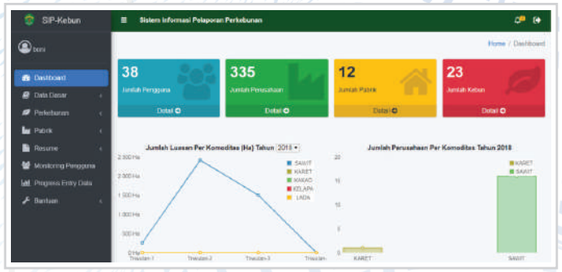
Applications that have been created, including:

a. East Kalimantan Estate Crop WebGIS (Geospasial Information System of Estate Crop Agency of East Kalimantan Province)
Legal Basis: Decree of the Head of Estate Crop Agency of East Kalimantan Province regarding the Establishment of a Web-based Estate Crop Database and Geospatial Information System Development Team in 2017.

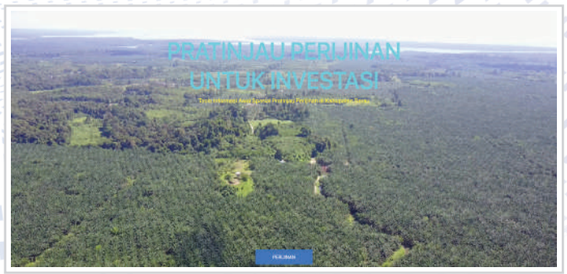
Program benefits :
1. Availability of up-to-date spatial data with high-resolution satellite images.
2. Availability of material for the formulation of policies on the use of estate crop area.
3. Assist the legality of community estate crop area to obtain certification.
4. Assist the analysis of high conservation value areas in estate crop areas.
5. Assist the estate crop fire prevention control system.
6. Assist the process of handling tenurial conflicts.



b. Plantation Reporting Information System (SIP-Kebun)

Program benefits:
1. Bridge the communication between the government and companies through company performance reports and providing feedback from the estate crop agency.
2. Provide company legality information.
3. Plantation activities (land clearing, nurseries, planting, maintenance, pest control),
4. Know the conditions of employment, plantation infrastructure, oil palm processing plant operations.
5. Know the number of handling conflicts in the estate crop sector.

c. Berau District Estate Crop Office WebGIS (http://139.162.35.154/sigbunberau)
Program benefits:
1. Able to find out the validity and expiration of plantation permits
2. Know the condition of land fires/hotspots
3. Conduct an inventory and validation of biodiversity data



d. Preview of Permit to Invest in Berau District (http://pratinjau.beraukab.go.id)
Legal basis: Decree of Head of Berau District no 213 of 2021 concerning Management and Use of "Pratinjau Application" for Land-based Licensing Process

Program Benefits:
1. An initial review of land-based permit applications using geospatial data.
2. Users can obtain data: spatial patterns, forest area status, overlapping permits, land cover, Land Suitability Classes, and Indicative Maps of High Conservation Value Areas (HCVA).

Transformation of Estate Crop Information System for Sustainable Indonesia

The estate crop sector plays an important role in the Indonesian economy. In 2021, the contribution of the estate crop sector to the national Gross Domestic Product (GDP) will reach 3.94 percent. The top five national estate crop commodities are oil palm, rubber, coconut, coffee, and cocoa.

Oil palm is the largest commodity developed in the estate crop sector in Indonesia. Currently, the national oil palm plantation area reaches 15.08 million hectares, the largest compared to other key estate crop commodities.

The Indonesian government pays special attention to the development of oil palm plantations due to its largest economic, socio-cultural, and ecological impacts, among other plantation commodities. Presidential Instruction Number 6 of 2019 concerning the National Action Plan for Sustainable Oil Palm Plantation 2019-2024 mentions the need to increase the capacity and capability of smallholders, finalize land status and legalization, use oil palm as new and renewable energy, and enhance diplomacy in achieving sustainable oil palm plantations.

Being a province that covers nine percent of the total national oil palm plantation area, or around 1.37 million hectares, East Kalimantan has implemented a series of strategies to support sustainable oil palm plantations. This is inseparable from the Kaltim Hijau (Green East Kalimantan) program declared by the Provincial Government of East Kalimantan in 2010. This program aims to encourage emissions reduction from deforestation and forest degradation, increase environmental indexes, and economic growth with sustainable principles. One of the transformation efforts towards a green economy is through the development of sustainable oil palm plantations. Oil palm is the main plantation commodity in East Kalimantan. The plantation area reaches 1.37 million hectares,

or about 88 percent of the total plantation areas in the province. The other four main plantation commodities are coconut, rubber, cocoa, and pepper. Based on data from the Central Statistics Agency (BPS), the contribution of the estate crop sector to the Gross Regional Domestic Product (GRDP) of East Kalimantan shows an increasing trend. In 2021, the estate crop sector will contribute 4.97 percent of the total GRDP, an increase from 2016, which was 4.43 percent.

The increased contribution to East Kalimantan's GRDP is also correlated with the expansion of oil palm plantations, which in 2021 will reach 1.37 hectares, an increase of about 210 thousand hectares since 2016. Oil palm plantations also provide employment for 218 thousand people in East Kalimantan.

