DRIVERS TO LEVERS

Identifying Land-Forestry Policy Levers from Participatory Understanding of Drivers of Forest Conversion: Case Study from Three Provinces of Indonesia

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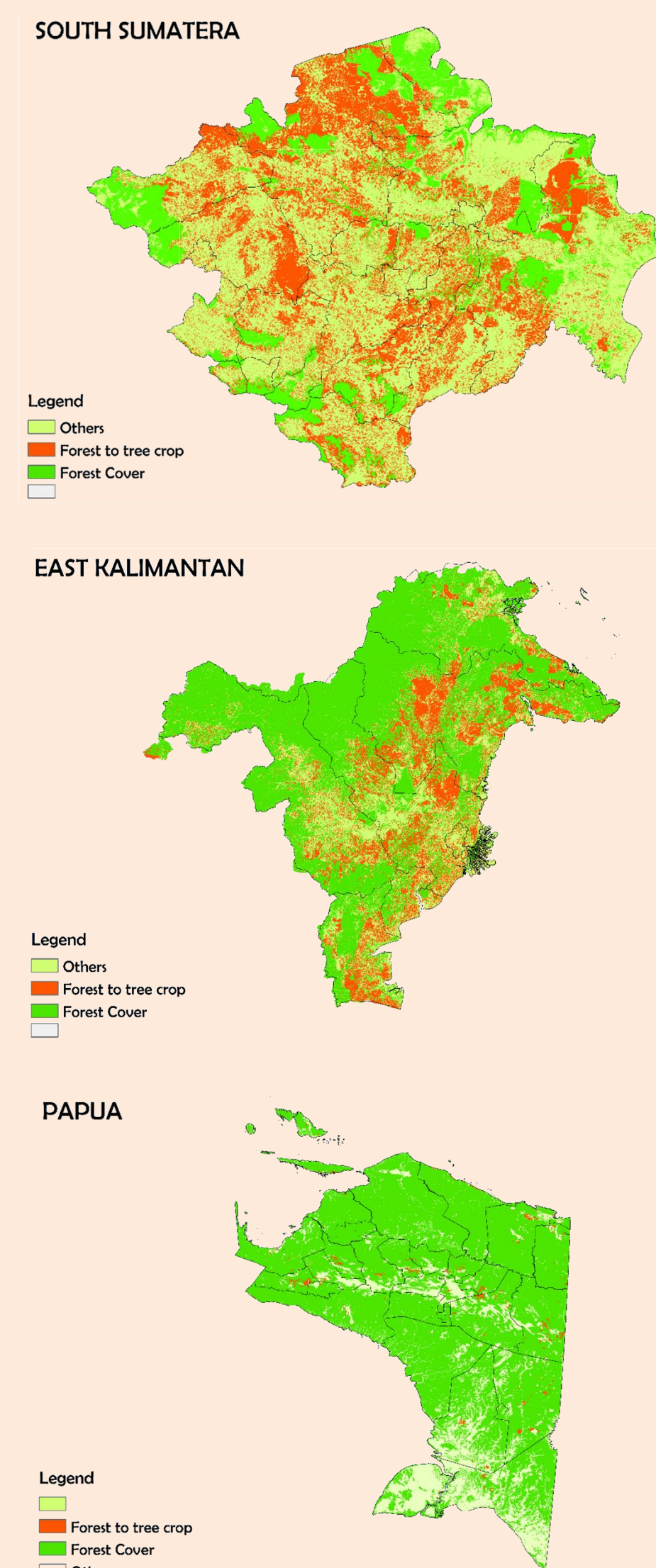
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BACKGROUND AND OBJECTIVES

Forest conversion in Indonesia is always considered as one the most important source of environmental services degradation in the country. Although a lot of effort has been conducted, ineffective action is often occurred because of failure to understand the right drivers of forest conversion. We use the Driver–Pressure–State–Impact–Response (DPSIR) framework in a multistakeholder-participatory processes to identify the most suitable responses to address forest conversion in three provinces of Indonesia: South Sumatra (SS), East Kalimantan (EK) and Papua. The processes consist of several key steps:

