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**UPSTREAM TO DOWNSTREAM: JURISDICTIONAL SUB-LANDSCAPE  
APPROACH TOWARDS SUSTAINABLE LAND USE PLANNING**

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### **Abstract**

Landscape approach is increasingly implemented aimed to improved land-use governance. It is seen as a promising approach addressing the ideal goal in conservation, and environment protection while supporting development. Nonetheless, the implementation is challenging. There are cases of programs were discontinued when a project was withdrawn, due to large coverage area, transboundary, high cost or poor coordination with formal agencies. Aimed to have a long-term impact on land-use improvement, we develop a framework implemented at the sub-landscape as part of a bigger landscape. The framework then adopted into three tiers of processes, conducted in parallel. The tiers include a community participation on a spatial planning process through zoning to recognize and redefined conflicted land use zones. Correlate the program with existing government planning instruments is also key. The goals are to improve stakeholders coordination between the communities, private, government, and establish a social cohesion on the same environmental services. We study the implementation at two sub landscapes in Indonesia with two specific focus, a watershed in Aceh Province and mitigation for fire-prone peatland in Central Kalimantan. Regardless the context specificity, these landscapes are representing Indonesia and other similar countries with common land-use issues.

### **Key Words:**

**Indonesia, landscape approach, participatory mapping, watershed, zoning.**



## **Introduction**

Indonesia is among countries in the world that are rich in biodiversity with massive carbon storage pool from its intact forest and peatland. Sumatra, Kalimantan, and Papua are the islands with a great representation of forests and wetland in Indonesia. The total area of peatland and forests in this three islands serving as the largest tropical peat carbon pool (Betha et al. 2013; Page et al. 2010) and the third largest remaining humid tropical forest at the global scale (Broich et al. 2011). However, this area is in an alarming state on rapid deforestation and land degradation due to private sector activities on mining, expansion of agro-industry, timber, and local community agriculture practice (Chomitz and Griffiths 1996; Hansen et al. 2010; Sunderlin et al. 2005).

In the effort towards a balance of natural conservation and development improvement, increasing number of the non-government organization (NGOs), government, and private sectors seek to find common ground to implement an effective approach. Lambin et al. (2014) argued effective intervention should be able to address the particular issue, to resolve and deliver positive changes on the ground. The landscape-based approach acknowledged for its methods to achieve a win-win solution, especially on land use management improvement. This approach increasingly implemented by the government, NGO's, and private sector to achieve a sustainable development (Proforest 2016). Integrated conservation development project (ICDP) and Forest Landscape Restoration (FLR) project are the examples of projects aimed to incentivize affected stakeholders within and outside of a landscape as part of the effort to conservation (Sayer; Dudley et al. 2005). At the government level, in Indonesia agencies also increasingly implementing landscape approach despite its sectoral target. For instance, Ministry of Forestry refer to watershed for delineating administrative area on forest management, National Planning Board (Bappenas) looking at transboundary connectivity across district and provincial level on infrastructure and development for further improvement, and Ministry of Villages and Transmigration (Kemendes) clustering villages for development based on the similarity among villages on culture, commodity, and natural environment.

Nevertheless, there are pro and cons of the landscape approach. On the positive side, it is promising to deliver the equitable outcome on economic enhancement and development while maintaining forest and nature resource management to impacted stakeholders such as local community, private sectors, and the government (Reed et al. 2016). This approach accentuates



the acknowledgment of different stakeholders, and their land utilization practice is interrelated and mutually influenced overall coverage area and the outside (Sayer et al. 2013; Frost et al. 2016). In bridging difference among stakeholders, the approach also promotes participation, to build understanding and reconcile issues between individual and collective strategies between local communities, the private sector and government at the landscape level (Pfund et al. 2011). For those reasons, the approach demonstrates its strength to define the pattern of common issues in one coverage area. Thus, for replicating purpose, it is more promising to implement the same intervention within the same landscape.

