The Samdhana Institute
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Drivers of Forest Transition in West Papua Province: A Village Level Analysis

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Tanah Papua forests amount to a total area of 42,224,840 hectares (ha), which is equivalent to 95% of its total land area,[1] and another 1,678,480 ha consist of water bodies.[2] The forests were split across two administrative jursidictions in 2004, between the provinces of Papua and West Papua. Forest areas in Papua Province amount to 30,387,499 ha[3] and forest areas in West Papua total 9,361,076 ha.[4]

Data from the GIS Laboratory of the Faculty of Forestry at Universitas Papua (UNIPA) (2019) states that until 2018, West Papua's deforestation totalled 152,373 ha, while forest degradation amounted to 2,088,278 ha. The factors driving deforestation and forest degradation require further examination, in order to develop alternative mitigation approaches. At the same times, data also shows that in several West Papua districts, there are trends toward an increase in forest cover. This also suggests that there are opportunities for afforestation and reforestation. This process of forest loss and forest gain are known collectively as forest transitions,[5] a phenomenon that describe the dynamic patterns of forest cover changes. In this paper, we also consider forest transition as directly linked to the social capital of indigenous peoples.

The purpose of this study is to analyze the drivers of forest transition, providing explanations at sites experiencing both forest degradation and reforestation, as well as examining policies related to changes in land and forest cover. The UNIPA Faculty of Forestry and Samdhana team conducted research in March-August 2020 to determine patterns of forest transition and deepen our understanding of factors that either trigger or prevent forest transitions. Four villages located among West Papua's forests were selected as case studies, spread across three regencies: Fakfak, Tambrauw, and South Sorong.

1. Decree of the Minister of Forestry and Plantation No. 891 / Kpts-II / 1999 on the Designation of Forest and Waters Area of Papua Province
2. Forestry Agency of Papua Province, 2004
3. SK.782 / Menhut-II / 2012
4. Minister of Forestry Decree No. 783/2014
5. Kauppi et al., 2006

The figures and tables below show the forest transition patterns in the four study areas. Figure 1 presents the overall typology of forest transition at the four villages, whereby each village was placed in the corresponding quadrant according to the forest transitions taking place there. The remaining figures and tables describe the land cover dynamics specific to each village.

Figure 1. Typology of forest transition in the 4 study areas.

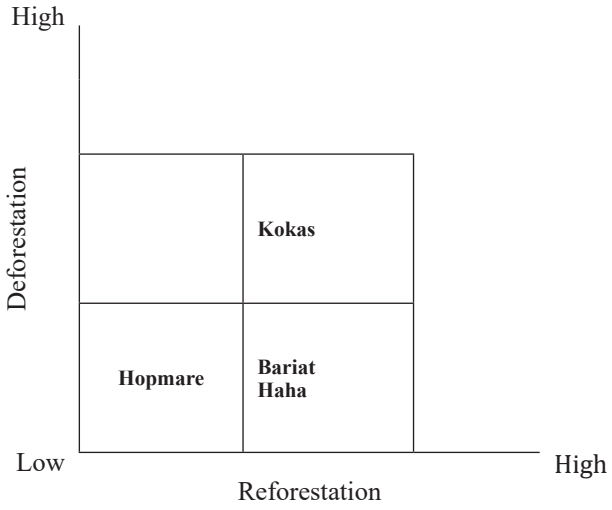

Table 1. Land cover change in Hopmare Village, Tambraw Regency

Year	Forest (ha)	ha/yr	%/yr
1990	7,268.56		
2000	6,778.05	- 49.05	0.008
2010	6,841.57	6.35	- 0.001
2018	6,543.16	- 37.30	0.005