1. pattern analysis of land use land cover change
2. identifying network of factor for forest conversion
3. selection of key factors, identification of policy levers to address the key factor and
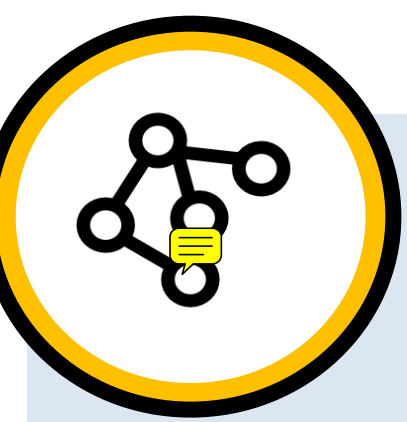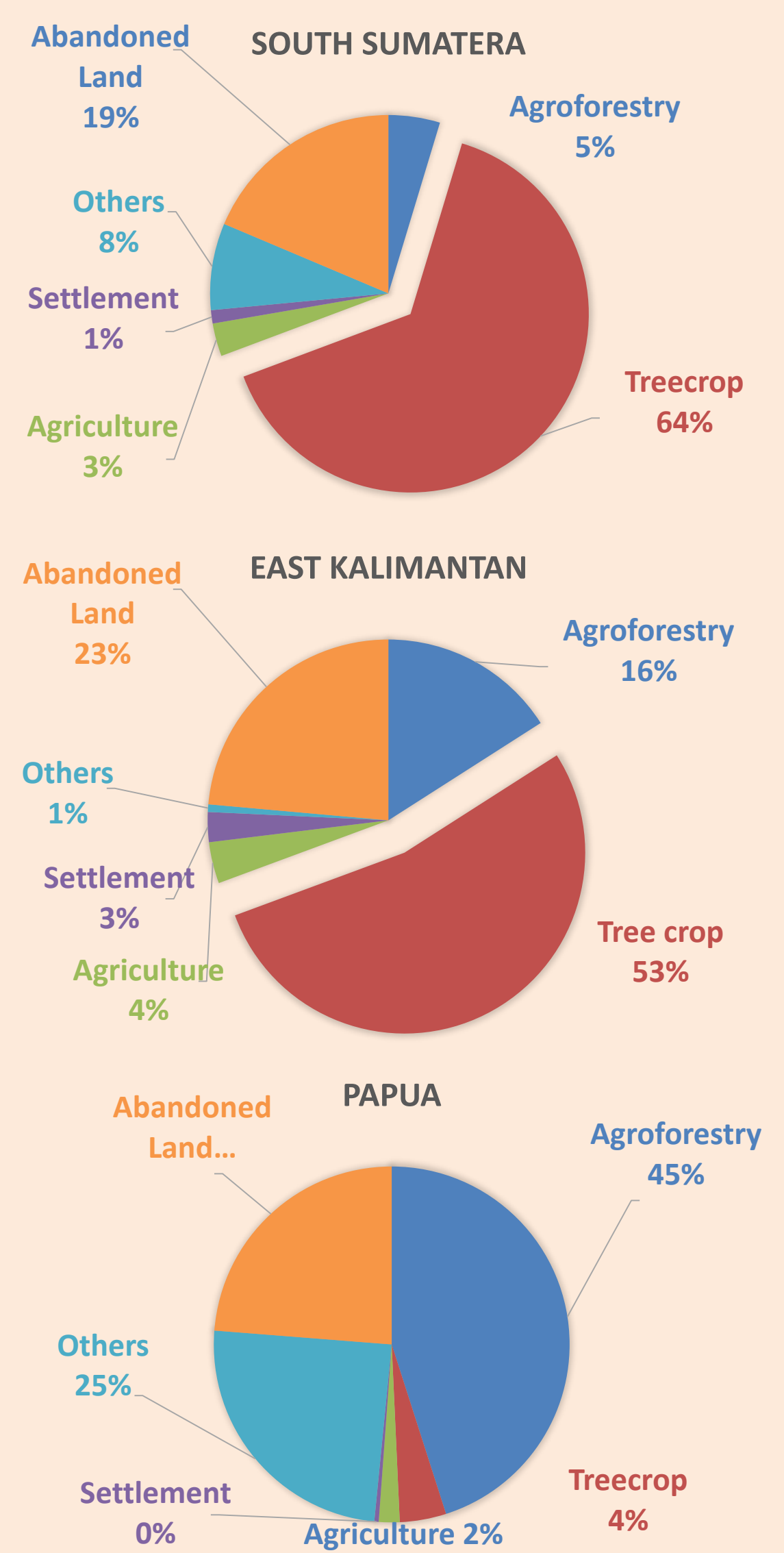4. public consultation on the options of policy levers.
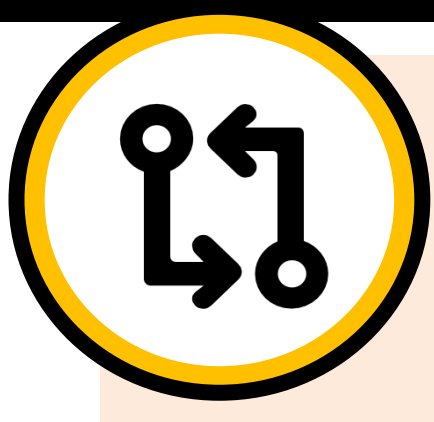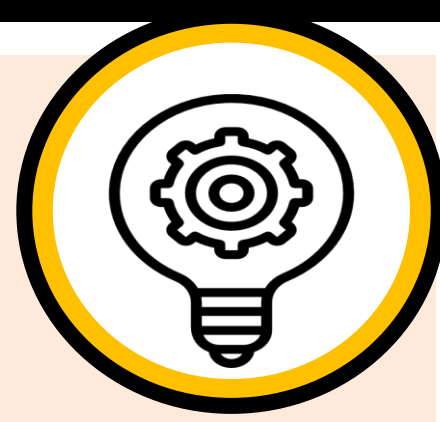
ANALYSIS OF LAND USE/ COVER CHANGE

