



Creating Win-Win Solutions for Sustainable Landscape Management and Green Growth in South Sumatra

Summary

KELOLA Sendang (KS), an integrated sustainable landscape development project in South Sumatra, implemented targeted interventions from 2015 to 2020. The interventions were aimed at overcoming major challenges that hampered the province's ability to conserve biologically- and ecologically-important areas and reduce its greenhouse gas emissions.

The challenges were: 1) widespread land conversion that threatened the province's critically endangered wildlife (such as the Sumatran tiger and elephant) and vast peatlands; 2) a lack of financially-viable livelihoods and best management practices that would entice stakeholders away from more environmentally destructive business-as-usual activities; and 3) a lack of infrastructure for monitoring/policing of illegal activities (such as poaching and illegal land clearing).

KS's interventions were targeted at three groups: governments, companies, and communities.

With governments, KS interventions were aimed at strengthening landscape governance through supporting a hierarchy of vertically integrated institutions, facilitating the establishment of regulations that enable the institutions to manage landscapes sustainably, and devising a pathway for the institutions to integrate sustainable landscape management as part of South Sumatra's Master Plan for developing the province in support of the Governors' Green-Growth vision.

With companies, KS interventions were aimed at improving current peatland management practices covering water level management in concession lands to prevent flooding or the drying out of peatlands making them susceptible to fires, fire control for hotspots on concessions, and habitat protection and restoration.

With communities, KS interventions were aimed at overcoming economic, technical, and tenurial barriers to improve people's livelihoods

Introduction

South Sumatra's land conversion is being driven by industrial land use (from commercial plantations such as palm oil and rubber, timber, and mineral extraction sectors) and the Province is making efforts to balance such pressures with conserving its ecologically important wildlife and peatlands. The latter can, however, help stave off harmful effects of climate change such as recurring forest and land fires that have burnt through much of South Sumatra and impacted upon its levels of carbon emissions.

Successful sustainable landscape development interventions implemented in the province can provide valuable insights into how such interventions can benefit it and other areas in Sumatra, as well as whether such interventions should then be scaled up and extended to more areas to improve conservation and emissions reduction efforts.

In South Sumatra, KS focused on implementing interventions aimed at resolving challenges that have impeded conservation and emissions reduction efforts. The challenges were: 1) widespread land conversion that threatened the province's critically endangered wildlife (such as the Sumatran tiger and elephant) and vast peatlands; 2) a lack of financially-viable livelihoods and best management practices that would entice stakeholders away from more environmentally destructive business-as-usual activities; and 3) a lack of infrastructure for monitoring/policing of illegal activities (such as poaching and illegal land clearing).

KS intended its implementation processes to provide a replicable blueprint of what would work to get multiple stakeholders to align around core tenets of responsible industrial production, improved economic growth through sustainable livelihood opportunities, and a resilient natural environment that can consistently provide crucial ecosystem services.

To achieve this KS worked with three groups – governments, companies, and communities – to outline how alignment around the core elements of sustainable landscape management could be translated into a series of steps and processes that the three groups could adopt.

Interventions for Governments to Improve Environmental Governance

In South Sumatra, KS secured government buy-in as the provincial and district governments were looking for a forest governance model that could prevent the occurrence of devastating forest fires while also providing the province with jobs and new economic opportunities.

Securing government buy-in for an integrated sustainable development project like KS was fundamental in getting companies and communities to support activities that promoted development alongside conservation efforts. Government buy-in for KS signalled that the authorities in South Sumatra were ready to support sustainable development activities while also potentially willing to put pressure on local industry to end destructive business-as-usual practices. Companies and communities collaborative support also indicated their willingness to be more compliant.

- **Institution building**

At the provincial level, KS and the South Sumatra Government set up the Project Supervisory Unit (PSU) and Project Implementation Unit (PIU) to manage coordinating processes among governmental units associated with implementation of sustainable development. The Unit was established under the South Sumatra's Governor's Decree ¹ and mandated to serve as the coordinating body in developing a Master Plan for sustainably developing Sembilang-Dangku Landscape from 2018 to 2028

¹ Decree No. 332 of 2017 on the Formation of Project Supervisory Unit (PSU) and Project Implementation Unit (PIU) for Sembilang-Dangku Sustainable Landscape Management



This Landscape, which is located in the Musi Banyuasin and Banyuasin Districts in South Sumatra, covers an area of around 1.6 million hectares.