Figure 2. Land cover change in Hopmare Village, Tambraw Regency

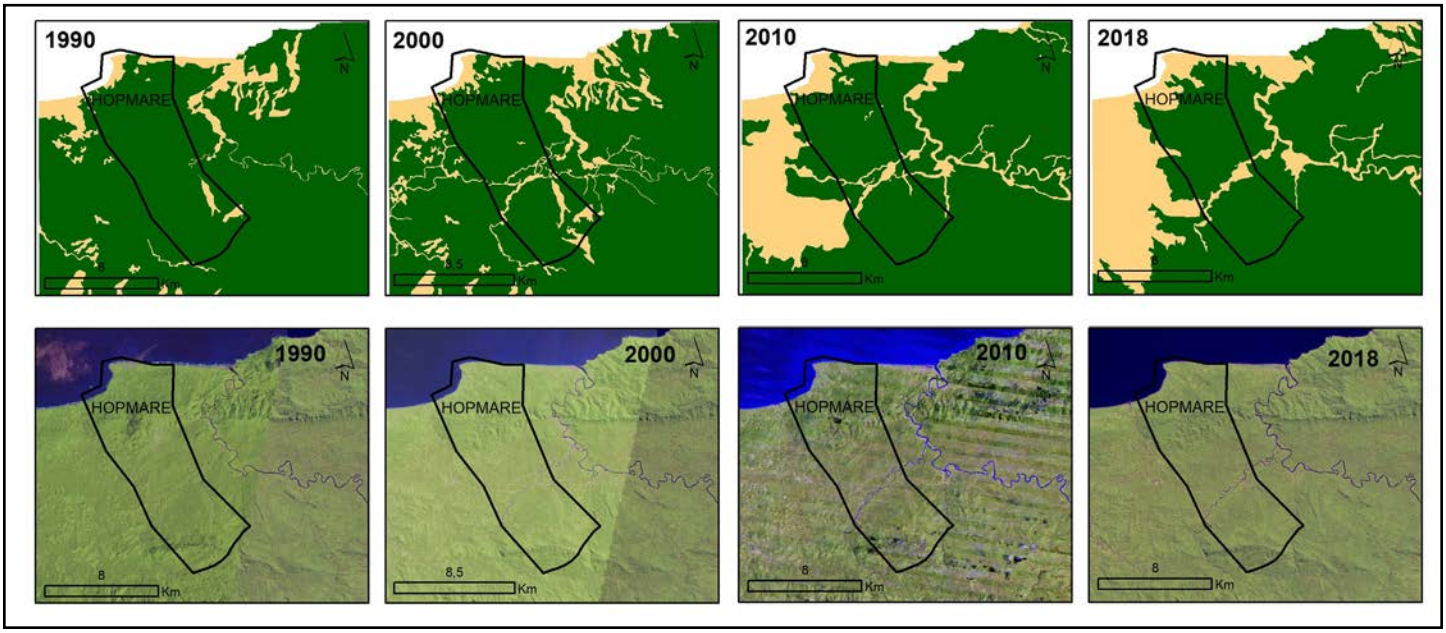

Table 2. Land cover change in Haha Village, South Sorong Regency

Year	Forest (ha)	ha/yr	%/yr
1990	1,171.31		
2000	1,171.31	-	-
2010	1,171.31	-	-
2018	1,171.31	-	-