Meanwhile, the Berau District Government, East Kalimantan, is also striving to maintain its forest area as a commitment to the Kaltim Hijau program. As the third-largest district in East Kalimantan, Berau has an area of 2.55 million hectares, or 75 percent of its total area, still covered with primary and secondary forest. Berau also has the Berau Forest Carbon Program (PKHB), a local government strategy to reduce carbon emissions from deforestation and forest degradation. This program also guides the Berau District Government in formulating development policies that align with sustainable natural resource management.

Berau, however, is still experiencing deforestation in the form of natural forest conversion. In the PKHB Strategic Plan, 70 percent of deforestation in Berau is triggered by forest conversion into oil palm plantations. According to the BPS, the area of oil palm plantations in Berau District will reach 257 thousand hectares in 2021. In 2019, according to data from the BerauEstate Crop Office , the area of oil palm plantations was only 135 thousand hectares.

The commitment of the East Kalimantan Provincial Government and the Berau District Government to green development is a good opportunity to support the sustainable management of oil palm plantations. The local government works closely with the Yayasan Konservasi Alam Nusantara (YKAN), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Climate Policy Initiative (CPI), National Development Planning Agency (BAPPENAS), and partners at the national, provincial and district levels in developing a low emission oil palm development program.

This initiative is expected to support the achievement of the Indonesian Government's social, economic, and environmental priorities for the Sustainable Oil Palm Management Initiative. This program also aims to ensure that the oil palm sector can thrive while respecting and protecting the economic, social, and environmental rights of local communities.

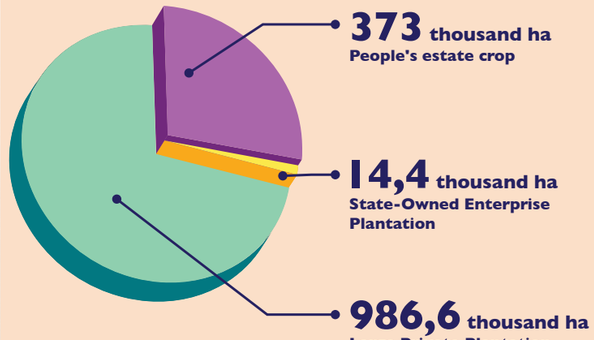
The Role of Data and Information Systems in Sustainable Oil Palm Plantations

Accelerating the implementation of sustainable oil palm plantations can be achieved with various supports. One of them is the development of data and information systems. The National Action Plan (RAN) for Sustainable Oil Palm Plantations also mandates strengthening data, coordination, and infrastructure. One of the special tasks assigned to the Minister of Agriculture is to strengthen the database on oil palm plantations in coordination with the Minister of Environment and Forestry, Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency, and Head of the Geospatial Information Agency.

The strengthening of the plantation data and information system can also be used to help resolve the status of land indicated in forest areas and peat ecosystems. The utilization of critical land in oil palm plantations can also be an effort to reduce greenhouse gas emissions. Another use of data and information systems is for handling plantation land disputes in other use areas (APL).

Constraints to data and information systems have had a major impact on plantation management systems in East Kalimantan. Geospatial data that has not been managed properly causes inaccurate area and position of theplantation . This condition can trigger land conflicts. Slow and non-standardized data collection systems can also be a problem. Another challenge is the low compliance of plantation management companies in reporting. In fact, the obligation to report business developments at least once a year to the licensor is already stated in the Plantation Law.

Composition of Oil Palm Plantation Ownership in East Kalimantan (2021)



Plantation Data and Information System Development

Regional laws and regulations on sustainable estate crop in 2018 state that the government is obliged to build, develop, and provide an integrated estate crop data and information system. The data and information system must be updated regularly and can be easily accessed by estate crop business actors and the community.

The Provincial Government of East Kalimantan has developed a database and a Estate Crop Geospatial Information System (GIS) since 2017. This program is part of strengthening governance, land use, and government capacity in planning and monitoring sustainableestate crop . This program is also part of the One Data, One Map Policy which integrates cross-sectoral spatial data (forestry, estate crop , agriculture, mining) in East Kalimantan.

The development of the data and information system helps both individual and corporate estate crop managers in reporting their business. Reporting data becomes faster and more efficient because it no longer requires piles of documents like under the conventional systems.

In East Kalimantan, until 2021, there were 342 Plantation Business Permit (IUP) holders on 2.53 million hectares of managed land. With the application of an integrated data system, local governments can also efficiently and effectively monitor plantation developments in large areas. Due to the impact of digitizing data and information systems, sustainable estate crop development is getting more transparent. The public can also participate in monitoring the development of estate crop businesses in East Kalimantan.

This good practice has great potential for replication on a wider scale. Thus, sustainable estate crop development programs can also have a greater impact.

Estate Crop Agency of East Kalimanatan Province collaborated with YKAN, East Kalimantan Regional Planning and Development Agency, East Kalimantan Communication and Information Office, Berau Estate Crop Office, Berau Research and Development Agency, and East Kalimantan Forestry Agency to develop a estate crop data and information management system.