At the district level, KS supported the establishment of Regent Decrees² that provided a legal basis for the functional of the Green Growth Working Groups in Musi Banyuasin and Banyuasin. These Groups comprised a cross section ranging from policy departments to technical teams and private sector companies. The Groups served, and still continue to serve, as platforms for integrating sustainable development principles into district government policies and programs. For instance, the Banyuasin Group worked on developing an eco-tourism programme that would provide new jobs while conserving a part of the district (Alangan Island in Banyuasin); the Banyuasin District is expected to allocate IDR 1 billion to develop the programme after KS exits.

On the ground, KS facilitated partnerships between Forest Management Units (FMU) and local communities to ensure continuity of KS's field activities. FMUs are local representative government agencies that oversee Indonesia's forest management. This made them best-placed for monitoring activities (see Interventions for Improving Spatial Planning and Monitoring) and running sustainable development schemes like social forestry (see Interventions for Sustainable Livelihoods and Conservation).

PSU, PIU, Green Growth Working Groups, and FMUs represented a hierarchy of government entities that could continue with the sustainable development activities initiated by KS and implemented at wider scale at the provincial, district, and village level. This meant that activities started with one district could be scaled up to include other districts whilst providing for a greater standardisation and monitoring of activities across the province.

² Regent of Musi Banyuasin Decree No. 68 of 2018 on the Formation of Green Growth Working Group in the District of Musi Banyuasin and Regent of Banyuasin Decree No. 105 of 2018 on the Formation of Green Growth Working Group in the District of Banyuasin

- **Enacting regulations**

Through its relationship with government institutions, KS support the enacting regulations that supported sustainable development efforts. These regulations typically spelled out how and when governments can plan and budget for such efforts. Table 1 lists of the regulations KS facilitated in South Sumatra.

Table 1: Regulations in South Sumatra facilitated by KS
<p>Governor Regulation No. 68 of 2018: Provides technical guidelines for local government agencies to organise, plan, and maintain budgets for managing peatlands.</p> <p>District Regulation (<i>Peraturan Bupati</i>) No. 88 of 2019: As a follow-up to the first two regulations, this provides Musi Banyuasin District with technical guidelines on the establishment of district peat rehabilitation team (TRGD) for overseeing the protection and sustainable management of peatlands.</p> <p>Below are other regulations supported by the KELOLA Sendang project:</p> <ul style="list-style-type: none"> • Governor Regulation No. 16 of 2017 on Green Growth and Eco-Region Landscape Management Partnership Institution in the Province of South Sumatra • Governor Regulation No.21 of 2017 on South Sumatra Provincial Green Growth Master Plan • Governor Regulation No. 19 of 2017 on the Acceleration of One Map Policy Implementation in the Province of South Sumatra • Governor Decree No. 452 of 2017 on Green Growth Plan Organisational Structure and Eco-Region Landscape Management Partnership Institution in South Sumatra • Governor Decree No. 527 of 2017 on the Formation of South Sumatra Provincial One Map Policy Acceleration Team and Implementation Team • Governor Decree No. 154 of 2018 on the Formation of Social Forestry Acceleration Working Group in the Province of South Sumatra Governor Decree No.233 of 2018 on Prevention of Conflict between Human and Wildlife

- **Sustainable landscape master planning**

KS started work on the Sembilang-Dangku Landscape Management Partnership Master Plan by conducting a series of focus group discussions, consultations, and workshops with various stakeholders from the government, private sector, and civil society. These evolved into the development of public-private partnerships and forums supporting the management of vital areas: 1) the Peat Hydro-logical Unit of Merang-Ngirawan; 2)ecosystem rehabilitation of Dangku; and 3) a buffer zone in Berbak Sembilang National Park biosphere reserves.

Interventions for Companies to Produce Sustainably

Companies in South Sumatra in general and in KS landscape in specific have been driving much of the economic activity in the province as they managed a large proportion of land and influenced how commodities are produced. Engaging them to improve their management practices would therefore be necessary to address environmental degradation at scale.

KS engaged companies with concessions to improve their management practices for water, fire, and habitat protection and restoration. This translated into three interventions: 1) creating an Integrated Water Management System (IWMS); 2) improving management of High Conservation Value (HCV) areas; and 3) carbon banking.



- **Integrated Water Management System (IWMS)**

Ensuring land management practices resulted in the reduction of greenhouse gas emissions involved developing a system that could be used to identify where to build canal blocks and monitor their effectiveness; increase water tables for improving yields and preventing carbon emissions from dried peat; carry out flooding to fight fire or restore peatland; and monitor peatland subsidence and greenhouse gas emissions.