The challenges of landscape approach varied in different project implementation. A project with landscape-based approach would be covering a large area and sometimes transboundary. Thus, data collecting that represents a large area will be challenging (Groot et al. 2010). In the area that employs a decentralization government system, for example, every administrative government has independent authority and different interests and might work in silos. Another challenge is landscape approach for conservation effort in particular needs higher commitment and time (Dudley et al. 2005). Forest frontier community for example used to practice traditional agriculture such as slash and burn, therefore intensive education and awareness is a priority attempt to change behavior towards better land utilization. Then, build linkages among stakeholders, and intervention is a big task beyond project life, mostly five or ten years. Therefore, it is common to find interventions in one landscape were conducted sparsely in a different location, without connectivity between one to another for replication. At the time a project ended, the period of intervention implementation is too short to be understood and continued by the government and community.

At that point, we are questioning when a project ended, how to assure the sustainability of the approach to be maintained. Depart from this concern; this paper aimed to introduce a landscape approach at smaller coverage, focusing on sub-landscape. Focusing on smaller landscape might help implementor focus on facilitating and guiding the stakeholders to work together, to replicate the program of intervention.

The case study in this paper based on an intervention for low emission development, protection of biodiversity and environment conservation conducted by USAID LESTARI in three provinces in Indonesia that were implemented based on the landscape categories; Leuser landscape in Aceh representing tropical forests, Katingan-Kahayan landscape in Central Kalimantan representing peatland and Papua Landscape representing both mangrove and tropical forest. Each



landscape facing different issues; forests fire in Central Kalimantan, and in Aceh and Papua the strongest issue is related to water catchment, wildlife, and biodiversity conservation. This landscapes also has different cultures, biophysics, and governance, in particular, Aceh and Papua that implementing autonomy system.

In Aceh landscape, 70% of the total area is forested. Since early 1970, the forests area has been allocated as production forest, protected forest, and the National Park of Gunung Leuser (TNGL) granted in the 80's. In the landscape view, water catchment sourced from upstream forest play an important role as an administrative boundary for forest management unit (KPH), the source of livelihood (freshwater fisheries, agricultural activity) and supply for community drinking. However, due to poor land-use management around water catchment and the forests area, inevitably, flooding become an annual incident. The second site is in a district of Central Kalimantan province, located at ex-mega rice project (MRP), and adjacent to the National Park of Sebangau (TNS). The project area is part of 440,000 hectares of the total area of MRP where central peat domes are located (USAID LESTARI, 2016). In 2015, this area experienced a massive peat fire where emissions were highest and accounting 27% of all forest and land fires in Central Kalimantan (USAID LESTARI, 2016). Other than environmental impact, peat fire negatively affecting health, loss of livelihood, and economically costly (World Bank, 2015).

### **Principles for landscape-based approach**

Understanding the challenges and potential of landscape approach towards a balance livelihood, conservation, and development, this paper elaborate the importance to go back to basic elements that will support the long-term improvement on land use management. As the effort to implement this approach, we developed a framework consists of five principles to be considered in landscape-based approach

#### **1. NURTURING INTERCONNECTIVITY IN SECTORAL MINEFIELDS**

Implementing landscape approach is expected to work with stakeholders with different interest, the authority of government sectors, community, and private business. It is common to find these actors work independently and in silo based on its sectoral interests. The establishment of a communication platform such as multi-stakeholder Forum (MSF) in a landscape-based project is essential in the first phase of its operation. MSF functioned to establish mutual understanding, respect, and trust amongst those land use institution. The basic aim is to find common-ground among different interests of stakeholders to collaborate in the management of the environment



and natural resources. On improving land use management, nurturing connectivity is a priority. As shown in a case of a World Bank project, PLANAFLORO in Rondonia, Latin America in early 80's (Mahar and Ducrot, 1998). The project implemented zoning approach to improve land use management in the frontier area. Although it gave a mixed result, it brought an understanding that coordination among all stakeholders (government, impacted community, concessionaires, and stakeholders outside the project coverage) is the most essential. Improving the communication, information exchange and collaboration between stakeholders will help to minimize negative externalities. As an example, an MSF established for a watershed area. Members should have a similar understanding that the watershed is one ecosystem and provide services life being. MSF could be the facilitator to assist stakeholders in understanding the importance of watershed quality. Such as to build the awareness the watershed may or may not affecting the future livelihood of the downstream community if extractive production at the upstream were uncontrollable, risking a natural disaster such as floods. Therefore, MSF should be an open space where at the forum, stakeholders have the same right to raise concern, offer a solution, and sharing information.

