Relationship of the land status with forest and land fire disaster: case study in the Central Kalimantan Province

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Abstract. The occurrence of Forest and Land Fire (FLF) disasters in the last decade is an important issue for Indonesia because it is widespread in various provinces, especially in several provinces on the island of Sumatra and of Kalimantan. The FLF caused massive haze spread over most of the eastern Sumatra and of central-western Kalimantan, even also widespread over Singapore and southern Malaysia. The haze of the FLF has an impact on some aspects such as: in public health, social, economic and environmental. The tenure aspect needs to be considered in analysing the possibility of FLF to anticipate and prevent the FLF because of the clarity of land tenure status that commonly known as land rights, relate to the regulation that must be fulfilled. In connection with the above background this study focuses on the Relationship between Land Tenure Status and FLF occurrences: Case Study in Central Kalimantan Province. The results of the study are expected to be used as input in the preparation of the FLF prevention efforts. This study was conducted by analysing spatial data of hotspots and real fires, land-sat data, and data of actual fire occurrences that occurred in 2008-2018. The results of the factual analysis showed that the FLF occurrences in various land tenure status with a total fire area of 16.5% of the total land area of Central Kalimantan. Related to the status of land tenure, this study shows that fire incidents in forest region are 70.67% and in the non forest region are 29.33% of total fire area.

1. Introduction

The occurrence of Forest and Land Fire (FLF) Disasters in the last decade is an important issue for Indonesia because it is widespread in various provinces, especially in several provinces on the Sumatra and the Kalimantan islands. The FLF caused massive haze spread over most of the eastern Sumatra and of central-western Kalimantan. Not only in the Indonesian territory, haze is also widespread over Singapore and southern Malaysia. The haze of the FLF has an impact on some aspects such as: in environmental social, economic and some cases in public health. However the FLF was not only occurred in Indonesia, according to Neighbour [1] the five forest blazes caused by human hands which could have devastating effects for countries all across the world were Heilongjiang Fire (China, 1987), Wallow Fire (USA, 2011), Uttarakhand fires (India, 2016), Brandenburg Fire (Germany, 2018), and Saddleworth Moor Fire (UK, 2018).

The FLF increases the emission of CO₂ emissions [2], SO₂ [3]and air pollution [4-6], ultimately causes environmental degradation. According to [7]. The environmental degradation influences socio-economic development, whereas the socio-economic development, as indicated by relationship between gini-ratio and per capita income, follows an inverted U-curve shape along environmental
degradation. Furthermore it is not only the FLF, in long-term an economic development also increases global warming and the greenhouse effect [8, 9].

Lesson learned of forest disaster from all over the world, the FLF most probably related to human activities. It means that the FLF occurrences are related to the tenure aspects of land forests. Therefore the tenure aspect needs to be considered in analyzing the possibility of FLF. This is important to anticipate and prevent the FLF, because of the clarity of land tenure status, that commonly known as land rights, relate to the regulation that must be fulfilled (restriction), and clarity of responsibilities that must be fulfilled by holders of land rights (responsibility). In Land Administration it is known as 3Rs. In connection with the above background this study focuses on the Relationship between Land Tenure Status and Forest and Land Fire Occurrences: Case Study in Central Kalimantan Province. The results of the study are expected to be used as input in the preparation of the FLF prevention efforts.

2. Materials and Methods

The study was conducted in central Kalimantan Province. Geographically, Central Kalimantan is located between latitude of 0°45’ N, 3°30’ S and longitude of 111°-116° E. (Figure 1). It has total area of 153.564 Km² consisting of 13 districts and 1 city. The Province of Central Kalimantan was selected as the research location because of a long history of forest and land fires experiences.

2.1. Materials

Socio-economic and biophysical data were collected. These data were consist of FLF factual data during recent decade, Land use and land cover map, forest area map, peat area map were obtained form Ministry of Environment and Forestry of Republic of Indonesia; Rupa Bumi Indonesia Map (RBI) from the Geospatial Information Agency; The Central Kalimantan Province Spatial Pattern map and the HGU distribution map are from the Ministry of ATR/BPN; Population, economic and social data are from the Central Statistics Agency; and SRTM DEM, Images of LANDSAT 2007 - 2018 and of SPOT 6 from USGS for more accurate and detailed analysis. The tool used in this study was a computer, using ArcGIS software to perform spatial analysis. The process of presenting data and further analysis using Microsoft Excel and SPSS.
2.2. Methods

The development of the FLF Spatial Model focuses on the potential FLF that occurs spatially both factually and predictably. The construction of the FLF model goes through various stages including:

First Stage, namely by collecting data, then identifying the variables that are suspected to be the driving factors for the occurrence of FLF.

