</td>
<td>137686,57958</td>
<td>1018,704519</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>3</td>
<td>2007</td>
<td>606658,233601</td>
<td>27625,078631</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>4</td>
<td>20091</td>
<td>308654,769696</td>
<td>21,236179</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>5</td>
<td>20092</td>
<td>308654,769696</td>
<td>21,236179</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>6</td>
<td>2010</td>
<td>1367864,9526</td>
<td>566,816181</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>7</td>
<td>2014</td>
<td>252716,230064</td>
<td>24454,852786</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>8</td>
<td>20091</td>
<td>2227974,00649</td>
<td>1599,572836</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>9</td>
<td>20092</td>
<td>308654,769696</td>
<td>429,860122</td>
</tr>
<tr>
<td>1</td>
<td>2002</td>
<td>106389,4607</td>
<td>10</td>
<td>20093</td>
<td>291620,84381</td>
<td>39,864039</td>
</tr>
<tr>
<td>2</td>
<td>2004</td>
<td>1443,216004</td>
<td>2</td>
<td>2004</td>
<td>1443,216004</td>
<td>1443,216004</td>
</tr>
<tr>
<td>3</td>
<td>2005</td>
<td>3301,403091</td>
<td>3</td>
<td>2005</td>
<td>1646,929605</td>
<td>1646,929605</td>
</tr>
<tr>
<td>3</td>
<td>2005</td>
<td>3301,403091</td>
<td>4</td>
<td>2014</td>
<td>252716,230064</td>
<td>1634,008428</td>
</tr>
<tr>
<td>3</td>
<td>2005</td>
<td>3301,403091</td>
<td>5</td>
<td>20071</td>
<td>62526,489873</td>
<td>20,465058</td>
</tr>
<tr>
<td>4</td>
<td>2006</td>
<td>149973,165972</td>
<td>4</td>
<td>2006</td>
<td>137688,757958</td>
<td>123919,481794</td>
</tr>
<tr>
<td>4</td>
<td>2006</td>
<td>149973,165972</td>
<td>5</td>
<td>2007</td>
<td>606658,233601</td>
<td>2846,287813</td>
</tr>
<tr>
<td>4</td>
<td>2006</td>
<td>149973,165972</td>
<td>6</td>
<td>2010</td>
<td>1367864,9526</td>
<td>4469,264357</td>
</tr>
<tr>
<td>4</td>
<td>2006</td>
<td>149973,165972</td>
<td>7</td>
<td>2014</td>
<td>252716,230064</td>
<td>17607,830107</td>
</tr>
<tr>
<td>4</td>
<td>2006</td>
<td>149973,165972</td>
<td>8</td>
<td>20091</td>
<td>2227974,00649</td>
<td>985,348344</td>
</tr>
<tr>
<td>4</td>
<td>2006</td>
<td>149973,165972</td>
<td>9</td>
<td>20092</td>
<td>308654,769696</td>
<td>35,792038</td>
</tr>
</tbody>
</table>
Geospatial Processing (3)

Step 1b  Land Use Map by Province and Year

Step 2b  Calculate Land Use Area
Geospatial Processing (4)

Step 4 Calculate Cross Classification Land Cover and Land Use Area
Challenges: User needs

1. Ease of Access Information for government, local governments, the public and the wider community
2. Transparent and Good methods, Publications etc (image data type, delineation way, field verification, QC field results)
3. Consistent each period
4. Accurate and Up to Date (assessment of accuracy)
Policy application

• Forest monitoring
  o Monitoring deforestation

• Emission monitoring
Thank you

Jointly Prepared by:
Dr. Sigit Nugroho (sigit.nugroho.ssi@gmail.com)
Head of Sub Directorate For Forest Resources Monitoring. Directorate of Inventory and Forest Resources Monitoring. Ministry of Environment and Forestry

Etjih Tasriah (tasriah@bps.go.id)
Head of Sub Directorate For Regional Production Account Consolidation, BPS-Statistics Indonesia

Budi Budiman (budiman@bps.go.id)
Head of Section For Area MapContent Development, BPS-Statistics Indonesia