## **2. Informing Existing Formal Planning Instruments**

A strategic step in landscape approach is to acknowledge existing formal regulations and planning instrument. In Indonesia, the planning instruments are mandatory at each administrative level, specific sectors for a different function of development priority. For spatial planning, each government administration has its own planning, at the national level, provincial level, district, and village. At the sectoral level, for instance, the instruments might focus on urban planning and forest management. These plans were developed for medium to long term development plan through an iterative participative expert of Strategic Environmental Assessment (SEA).

These level of development plans are like the vessels that facilitate the development process to be focused and on target. Nevertheless, this planning instrument sometimes disconnected with another, which may slow down the development process. Some of the examples, at the village level in Indonesia, RPJMDes is the planning instrument at the lowest level. RPJMDES developed to manage the village funding. It is mandatory as the tool for district government to consider the development funding, as proposed on RPJMDes. Nevertheless, district government has no authority over how the village manages its fund. With substantial funding to be spent every year, village tends to focus on current needs such as infrastructure and public facilities improvements such as transportation access, or community meeting hall. The district government itself also owned a planning instrument, RTRWK (district spatial plan) that has allocated priori-



ty area with specific and detailed plans to guide local development. RPJMDES is an independent planning instrument solely for a village priority on the development. It is rarely referring to the RTRWK programs and plans in a particular area where the village's located. Thus, in the area allocated for protected forest, a village within this area would propose a program that involves further forest clearing, such as agriculture pathways to improve the community's economy.

As an implementer of intervention, it is sensible to avoid developing new masterplans that might not adaptable to existing instrument or not acknowledged by the running government. In countries with decentralization system, the autonomous unit that runs the government and development at the local level have the authority on governing regulation, and it might be different to the central government. The second principle lead us to next step of iterating the planning instruments with the sub-landscape program.

### **3. In-Sync With The Jurisdictional Entry Points**

As mentioned above, the planning instruments is a formal government reference on development. A province and district level spatial planning is one of the keys as it contains the development plan at each allocated area in particular forest area, private area, and cultivation area. At the micro level in forest area specifically, the management has its specific plan. This forest area is authorized to different board and agencies based on function; Forest Management Units (KPH) for the protected and production area, Conservation office (BKSDAE) for the national park. Both management unit has a different type of forest governance and planning based on coverage area.

Harmonizing the intervention with government existing plans will give jurisdictional entry points that will ensure the continuity of program post project. For example, linking a conservation program in the frontier village to the development program. There is a mandatory for every village to have a mid-term development plan's document (RPJMDES). In the RPJMDes process, it emphasizes the participatory process on development planning and requires to map village asset and potential. Align with this, Government of Indonesia also has been encouraging a spatial planning process trough detailed village mapping in 1:5000 scale map. On landscape perspective, it is a promising entry point to improve land use management in the frontier areas. Mapping on a smaller scale also invites site-specific investment through the mobilization of the locals, increasing their social and knowledge capital among stakeholders.