KS introduced such a system, dubbed the Integrated Water Management System (IWMS), to 4 companies operating within the Peat Hydrological Unit of Merang-Ngirawan. These companies suffered considerable losses whenever fires tore through their concessions and were eager to find a way to stop the fires. KS worked with various academic departments at the Bogor Agricultural Institute (IPB) in collaboration with KS building upon two existing reporting tools SWAT and MODFLOW (Kim et al. 2018), the Peatland Restoration Agency (BRG). This enables the integration of surface hydrology model SWAT (Soil & Water Assessment Tools) (Arnold et al. 2012) and groundwater flow model MODFLOW (Langevin et al. 2017). These systems to measure peat depth (to ascertain which areas needed restoration and protection); and to identify what has been planted where (mapping areas can help identify growth/degradation patterns associated with the related crops/vegetation).

In future, with consistent data inputs from the companies, IWMS will be able to help stakeholders identify problem peatland/fire-prone areas that need rewetting, revegetation, and revitalisation of livelihoods. IWMS has been scaled up and plugged into provincial databases.

- **Supporting the Rehabilitation of HCV areas**

KS targeted companies operating in South Sumatra (in Musi Banyuasin and Banyuasin Districts) with concessions that had HCV areas. The companies are mandated by law to conserve these areas. However, the lack of knowledge or experience with maintaining HCV areas could result in the areas getting degraded and becoming vulnerable to fires. KS implemented two complimentary methods to assist companies with HCV restoration and protection namely providing technical assistance for the replanting of degraded areas and the introduction of a bespoke monitoring system SMART previously only used to patrol protected areas.

KS worked with two companies (PT. Hindoli and PT. Pinago) to plant local tree species in their HCV areas. PT Hindoli, an oil palm concession, saw almost 95% of its HCV area destroyed by fires in 2015. The partnership with KS meant that PT Hindoli could restore its burnt areas while also contributing to further research and analysis to inform best practices for the future restoration of degraded and burnt lands in company concessions. Experts from the Indonesian Institute of

Sciences (or LIPI), a government research agency, were recruited to provide technical expertise for the rehabilitation programme involving the two companies.

KS also introduced a Spatial Monitoring and Reporting Tool or SMART to help companies better monitor for threats such as fires or poaching (see Interventions for Improving Spatial Planning and



Monitoring). KS encouraged companies to use SMART as the tool that could help in increasing the rate of detections of illegal activity. This could lead to a downtrend in forest threats. KS collaborated with 7 partner companies covering 305,419 ha of the project landscape including HTI businesses, palm oil plantations and PAN/RAP carbon monitoring systems. By 2020, all 7 companies funded SMART patrol activities independently assigning specialized staff who have been trained by the project to undertake the work.

- **Carbon banking**

To encourage companies to invest in business ventures that move away from clearing land and to those that restore lands, KS facilitated the initial stages of a performance-based finance model, the Plan Vivo scheme. Through this model land which is sustainably managed can be sold as carbon stocks through a certification process. Each certificate represents the reduction or avoidance of one metric tonne of carbon dioxide plus livelihood and ecosystem benefits.

Under the Plan Vivo scheme, FMUs worked with communities and companies to plant agroforestry plots. This involved the planting of native species that enriched the peatlands but were also cash crops. The cash crops included species such as sugar palm (*aren*), which can be harvested to produce palm sugar; swamp rubber (*jelutung*), which can prevent peat oxidation while also providing income-generating latex; and native timber species like “*meranti-rawa*”, “*rengas*”, and “*ramin*”. Plan Vivo

participants could also intercrop peat with non-native cash crops that have shown to be well-adapted to growing in peat such as “*Liberica* coffee”, areca palm, pineapple, and jengkol.

In the longterm, Plan Vivo will enable FMUs to sell the carbon stocks contained in restored/ conserved peatlands on the carbon trading market in the form of carbon credits.

Interventions for Communities to Engage in Sustainable Livelihoods and Conservation

Communities in South Sumatra ran the risk of engaging in the unsustainable use of local natural resources due to a lack of alternative financially-viable livelihoods, a lack of knowledge about environmentally-friendly practices, and/or a lack of legal access to land. KS’s interventions for communities were therefore focused on overcoming economic, technical, and tenurial barriers to improve livelihoods through support for the sustainable management of the landscape.