Figure 3. Land cover change in Haha Village, South Sorong Regency

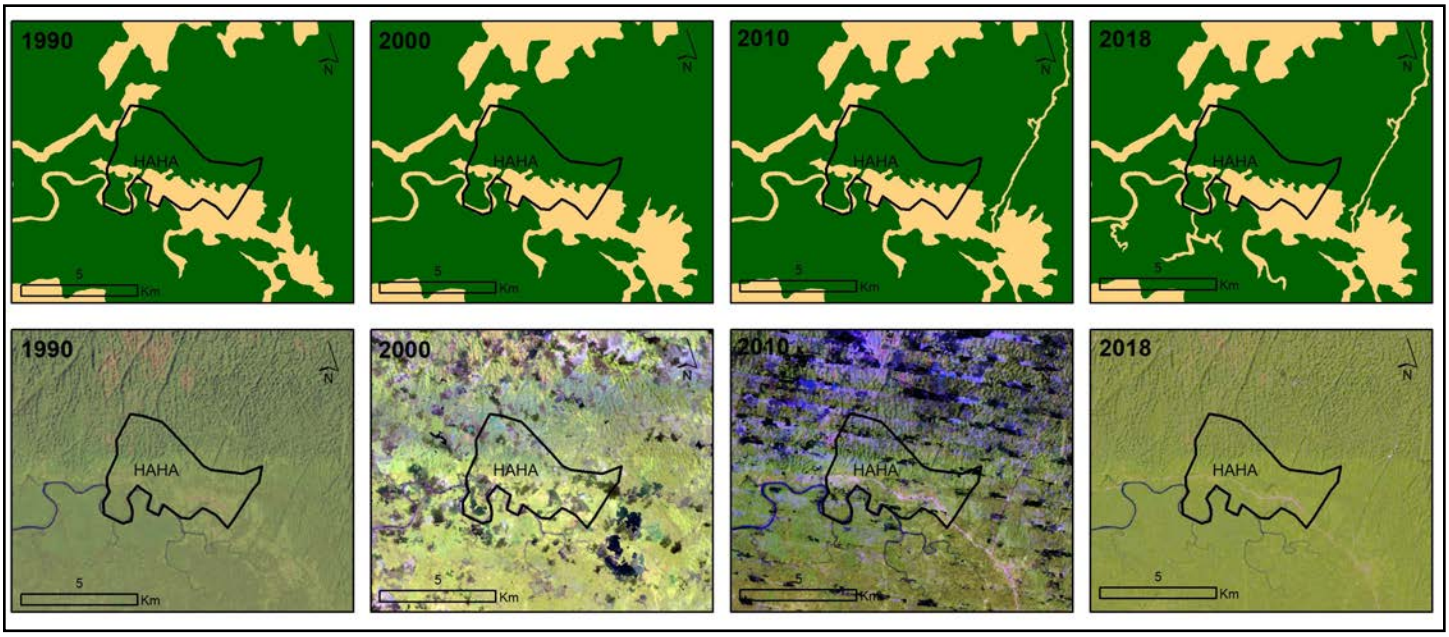

Table 3. Land cover change in Bariat Village, South Sorong Regency

Year	Forest(ha)	ha/yr	%/yr
1990	3.169,40		
2000	2.699,98	- 46,94	0,015
2010	3.063,94	36,40	- 0,013
2018	3.063,94	-	-