This step quantifies historical land use/cover change patterns, finds the major trajectories and identifies the hotspots. Land cover data were used from 1990-2015 (except Papua 2000-2011). South Sumatera and East Kalimantan were dominated by forest conversion to Tree cropping. Changes to tree cropping cover up to 64% of total area of South Sumatera and 53% of East Kalimantan. In other words more than half of their provinces. While in Papua still tend to degradation, from primary to secondary forest.

SOUTH SUMATERA

Legend
Others
Forest to tree crop
Forest Cover

EAST KALIMANTAN

Legend
Others
Forest to tree crop
Forest Cover

PAPUA
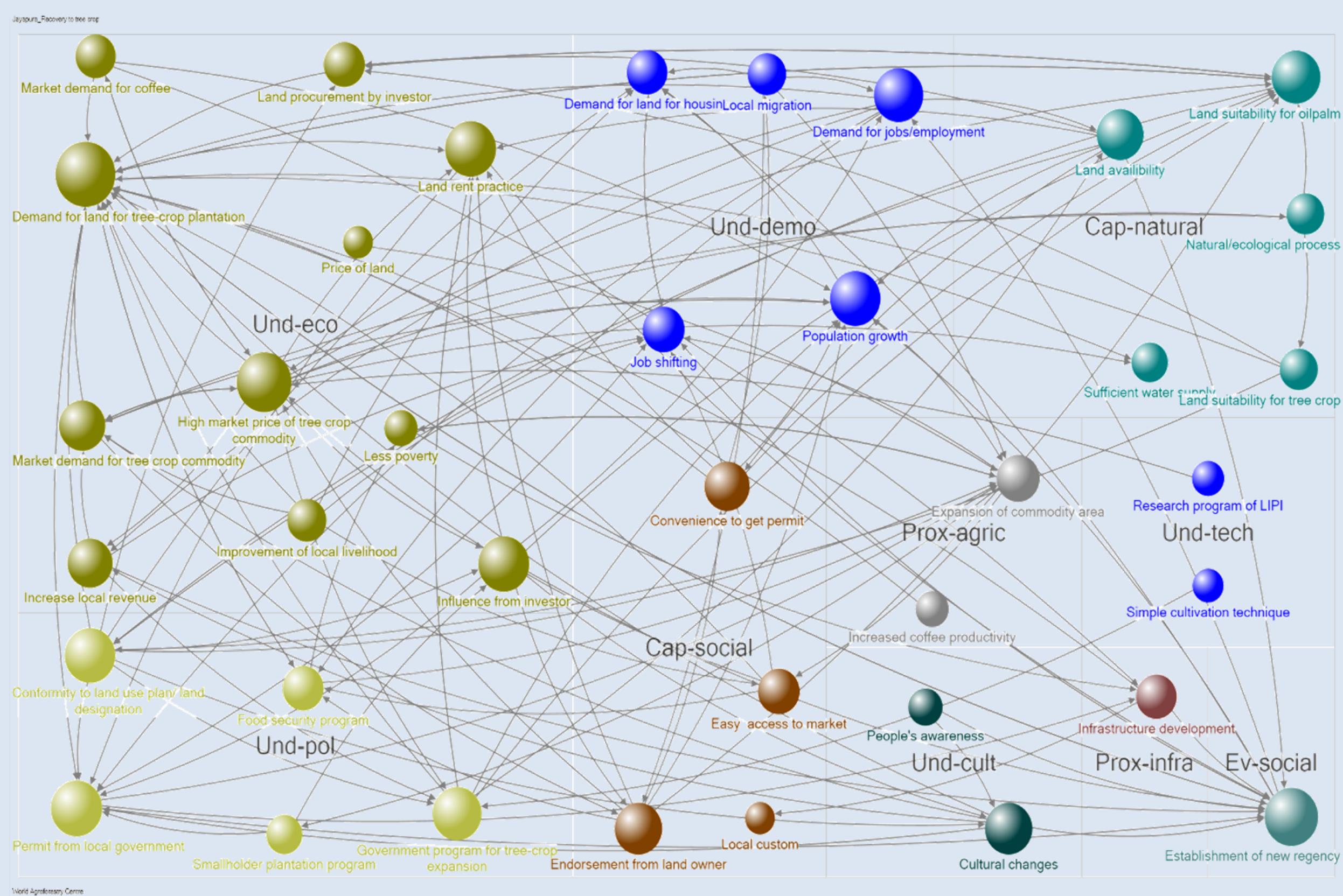
Legend
Forest to tree crop
Forest Cover
Others

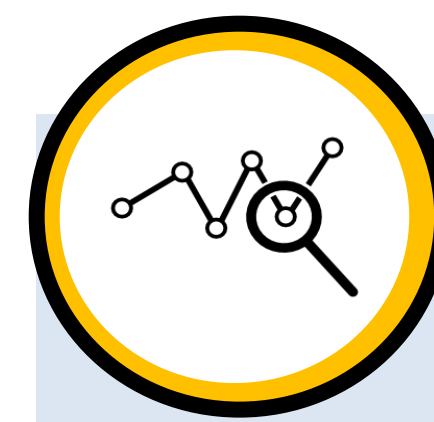## DOMINANT PATTERN OF LAND USE/COVER CHANGE

In this step, local knowledge on the causal processes of land use change and trajectories in an area or particular hotspots are captured. Proximate and underlying drivers of land use trajectories as well as the linkages among drivers are to be described. Key stakeholders/informants represent Local government, Academics, practitioners, NGO, local community. Data collected by conduct series of FGD and interview. They were experienced in land based sectors.