The Second Stage is standardizing the data, using the following equation:

\[
\text{Score Rout} = \left( \frac{\text{score Einput} - \text{score Emin}}{\text{score Emax} - \text{score Emin}} \right) \times (\text{score Rmax} - \text{score Rmin}) + \text{score Rmin},
\]

(1)

Whereas, Score Rout: value of output score standardization result, score Einput: value of input score, score Rmax: maximum value of standard score (255), score Rmin: value of minimum standard score (0).

The third stage is sampling through the spatial purposive random sample method using the ArcGis software. The determination of the minimum sample size is based on the Slovin Formula with the following equation:

\[
n = \frac{N}{1 + Ne^2},
\]

(2)

Whereas: n: number of minimum samples, N: population, e: margin error.

The fourth stage is to conduct a multi co-linearity test using the Variance Inflation Factor (VIF) with the following equation:
(VIF)_{i} = \frac{1}{1 - R_{i}^{2}} \tag{3}

Whereas $i^2$ : the coefficient of determination of the free variable regression to i. Value of $VIF > 10$ indicates the presence of multi co-linearity so elimination is carried out.

The fifth stage involves a twisted logistic regression analysis. In general the equation is as follows (Hosmer and Lemeshow 2000):

$$
\pi(x) = \frac{\exp(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n)}{1 + \exp(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n)} \tag{4}
$$

Whereas $\pi(x)$ : probability of the occurrence of land fires (0-1), $\beta_0$: constant, $\beta_1$, $\beta_2$, ..., $\beta_n$ : coefficient of variables $x$: $x_1, x_2, x_2, \ldots, x_n$: predictor variables.

The sixth stage is to test the acceptance of the model with a certain significant level (0.05). Acceptance of the model is expressed by $\chi^2$ (chi-square) with free degrees $p$ accepted if the value of $p > \alpha$ (significant level). The process of sorting variables can be done with the backward stepwise method by reducing variables that have no effect on the model. Model compatibility tests can be used[10].

The seventh stage is to validate the model by using overall accuracy, by comparing the predicted results and the actual data of the occurrence of land fires.

The eighth stage is to do a sensitivity test with the ROC (Relative Operating Characteristics) curve. ROC value has the understanding that if it is close to 1 it means the better ability to predict.

We use 2007 data to build a spatial model of land fire disaster that occurred in 2008-2018. The results of the model are used to predict the spatial FLF in 2019-2029 with the use of 2018 data.

3. Result & Discussion

The FLF spatial modelling requires conversion results in the form of raster across all variables. Thus the entire population is in the form of a pixel with a resolution of 30 x 30 meters with a value of influence 0 - 255. Values approaching 0 have a low influence on these variables, whereas approaching 255 has a high effect. Figure 2 is the results of the conversion of all variables into raster form.
Figure 2. Conversion of variables into raster form.

The total population is 161,918,710 pixels. Then the samples are taken by using purposive random sampling method. The principle of representativeness in sampling is done spatially from the population with an error margin of more than 2%. The sample used was 4,194 pixels assuming more than an error margin of 2%.

The results of multi co-linearity test from various variables obtained that the entire variable did not have any symptoms of co-linearity which was indicated by the VIF value <10. The logistic regression test obtained the following algorithm results:

\[
\text{logit} \ FLF \ \pi(x) = 7.185 - 0.149x_2 + 0.038x_3 + 0.060x_5 - 0.071x_6 - 0.087x_7 - 0.459x_8 - 0.076x_9 - 0.453x_{10} + 0.049x_{11} - 0.032x_{12} - 0.019x_{13} + 0.097x_{14} + 0.052x_{15} - 0.028x_{16} + 0.089x_{17} - 0.100x_{18} - 0.222x_{19}
\]
Of the twenty variables used, seventeen variables were suitable for the model. The logistic regression test above results have a significance level of > 0.05 using the Hosmer and Lemeshow test. Nagelkerke R2 value of 90%. These results indicate that the above model has the feasibility of being used as a FLF prediction model. Furthermore, the model sensitivity test produces a value of 98.9%, which is presented in Figure 3, and this model is categorized as the model has a high sensitivity.