Figure 4. Land cover change in Bariat Village, South Sorong Regency

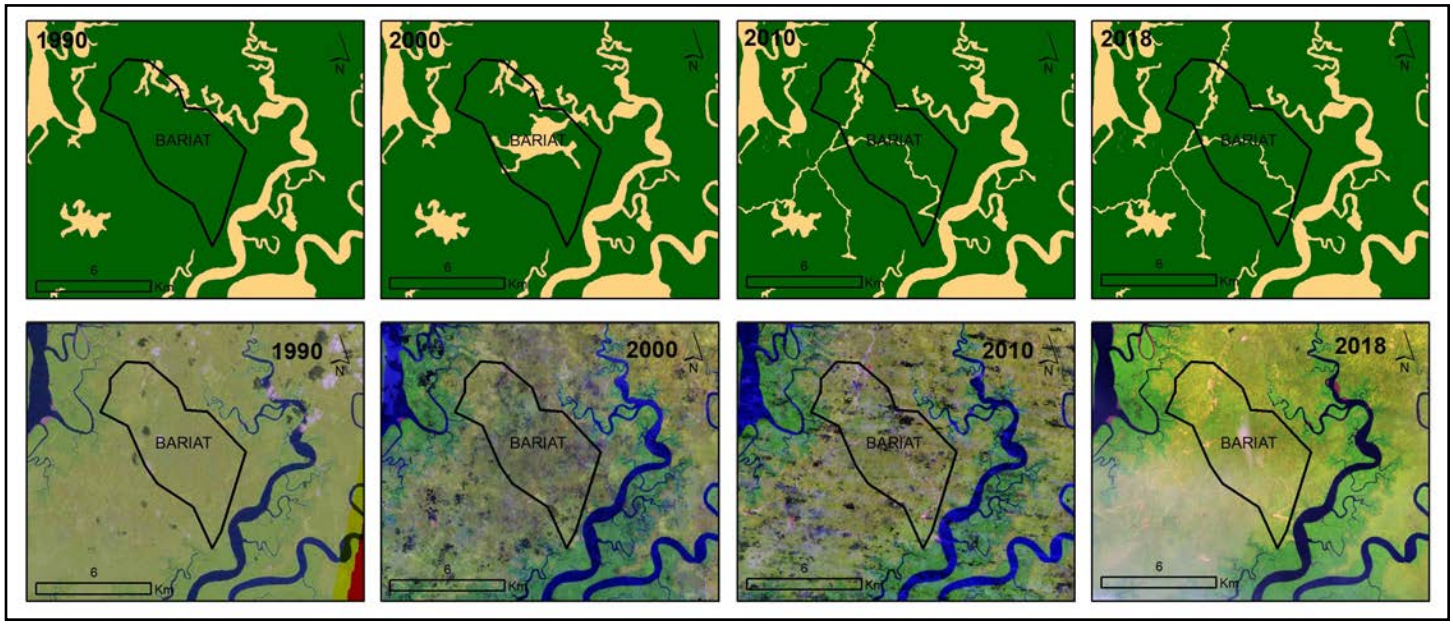

Table 4. Land cover change in Kokas, Fakfak Regency

Year	Forest(ha)	ha/yr	%yr
1990	10.098,32		
2000	9.996,79	- 10,15	0,001
2010	9.656,58	- 34,02	0,003
2018	8.919,77	- 92,10	0,010