- **Overcoming economic barriers to sustainable landscape management**

Value Propositions	Interventions
Demonstrated and made accessible to communities across the landscape green growth livelihood strategies	<ol style="list-style-type: none"> 1) Responsible sourcing: KS worked with 1,560 rubber and oil palm smallholders to implement training in environmentally sustainable farming techniques. KS aimed to link smallholders with improved practices to buyers or expand their market access and offer them economic incentives as responsibly sourced rubber and palm oil sells at a higher price. 2) Community business cooperatives: To increase income and strengthen community livelihoods, KS developed cooperatives based around environmentally friendly businesses, such as rubber trading, honey harvesting and agroforestry. KS introduced to member’s best management practices related to their trades and taught relevant business skills such as branding, better packaging and book keeping.
Created equitable and sustainable community land governance models	<ol style="list-style-type: none"> 1) Conservation partnership for land conflict resolution and ecosystem recovery: KS brokered a truce between local communities (over 900 households that had settled in Dangku Wildlife Reserve, a conservation forest) and South Sumatra’s Natural Resources Conservation Agency (BKSDA), a unit of the Ministry of Environment and Forestry, to form a Conservation Partnership (CP). CP is a government-sanctioned forest management scheme established in 2018 to address conflicts over land in conservation forests by giving residents temporary status to stay and work in the area in return for managing the forests with local government agencies. Previously, such residents would have been considered illegal and faced eviction. 2) Plan Vivo: see section on Carbon banking.

- **Overcoming technical and tenurial barriers to sustainable landscape management**

Value Propositions	Interventions
Created community-led conservation and restoration approaches for forests, peatlands, and mangroves	<ol style="list-style-type: none"> 1) Community-based fire management: KS facilitated partnerships between villages and government agencies like Forest Management Units (FMUs) and Manggala Agni (fire brigades) as well as research institutions. The government agencies provided the communities with fire preparedness training while the research institutions helped them understand the hydrology of their surrounding areas so they can better monitor water tables and identify which areas to rewet and revegetate. One village, Muara Medak, has since formed its own dedicated team to monitor for water table and fight fires called REPAIR (<i>Regu Peduli Air</i> or Water Care Squad). 2) Social forestry: KS facilitated the successful application of three villages in obtaining a social forestry permit. Social forestry presented an entry point for KS and government partners to engage villages in sustainable development, a core requirement of the permit. For the peatland village of Muara Medak, KS devised a management plan that focused on fire preparedness, habitat restoration, and environmentally friendly businesses. For Lubuk Bintialo, a village with protection forests susceptible to illegal logging and poaching, KS devised a plan that focused on developing non-timber forest products, such as fruit trees, and landscape monitoring as well as forest honey and stingless bee honey harvesting. For Karang Sari, a village that serves as a buffer zone for Berbak Sembilang National Park, KS devised a plan that clearly demarcated the village’s areas for agroforestry and habitat restoration, and expanded the market reach of the village’s existing cooperatives that sold agroforestry and mangrove honey products.
Created networks for increasing environmental awareness	<ol style="list-style-type: none"> 1) Green Generation cadres: KS conducted environmental education and awareness activities with 2,357 participants from various villages over the course of two years. These activities were aimed at raising communities’ awareness of proper waste management, biodiversity conservation and human-wildlife conflict mitigation. By 2020, the activities had spawned the creation of Green Generation cadres, an organisation comprising of young members from the various schools and communities. The cadres have since established a waste bank, where villages can deposit household garbage that the cadres recycle.

Interventions for Improving Spatial Planning and Monitoring

Stakeholders in South Sumatra had limited capacity to access and use spatial planning and monitoring tools in an efficient and inclusive way that responded accurately to local conditions and needs.

Villages within KS’s jurisdiction initially required the capability to map their village border and areas of importance (economic activity zones, high conservation value zones, conflict/opportunity zones etc). This meant it was difficult for them to gain or present the information needed to protect their land rights; were not in a good position to better inform state policies about land use; and could not assess changes in their environment in a critical manner so as to propose solutions.

Oil palm and timber plantations needed a standardised system for storing accurate information that could be used to monitor animals and their land, and consequently identify threats such as fires or poaching in their concessions areas.

Governments in South Sumatra were also looking for a way to improve their spatial planning information system making it more transparent and participatory.

In response to this KS focused on implementing and improving the use of three spatial planning and monitoring tools that can overcome such challenges and make KS's sustainable landscape management interventions more efficient in attaining their conservation and emissions reduction aims.

- **SITARUNG (Spatial Planning Information System)**

Since South Sumatra has a mandate for synchronising spatial planning activities across the province and aims to roll out the system to various districts, KS reviewed the human resources capacity in the districts as well as the technical resources the districts would require to operate SITARUNG locally. Participating districts then implemented KS's resulting recommendations.