On the case of frontier areas in Indonesia, working in sync to the existing instruments will help to achieve an improved land use management. Since the 70's, the central government has zoned forests function based on vegetation coverage and biophysics factor. During the process of allocation, the existence of communities living in the forests was not formally acknowledged by the government. It caused recent escalating issues on tenure insecurity, particularly on community land use for agriculture and livestock grazing within the forests zone. Despite forest allocation for protection, conservation, and other land use, the needs on land are increasing. As an example, adopting spatial planning mapping on the RPJMDes process will encourage the participatory involvement and be able reflecting activities on the ground to produce rationalization of village boundary, land-use, and future development

#### **4. Developing Sub-Landscapes Set Within The Wider Landscape Framework.**

The size of coverage area will help in predicting the feasibility of the intervention. In broader terms, the landscape might translate to an area with connectivity service it delivers such as forests, ecosystem, a species corridor, watershed, or agricultural commodity. Without proper delineation, the coverage area will be massive. With a similar approach, a sub-landscape is able to focus on activities aimed to solve the most pressing issue in a targeted area that has strong sense of connectivity within its elements. The size of sub-landscape should be small enough to be manageable and encourage efficient engagement and synergies among activities (increasing spatial uncertainty and resource values that underpin sustainable livelihoods), large enough to have replicability value. For example establishment of village clusters (*Kawasan perdesaan*) of five to ten villages that are strongly connected upon the same dependency of the environmental service from a watershed within the same district.

#### **5. Ensuring Landscape Impact Verification & Accountability**

This point aims to streamlines the process towards a land-use data improvement for better justification, monitoring, and verification, to support decision-making at the top level, that relate to land use, and implementation at the ground level. One major remaining issue in the tropics is conflict on land use due to forest allocation in the forests frontier (Barbier and Burgess 1997), tenure insecurity (Larson et al. 2013), and weak governance (Lambin et al. 2014), which also experienced in Indonesia (Ministry of Forestry 2008).



Connectivity between government planning and the proposed intervention might contribute to a transparent land use verification and accountability. There are publicly accessible data and indicators that track outcome-based processes and impacts, especially for license holders and license givers, such as fire hotspots and scars, a road where it shouldn't be, making counterfactual (spatial) and baseline (temporal) comparisons. The improvement towards existing data on land use that reflected the reality on the ground should be worthwhile as part of intervention outcome. The challenge, however, those data and indicators might use a different method and not acknowledged by the government at the targeted landscape.

The implementation of this process to be conducted at the smaller scale, such as at the frontier village. The community has to be encouraged to aware on a village spatial planning process as part of land use optimization. It continues to engaging private, community and government representative to redefine the conflicted land use management. This latter process will be the starting effort to improve the official land use data.

### **Implementation at the sub-landscape**

These five principles adapted into three tiers on the process of implementation and conducted in parallel at the sub-landscape level. The project is specifically targeted to improve land use management and biodiversity protection at the frontier. Thus interventions implemented by direct engagement with the community at villages and local government (district level). The village is selected based on location proximity and similar issue or potential such as fire issue, and watershed protection.

In many areas in Indonesia, the village at the frontier are usually slow in development. The subsistence culture of the community mainly focused on their current needs and lack of future planning. In the same time, they have difficulties in accessing supervision for good agriculture practice, and guidance to improve the development due to the remote location.

On the environmental side, the dynamics of the frontier community have a different culture, beliefs and geographical location play a crucial role as a safeguard or vice versa (Colfer et al. 1996). Community perception to protect the forest as part of spiritual connection still exist, also to conserve forest due to their dependencies on daily necessities such as NTFP. In other side, communities also very reactive regarding livelihood and income improvement by clearing existing forest land for agriculture production. Due to limited knowledge on agriculture technology, they practice poor land-use management such as slash and burn (Padoch et al., 1998). Moreover,



forest clearing is also part of a tool for the land claim in the forested area (Fox et al., 2009; Angelsen, 1995). The dynamic of community perception might occur in one sub-landscape, which lead to land-use conflict with other stakeholders.

### **Tier one - engagement at the village level**

In Indonesia, every village is obligated to develop a six years development planning (RPJMDES) document. Therefore in study sites, village RPJMDES is the entry point of intervention, to assist the village on designing future plan to be acknowledged by district and sub-district government. The RPJMDES document required a clear elaboration the challenges they are facing, the needs, and priority of the plans every year, including spatial planning, mapping of village potential and asset.