Figure 5. Land cover change in Kokas, Fakfak Regency

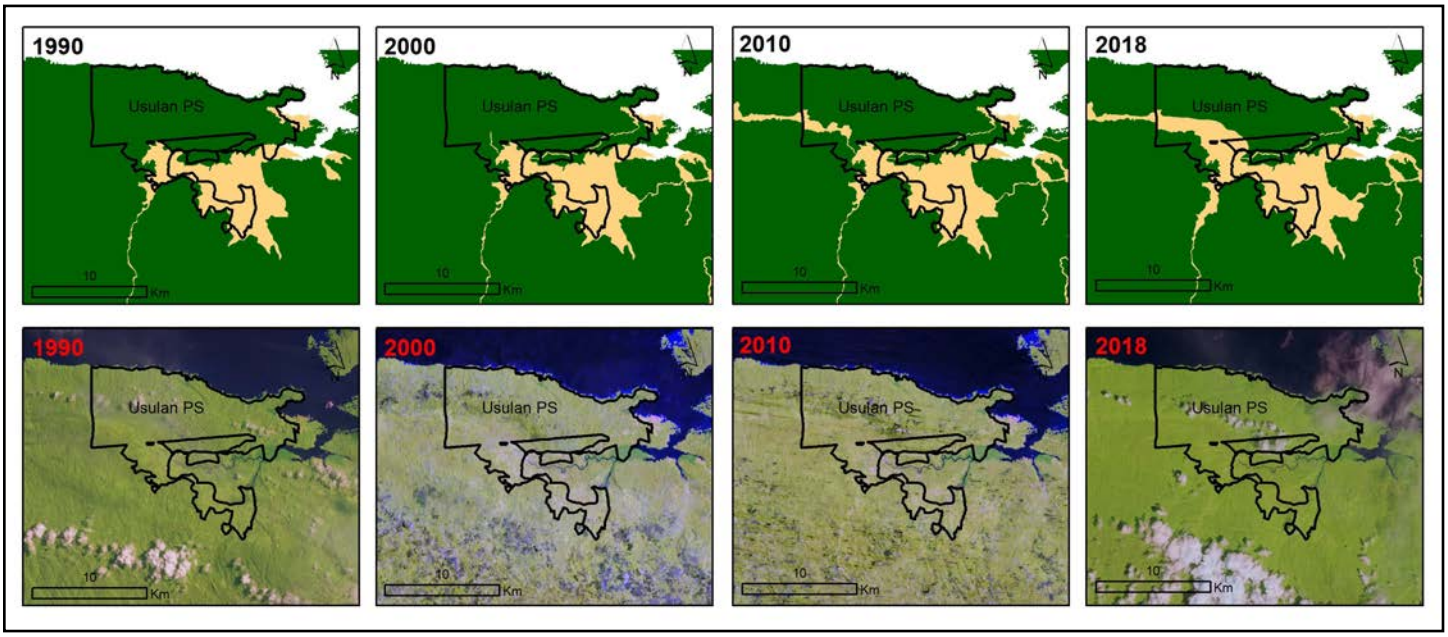

Table 5. Non-forest land cover in 4 study areas

Non forest land cover	Hopmare		Haha		Bariat		Kokas	
	Ha	%	Ha	%	Ha	%	Ha	%
Water body	3	1.5	22	43.1	1,235	95.4	7	2.7
Built land	13	6.4	17	33.3	20	1,5	74	28.7
Open land	19	9.4	4	7.8	28	2.2	8	3.1
Garden	27	13.3	2	3.9	-	-	-	-
Grass land	-	-	-	-	11	0.9	2	0.8
Bush	141	69.5	6	11.8			167	64.7
Total	203	100	51	100	1,294	100	258	100

Beyond these summary statistics of land cover and land use changes, the study team also explored the underlying causes of forest transitions in each village. The results of the study indicate that the drivers of deforestation in the four study areas are as follows:

- Opening of swidden gardens/fields. Shifting cultivation has become one of the drivers of both forest degradation and deforestation. Although this factor is generally less intensive, given the role that communities swidden also has in supporting forest health, the results of this study show that expansion of shifting cultivation in more intensive ways in the three of the four study locations has served as a factor in driving deforestation. The forms of deforestation associated with emergent shifting cultivation processes are evident through community activities clearing forest land for planting various types of crops. These activities are carried out in a rotational pattern, suggesting the higher likelihood of reforestation compared to other land clearing activities.

- Village expansion. One of the negative impacts from the central government's development policy to increase village fund allocations has resulted in forest degradation and deforestation. In order to obtain the allocation of funds, each village must first meet administrative requirements, which has served as an initial driver for clearing land to make the case for establishing a new village. One of the key requirements for establishing a new village is its location. The potential allocation of fund disbursements has triggered the increased proposition of forming new villages. Forest land has been cleared to fulfil administrative requirements to establish a new village.

- Road infrastructure development. This study found that alongside the establishment of village jurisdictions, also comes with new infrastructure development. New construction of roads, bridges, housing, and other facilities in support of village development has led to deforestation and forest degradation. The need for land and building materials has driven localized deforestation in the use of timber for development and quarries for construction. Forest land areas provide the main resource for this development.

Meanwhile, the study also identified several key factors that assisted in curbing deforestation in the four study areas, as follows:

- The absence and operation of large-scale company concessions. In three of the four villages the study found that until now there are still valid permits for large-scale timber exploitation, but that operations in the field have not been carried out. This is especially true for the study location in Hopmare village, which is a logged over area of PT Multiwahana Wijaya logging concession. This study

provided initial evidence that there are no significant company activities that have impacted deforestation or forest degradation, both in terms of land clearing activities for the construction of company facilities or for production activities for logging.