When functioning at its optimum, SITARUNG's open source nature means the public, as well as spatial planners and companies, can access information and monitor spatial planning implementations. Such transparency would allow people to discuss, and even challenge, information about the appropriateness of land-use plans and how to adjust them. It would also establish more clearly threats and risks to areas, and provide context for why ecologically important areas need to be protected. At the same time, governments can benefit from such discussions as they provide opportunities for identifying threats early, and where and with who trade-offs need to be negotiated.

SITARUNG also aligns standards for attributing and mapping data with those set by the national One Map System. This harmonisation of standards would allow provincial and national agencies to use a similar source of shape files, maps and "language" when talking about and assessing geo-spatial data. This would make land-use plans easier to understand and allow for more accurate comparisons and assessments of land conditions.

- **Community Based Monitoring and Information Systems (CBMIS)**

By ensuring the accessibility of SITARUNG, local knowledge, experience, and aspirations can be integrated into formal land-use planning. This not only improves transparency but also local land-users to feel ownership of the process. To accomplish this integration, KS worked with local communities to develop a systematic way of gathering and publishing information about the communities through CBMIS. KS first facilitated participatory community land use planning in 21 villages. This involved the development of a village land use plan that detailed areas of importance (high conservation value zones, where human activities are carried out, conflict/opportunity zones etc), analysed them to identify possible future spatial scenarios, and set out a roadmap for implementing a chosen spatial scenario. KS then facilitated with communities, a methodology for recording and reporting vital information. For instance, KS worked with districts to come up with reporting indicators for monitoring purposes such as conservation violations, forest/land fires, and land clearing. The communities then used the indicators as a basis for monitoring and reporting performance at the landscape level. Villages could then submit their reports to a KS initiative called Monitoring, Evaluation and Reporting (MER) System, named SIMOLA, which feeds into spatial planning portals like SITARUNG. KS conducted CBMIS outreach with 21 villages in South Sumatra. 14 villages have started submitting reports to MER.

- **Spatial Monitoring and Reporting Tool (SMART)**

Aside from communities, companies overseeing plantations and concessions can also serve as frontline monitors of changes in the environment. KS customized software add-ons for concessions to monitor HCV and HCS areas. This was developed to be used with an existing spatial monitoring and reporting tool known as SMART. SMART was also used in the landscape by government agencies, such as Forest Management Units (FMUs), to monitor and patrol areas of high biological and ecological importance as well as high conflict ones. SMART combined software, training materials, and patrolling standards to help users monitor animals and land areas, identify threats such as fires or poaching, and make patrols more effective.

KS trained forest rangers from 2 FMUs and representatives from 7 companies. They were trained to gather data on wildlife and threats, store the data using the software, and analyse reports to better plan and target protection efforts. Since KS got involved, FMU Lalan-Mendis has issued a decree to establish a SMART Patrol team. This decree included the creation of a dedicated organisational structure for patrol and staff members who would be responsible for implementing SMART processes in the field. Also, 7 companies have committed funding to starting their own SMART Patrol teams and the requisite infrastructure. Some also voluntarily submitted assessment of their lands containing HCV or high carbon stocks, increasing public knowledge and data of private lands, where previously had been scant or unavailable.

Conclusion

It is likely too soon to assess the achievements of KS's interventions as many were still in their initial stages at the time of writing this brief. Positive results will continue to materialise into the foreseeable future. For the time being, integrated sustainable development projects like KS remain instrumental in showing how systemic challenges like land-use conversion can be addressed as they shed light on how diverse stakeholders can come together to create innovative solutions. In that regard, KS has identified gaps and challenges to solving problems at the large scale while also pointing to the different roles that stakeholders can take on to overcome them. Moving forward, stakeholders will need to continue to monitor for which interventions have been effective and which require adjusting to keep on delivering emissions reduction and conservation at scale.

What is KELOLA Sendang?

KS is a partnership of government, business, communities, and civil society aligned around common interests in conservation, supply chain sustainability, and sustainable economic development. The advantage of such a partnership, also known as a sustainable landscape management approach, is that it is focused at the political level, where land use decisions get made and enforced. It is also concerned with bringing together as many actors as possible rooted in or operating from a defined geographic area since any effort to meaningfully address sustainable land-use and climate change mitigation must first address the needs of local actors. By advancing careful land use planning of production and protection areas with geographically tailored interventions, the partnership can simultaneously address challenges like the conservation of endangered species, deforestation and rural poverty. The ultimate goal of this multi-stakeholder project is to create a government led blueprint for sustainable landscape management which can be upscaled and continued into the future, paving the way for the Government of South Sumatra to achieve its low emissions target and Green Growth Vision.

KS operates in the Sembilang-Dangku landscape of Musi Banyuasin and Banyuasin Districts in South Sumatra, an area that covers around 1.6 million hectares.