Referring on each issues at each landscapes: fire management in Central Kalimantan and Watershed protection in Aceh, development program on the RPJMDES should be linked to forest monitoring, fire precautionary, enhance agriculture commodity that will support forest conservation, watershed protection or disaster preparedness activities.

Therefore, to develop the sub-landscape approach, we conduct activity at village level as an entry point. In the regulatory context, the government of Indonesia is encouraging the village development planning should include spatial planning process, as mentioned in several regulations as summarized in table 1 below.

In regard to land-use management improvement as priority focus, village community at the frontier area have a fair share in the future forest protection and conservation. There is increasing needs for further land-use control at rural community level, to redefine and to review the existing forests zones established by state for forest governance by KPH and BKSDAE<sup>1</sup>. As an example, in our sub-landscape, we introduce the zoning as part of the land-use planning process at the village level. Land use zoning is a process towards land use planning that will enhance development, optimize land productivity while protecting and conserving the nature in a bigger landscape if conducted in a right manner. Based on FAO, the purpose of zoning is “to separate areas with similar sets of potentials and constraints for development.” In contrary to forest man-

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<sup>1</sup> KPH divided the working area to several permanent blocking for protection, forest utilization, rehabilitation, and other purposes (Ministry of Forestry on KPH, 2011 p.57). This blocking area were determined based on the biophysical characteristic, social economy of local community, potential of natural resources, and the existing license on forest function and forest land use (Ministry of Forestry Regulation PP 6 2010).



agement by two agencies above, a village in particular frontier villages are not familiar with zoning. This land utilization and established zoning constraints agreement will slow down the negative impact on watershed quality and support towards a balance on surrounding nature environment (Lee 2009).

Land use zoning at the rural frontier, however, is not a common practice. Community in this area tends to utilize area reactively for sufficiency at the present. It caused the limited land vastly scarce, therefore engaging community in the process is essential. There are different approaches on land use zoning has been introduced. In most recent, Bourgoin et al (2012) implementing the zoning negotiation for participatory land use planning in Laos to encourage sustainable resource management by local communities as part of the REDD+ implementation. Both of those projects were done with a combination of GIS element on mapping and forum discussion groups to identify land use and analysis prior zoning. In upper Konto catchment in Indonesia, zoning policy at the village was made to support farmers on land intensification. Based on land sparing and land sharing theory, a model called FALLOW developed to help captured the differences of proposed land zoning based on scenarios made by the community reflecting the biophysical, labor and economic outcomes (Lusiana et al. 2012)

In Aceh, all of the pilot villages located upstream of the watershed and adjacent to forests area. Flooding is the main concern, after illegal logging and increasing interest on small holder oil palm cultivation. The zoning is an attempt to control land utilization around watershed and forest area. Thus, the development programs proposed in the RPJMDes is aligned such as enhancing agriculture productivity by a specific type of commodity that will support economic income and forest conservation. Whilst in Central Kalimantan, the villages located in peatland and experienced forest fires annually. Zoning is the key to intensifying existing cultivation such as rubber (*Hevea brasiliensis*), jelutong (*Dyera costulata*), galam (*Melaleuca leucadendron*), and fish ponds in productive land and to conserve the canal area around the village to be able for rewetting. In regards to the land use planning connectivity towards the village, development is, the proposed program includes community capacity enhancement in fire, land, and water management around the peatland.

On developing RPJMDES program, we emphasize the connectivity between a proposed program and improved land-use management through participatory mapping on village spatial



planning. Participative spatial planning and village development plan will capture local-context information and to reach direct support from the community (Valencia-Sandoval 2010).

In the process, we adjust with the existing guideline of RPJMDES guidelines by Ministry of Home Affairs Regulation 114/2014 on village development, emphasizing community participatory in information gathering, program development plans, and village spatial planning. The community is encouraged to elaborate the mapping activity by prioritizing the land use optimization based on needs, weighing the values on economic, environmental returns, and identify the challenges they are facing.