- Land tenure clarity. Clarity of land tenure encourages improved relations between communities both internally and externally, and also benefits the protection of forest land. One of the obstacles to deforestation is the clarity of land rights at the study locations. This has prevented and minimized land use conflicts since land occupation and land grabbing practices did not occur at these sites. Each marga/clan is able to visualize their customary territory and has tried to maintain the existence of the forest in areas under their control. This study views that the clarity of land tenure can prevent deforestation and forest degradation in the study locations.

- Agricultural systems that support forest conservation. The agricultural system in the study areas practice traditional planting and cultivation systems. These systems only encourage people to open gardens to plant modest crops to meet their daily subsistence needs. In these locations, locally-rooted systems have encouraged communities to clear land for gardens in ways that maintain certain tree species for soil conservation that foster forest health. Communities have also integrated cultivation practices to introduce several types of tree crops for economic benefits, which are also considered beneficial for reforestation efforts. These inclue, for example, Durian (Durio zibethinus), Langsat (Lansium domesticum), Rambutan (Nephelium lapaceum).

- Management and utilization of Village Funds. The government policy of allocating village funds has also had a positive impact on protecting forests. Although above, study findings noted that fund allocations for village proliferation were responsible for driving deforestation, this study also shows

potential benefits to conservation. Early indications from village fund allocations also show that they are being used for more sedentary settlement practices, which also lead to agricultural practices that reduce pressure on forests. By spending more time building and improving homes into more permanent settlement areas, as well as developing the key village infrastructure that support communities, the overall footprint on forest clearing is also reduced.

Policy Implications

There is a need for government policy interventions at the regency and provincial levels to support the mitigation of deforestation and to work towards adaptation in areas that are already at risk. Mitigation strategies can be carried out through a rigorous selection process for proposals to form new villages that

also pay close attention to the potential deforestation impacts in establishing such villages. The sustainability dimensions and overall environmental impacts are very important criteria to consider, and indicators can be developed for the formation of new administrative villages. On the other hand, policies should be formulated in ways that encourage adaptation in the form of meeting key obligations for each village, working to carry out reforestation programs as a requirement of local government permitting as part of the formation of new villages.

The study found that reforestation occurred in three of the four study locations. In Bariat village, reforestation was marked by the absence of tree felling of the agatis resin trees by the community. In Haha Village, the existence and continued maintenance of ‘sago hamlets’ were key, as the community continued to cultivate and replace sago trees. In Kokas village, reforestation is carried out through planting of nutmeg trees by the community both on family-owned lands and on state forest lands. The nutmeg agroforests are the main source of income for almost all communities in Kokas.

On the other hand, reforestation will only be successful if the government is able to develop a strategy in synergy with the existing sociocultural systems in these communities. The sociocultural systems referred to here is in the form of existing local wisdom and local values. Planting and maintaining key tree species along river banks, or careful selection of forest harvesting that does not carelessly cut down important species for forest health, as well as other factors, such as those related to sacred forms of protection in ways that are connected to local symbols and dimensions of community identity, are some of the key principles that need to be central to any initiative supporting forest conservation. Local values need to continue to serve as a fundamental strength of curbing deforestation and forest degradation. Local values and local wisdom need to be protected and reinforced as forms of social capital that will continue to support reforestation and other environmental conservation efforts for the long term. Normative conservation in synergy with social capital is the collective formula for sustainability in future natural resources management. This study suggests that social capital of local communities at the study locations and elsewhere serves as a core strength of preventing deforestation.

The data from this study still needs to be further field tested to ensure the validity of the interview data, ground truth the dynamics of land use change, and verify with overall policy trajectories. A deeper understanding of these forest transition dynamics are important for promoting policies on the protection of forest resources and preventing further forest, at risk from ongoing development policy factors.