SOUTH SUMATERA
Abandoned Land 19%
Others 8%
Settlement 1%
Agriculture 3%
Agroforestry 5%
Treecrop 64%

EAST KALIMANTAN
Abandoned Land 23%
Others 1%
Settlement 3%
Agriculture 4%
Agroforestry 16%
Tree crop 53%

PAPUA
Abandoned Land...
Others 25%
Settlement 0%
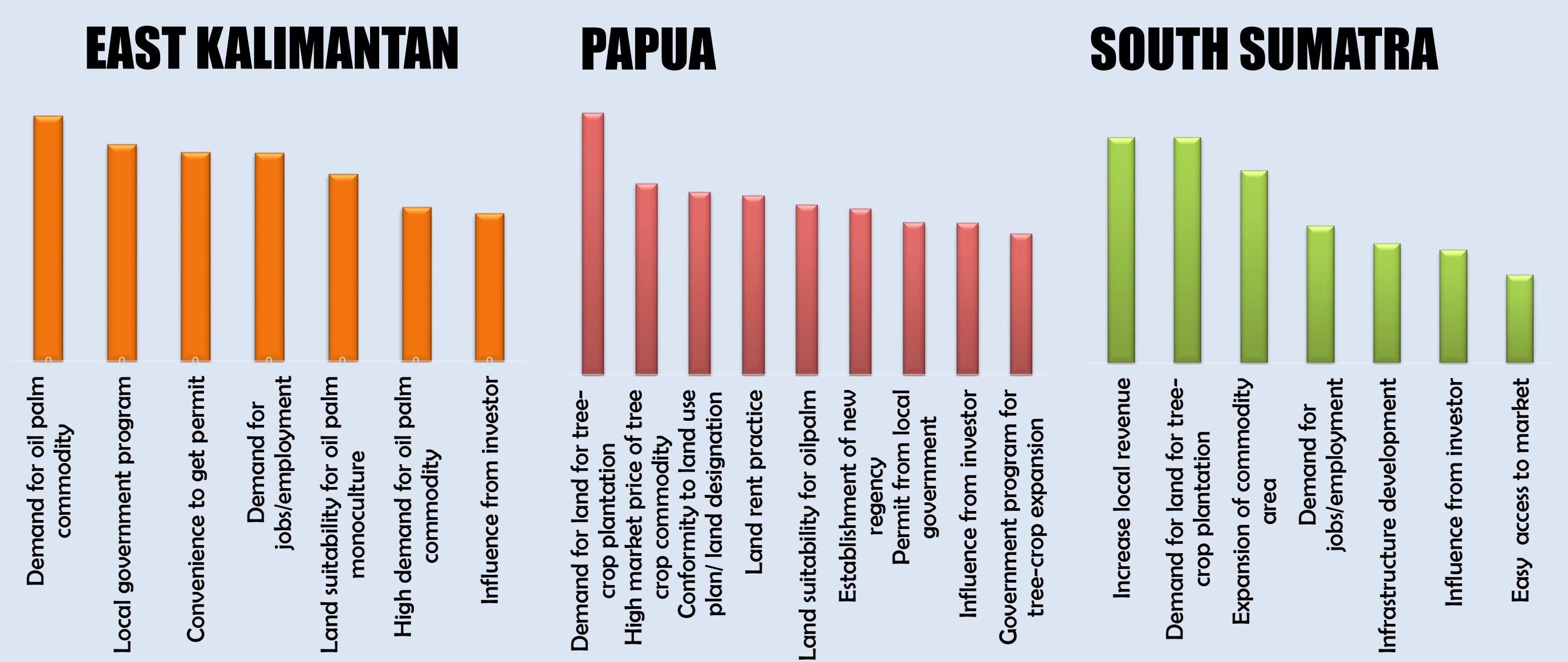Agriculture 2%
Agroforestry 45%
Treecrop 4%

NETWORK OF DRIVING FACTORS

Network of proximate and underlying drivers and their causal linkages using network analysis of forest conversion to tree crop. The outputs was a complex system of one trajectory. The circle's size means the strength influence of a drivers in a system. When it gets cut, it will affected others drivers. SS most influenced drivers was Increase local revenues, EK was Demand for land for oil palm and Papua was Demand for land for tree crop plantation.