We work closely with the RPJMDES team member; representatives of village government and the youth. Before the community, this team is the key to reaching out the community to collaborate in the spatial planning and zoning process. In some community, it will be beneficial when we understand cultural history, where they may practice zoning as part of a traditional customary law. On the customary practice, there are sacred area that is prohibited for any activity, and hunting-gathering area which is prohibited for land clearing. This information will be useful to set the common understanding to the team and get their support. This team is the first to have to understand the importance of land-use optimization and to ensure village engagement in conservation and protection effort as part of the development program. This team is also the first to be trained on basic mapping activities such as GPS training, to acknowledge land use identification in the village. Mapping skill is one of the challenges in village spatial planning process. Although it is a requirement in the previous RPJMDES, villages in both landscape only prepared a sketch map of village containing the key landmarks such as public facilities and infrastructures.

Conducting a group meeting is the next process where we divide participants into several groups representing women, elderly, youth, and farmers. The meeting aimed for participants to visualize the connection of livelihood, village development plans and sustainability of environment (i.e. water quality of the river, forests, and land quality). Each group to create a sketch map identifying land-use in the village (customary forest, the sacred area, NTFP, species habitat, agriculture), historical hazardous area, village landmark, a location of livelihood activity, carrying capacity of the area with the local language. Based on the map, each group analyzes the condition of each land use, such as any disaster occurred in particular area, what is the key element of the area (such as a river, peak, mangrove, peatland), the potential, and how it affecting their lives.



Ground checking is conducted after the meeting, to ensure community visualization is representing the reality on the ground. During this activity, we ask volunteers from the team that was trained to use GPS to create a new base map by marking important places (river, settlement, public infrastructure). This important place is named based on local language. Our technical expert continues the process of transferring the GPS data and overlay with satellite imagery for further digitation using GIS software, ArcGIS. The end product is a map in 1:5000 scale presented to the community for a better visualization in the process of village spatial planning, including land use rationalization for a permanent zoning. However, we should note that in many frontier villages, there will be a constraint on a technical matter such as electricity, time limitation, and human capacity. A ground check and creating base map could also be done manually. With the same data collection on the key landmark, the team sketches a map on A1 paper, naming the landmark and differentiate each land use using colors and code. The new base map to be covered by an A1 size plastic for discussion with the community.

Based on priority area that was set by the community at the previous meeting, group representatives should be encouraged to speak up about the pro-and-cons of a proposed zone that might impact their interests. Table of priority is made to capture the flow of discussion. Furthermore, to combine the existing land-use and village development plan, the 1:5000 scale of satellite imagery will support to visualize the potential and possible challenges with different scenarios.

Further discussion arranged with participation from the community, KPH and government representative from sub-district and district. It is a phase where the community has the opportunity to rationalize the existing and future land use with the block of KPH, zones of the national park, or the buffer area of other land use managed by private (i.e., oil palm, rubber). On the village zone categorization, we refer to the main zones of KPH<sup>2</sup> and the national park<sup>3</sup>, divided into protected, cultivation, rehabilitation, and other zone such as traditional (sacred area). On each zone, the community develops regulations such as a restriction, and the requirement for land utilization or land clearing. For example in the protection zone, activity is limited for NTFP collection and restricted for any agricultural cultivation.

### **Tier two – redefine and rationalize zoning**

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<sup>2</sup> Government of Indonesia regulation 6/2007 on Forest governance and forest management plan, and the utilization of forests

<sup>3</sup> Ministry of Forestry Regulation P.56/Menhut-II/2006 on guidelines for the National Park zoning



The step aims for recognition of existing or planned zones of the KPH, villages, and the national park. At the studied landscapes, the KPH which is the closest institution on forest management at sub-landscape level is mostly in the early establishment. On the operation side, these KPH's is in the process of developing the working plan (RPHJP), including allocation for blocking. On the intervention side, the delineation of KPH working area is different, wherein Aceh is watershed-based that may consist three to five districts and Central Kalimantan based on an administrative boundary. Linked to the first tier, village level zoning is promising to add input for blocking based on direct community engagement.

Operationalizing a newly established KPH faced some challenges. Blocking allocation is part of the concern. Working cross district, there will be different issues that need to be solved, in particular at community level due to culture, dependency on forests products and tenurial at forests area. In Aceh and Central Kalimantan, one similar issue is an unclear boundary between a restricted area on forest and community cultivation area. Many community's agroforests found in a production block of KPH or the area of NTFP is in the protected forests.

At the sub landscape level, we facilitated the KPH to acknowledge this land use dynamic of the adjacent stakeholders. Bridging the collaboration between KPH, national park representative, community and private sector within the working area were conducted in many forms, such as engaging in the village RPJMDES and RPHJP development. In return, the zoning established by communities nearby the KPH will contribute as background material to redefine the existing forests land-use allocation and rationalize the blocks on the RPHJP. It will also contribute in sharing spatial information to improve the management in particular on natural resources utilization licensing. The long-term potential benefit is to open the possibilities of management collaboration between KPH and impacted communities such as on community forestry (HKm) scheme, stronger support on community NTFP marketing, and other economic-based collaboration.

### **Tier three - Jurisdictional approach**

Synchronize the intervention at sub-landscape with district government planning instrument will support the sustainability of a program. As explained above, the government developed a long-term plan such as district spatial planning and strategic environmental assessment to enhance the potential of a region in every sector including on environment protection and conservation. Studying the existing plan prior intervention is needed to identify the government direction and priority especially on environmental governance. Then, identify the conservation area at the tar-



geted sub-landscape referring to the plan as strategic area (KSK). KSK is a designated area that is considered valuable for the national, province, or the district in a specific matter; nature, economy, and security defense such as the national park, watershed, and potential commodity area. the designated area is signed by the head of district (Bupati) in a formal decree.

In Aceh sub-landscape, we identify the key watershed that connects to the national park of Gunung Leuser, KPH area and to the urban area. Focusing on the protection of watershed, it also directly affected by the improvement of land-use governance at the village and the forests. On the spatial planning, the government acknowledges the importance of watershed protection to support economic activities such as agriculture and to minimize flood potential. Based on this acknowledgment, the valuable watershed has the potential to be formalized by appointed as the strategic area (KSK).

We work closely with spatial planning board (BKPRD). BKPRD are the team on the long-term spatial planning development. We facilitate discussions to raise awareness on the importance of securing one of the biggest watershed (DAS) and villages around it for a sustainable development planning. As the attention for watershed protection is increasing, BKPRD proposed DAS Susoh includes the villages nearby as a district KSK. There are approximately 56 villages adjacent and highly dependent on DAS Susoh. After six months of discussions, DAS Susoh as KSK were signed by the Bupati. By law, the government and communities are responsible for safeguarding the watershed and minimize the impact from activities from upstream to downstream.

Following the work with BKPRD, we also support the detailed spatial planning in the urban area (RDTR). RDTR is a district government long term plan specifically for urban area development. On the work for the RDTR, the government was assisted on the technical side, providing satellite imagery and capacity enhancement on urban planning analysis. The end result of RDTR is the zoning ordinance for urban development legalized by Bupati Regulation. Through RDTR process focusing on the downstream of DAS Susoh at urban area, and KSK for the upstream, the government will have the platform to interconnect rural and urban development focusing on securing the watershed of DAS Susoh.

The level of effort to synchronize an environmental program with government plan is more advanced than other steps we discuss above. This process required an intense advocacy at the higher executives and in particular, the BKPRD consisting some of the key agencies; Public Works (PU), District planning and development agency (Bappeda), Forestry Service (Dishut),



agriculture agencies, environment agencies (Bapedalda, BKSDA). It is also required for bigger public consultation inviting multi-stakeholder for the designated area, in particular to socialize the zoning ordinance.