INFLUENCES OF DRIVING FACTORS

EAST KALIMANTAN

- Demand for oil palm commodity
- Local government program
- Convenience to get permit
- Demand for jobs/employment
- Land suitability for oil palm monoculture
- High demand for oil palm commodity
- Influence from investor

PAPUA

- Demand for land for tree-crop plantation
- High market price of tree crop commodity
- Conformity to land use plan/ land designation
- Land rent practice
- Land suitability for oilpalm
- Establishment of new regency
- Permit from local government
- Influence from investor
- Government program for tree-crop expansion

SOUTH SUMATRA

- Increase local revenue
- Demand for land for tree-crop plantation
- Expansion of commodity area
- Demand for jobs/employment
- Infrastructure development
- Influence from investor
- Easy access to market

Network analysis results in a set of metrics to pinpoint the most influential factors and examine the network dynamics. Such metrics includes in/out degree of centrality and eigenvalues of centrality. The output is an estimated measure of the influence of a factor in driving a particular trajectory. systematic grouping of factors that adopts the hierarchical structure of driver analysis developed by Lambin and Geist (2002). Results shows those 3 provinces was set to Underlying – Economics. For SS, factor comes internally like the needs to be fulfilled. Unlike EK and Papua factor comes externally, in this case investor/market attracted by these provinces to conversion forest to tree crop.
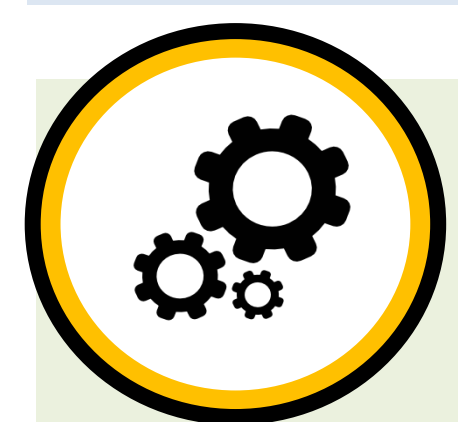
IDENTIFYING POTENTIAL POLICY LEVERS

The preliminary results were disseminated and discussed through series of stakeholder discussion to identify policy levers at multiple levels. This process aims to formulate scenario and recommendation of land use changes in 3 provinces within the landscape. This process includes several analysis to predicts the outcome of scenario using LUMENS (Land Use Planning for Multiple Enviromental Services) software.

POLICY LEVER TO ADDRESS LAND USE/COVER CHANGES

PLANNING UNIT	LAND USE SCENARIO	PROVINCES
Production Forest	Enrichment with local species for multipurpose tree species (MPTS) and non timber forest products in Production forest	South Sumatera
Estate Area (palm)	Enrichment tree species to be mixed with palm tree	
Production Forest	Maximize forest partnership in river border area	East Kalimantan
Limited Production Forest	Encourage sustainably forest production management (Hutan Produksi Lestari - PHPL)	
Convertible forest area	Planting Kayu Besi and Kopercus 15% from total zone area to restore land cover become secondary forest	Papua
Convertible forest area	Coffee agroforestry in abandoned land (15% from total area)	

CONCLUSIONS

Drivers results for forest conversion to tree-crop plantation were comes from underlying-economics. It might not be stopped because local government needs economics to develop their own regions. Despite currents conversion legal or illegal, sustainably forest management actions need to be taken. By knowing the drivers several actions were formulated to increase forest cover while encourage economics values

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