### **Challenges**

At the sub-landscape, KPH is not fully operationalized and most of the KPH does not have final RPHJP. It becomes a challenge because the community does not have a starting point to discuss their proposed land-use zoning. In particular for cultivation area that located in protected forest area.

Collaboration between stakeholders also challenging process at the village level. Community lives at frontier area have a low confidence to be involved and contribute to the land-use discussion due to their insecurity on their land tenure. They have the weakest regulation support in terms of land utilization, ownership, and governance. Inviting the community to be involved in RPJMDES focus group needs intensive and repeated effort. Moreover, to keep the participants to stay interested also need to be strategic, because each meeting takes more than 3 hours. In technical side, prior intervention, spatial planning is practiced very limitedly, especially zoning. Although required in RPJMDES, the maps that were produced are mostly a sketch without connectivity with development and land use planning. Explaining real examples of the purpose and result of spatial planning for village development and support to well-being improvement might inspire the participants and willing to be engaged.

### **Conclusion**

Looking at many cases, we agree that landscape approach is promising but also have uncertainty to future continuity, especially in a bigger landscape coverage area. Nevertheless, in addressing the different context at each landscape, the sub-landscape approach in a smaller area was seen to be more effective and on-target. It will ease the coordination at village communities, government, and the private sector as the canal that leads to social cohesion on forest and land governance.

Although, without denying the reality, the existing problem of sectoral interests might appear. Frontier areas in tropical countries have faced most complex issues on land-use governance. In study sites, frontier villages also remain to have the most insecure land ownership due to the existing land-use allocation; for industrial concessions, protected forests, conservation forest,



and production forests. Contradict to private sectors, which operates with a valid license which consequently responsible for obeying land management based on government regulation and also due to market pressure such as certification standard (i.e. RSPO, FSC). Thus, land competition is significantly increasing for villagers to intensive agriculture plots (i.e. irrigated rice fields, permanent mixed tree-based crops), and between the private sectors. In result, further forest clearing will accelerate, and for the key areas such as forests and peatland, will affecting the entire ecosystem services.

In the implementation of sub-landscape approach, each tier is connecting but conducted in independently. In the first tier, injecting the spatial planning process with zoning approach in the RPJMDES will stimulate the process towards an improvement on land use management, particularly on the frontiers. The village might consider and encourage to replicate the process, based on existing examples. In the implementation, however, it is clear that most of the villagers are lacking with spatial planning skill. Thus it is worth to consider that investing on villager's capacity enhancement will help the district government in the long term especially for the village development improvement. The second tier encourages the collaboration between land managers on land utilization. It is aimed to rationalize and optimize the land-use management, based on zones. This process may open to an improved land use management at the forest area in the long term by acknowledging it in the KPH's plan. The third is the most advanced process among all but strategically potential for higher acknowledgment and program continuation. Formally recognized KSK by identifying villages and areas for conservation and protection gives a better possibility for stronger support such as funding, experts for capacity building from the private, and government at district to the national level in the future. And also, harmonizing detailed spatial planning in a fine-scale map of 1:5000 (RDTR and participatory village map) between urban, rural and strategic area will accommodate to refining the definitions of land use zones in state forest areas and adjacent private land by a zoning ordinance.

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**Table 1 Regulation indicating the importance of village spatial planning**

<b>Regulation</b>	<b>Key information</b>
Government of Indonesia Law 6/2014 <sup>a</sup>	To have a map of village boundary defined by the head of district
Ministry of home affairs 114/2014 <sup>b</sup>	To map village potential and spatial planning referring to the district spatial planning
Ministry of Village and transmigration 21/2015 <sup>c</sup>	To map village potential and village asset

<sup>a</sup> Government of Indonesia (2014), <sup>b</sup> Ministry of Home Affairs (2014), <sup>c</sup> Ministry of village, development of disadvantage areas and transmigration (2015)

Figure 1 Map of study sites.

Leuser Landscape in Aceh province on the left side and Katingan-Kahayan Landscape in Central Kalimantan on the right.  
3300 × 2550