![ROC Curve](image)

**Figure 3.** The value of the sensitivity of the model shown by the ROC Curve

The equation of the model algorithm above can be calculated probability values (range values 0-1) spatially from the whole population. The results of the spatial probability the FLF model in 2008 - 2018 were formed with the 2007 independent variable and the dependent variable was formed from the 2008 - 2018 data, which is presented in Figure 4. Furthermore, the spatial probability and predictions of FLF in 2019-2029 are obtained by utilizing the built-in model with the use of 2018 free variable data for the entire population. The spatial probability results are presented in Figure 5 as follow:

![FLF Probability Mapping in 2008-2018](image)

**Figure 4.** The FLF Probability Mapping in 2008-2018

![FLF Probability Mapping in 2019-2029](image)

**Figure 5.** The FLF Probability Mapping in 2019-2029

Based on the results of the probability map, the next FLF prediction model was built in 2008 - 2018 obtained by using a sensitivity level of 0.989 - 1 as a burned area and a sensitivity level <0.989 as an
unburned area. The map of the FLF prediction results is presented in Figure 6, then the map of prediction results in 2019 - 2029 is presented in Figure 7. The assessment results of the model accuracy are compared with factual data, resulting in an overall accuracy of 78%. From the series of tests above, the FLF model that has been formed has a good feasibility (robust) in explaining the factual occurrences of the FLF. Thus a statement can be drawn that the FLF occurrence was influenced by these variables which worked simultaneously.

**Figure 6.** The FLF Prediction Mapping year of 2008 – 2018

**Figure 7.** The FLF Prediction Mapping year of 2019 - 2029

The FLF handling which is currently carried out is more dominated by reactive actions, such as fire fighting and law enforcement. These have not yet touched the root of the problem, therefore the FLF became regular disasters. While preventive measures to address the FLF such as regulating and internalization of regulation related to land clearing, land conversion, excessive use of natural resources, and land conflicts due to unclear rights and restriction, have not been included in the FLF control policies. The existing regulations do not specifically regulate the FLF mitigation planning at both the macro and micro levels. Based on the 2011-2019 RKTN and its elaboration in the 2015-2019 RPJM the relation to FLF disaster management is not explained in a special clause on the direction of general policy and strategy [11]. Furthermore, in the attachment of the Central Kalimantan Provincial Regulation Number 5 of 2015 concerning the Spatial Planning of the Central Kalimantan Province in 2015 - 2035, it does not contain detailed and specific information on areas that have FLF vulnerability. The focus of handling or mitigation efforts undertaken by the object is still general to all districts / cities.

The FLF in 2015 in Central Kalimantan Province which caused various losses encourage the public to file a lawsuit against the government. This is based on Law No. 32 of 2009 concerning the protection and management of the environment that the community have right to have good and healthy environment as part of human rights [12]. Furthermore, through the Supreme Court Decision of the Republic of Indonesia Number 118 / Pdt.G / LH / 2016 / PN Plk, the government is sanctioned in the form of several obligations that must be fulfilled, one of which is to make a map of the vulnerability of forest, land and plantation fire disasters in the area of Central Kalimantan Province. The FLF vulnerability map is a mitigation effort that has an urgency towards areas that are vulnerable to FLF disasters, especially in Central Kalimantan Province.

Based on Law No. 24 of 2007, mitigation is a series of efforts to reduce disaster risk, both through physical development and awareness raising and capacity building to face the threat of disaster [13]. Preventive efforts through development planning that incorporate elements of disaster management policy are the authority of both central and regional governments. Good planning requires the support
of data and information that is specific, accurate and accountable. The FLF disaster management efforts require information on spatial location. More specific information about the spatial location of FLF disasters is explained by the FLF spatial model. The spatial model that has been developed has a degree of feasibility that is able to predict the incidence of FLF in 2019-2029 the results of the study obtained the probability map and FLF prediction map in 2019-2029 Figure 6 and Figure 7. The FLF Prediction Map of this model has a fairly good detailed information, so it can know the geographical location of the burned area. Social, economic, biophysical and right aspects are factors used in the development of typology and spatial models of FLF.

In the studied area, the factual data showed that FLF occurred in various land-use and land status (Table 1). This table indicated that the FLF both in the forest region and non forest region with various functional plan with total area included 2,528,163 Ha or about 16.5 % of the total area of Central Kalimantan Province. During 2008-2018 the FLF dominantly occur in forest region (70.67%), especially in production forest (29.53%) and convertible production forests (21.79%). Whereas in the non forest region occur in plantation (HGU) (12.90%) and other culture uses (9.83%). Various aspects contributed to the occurrence of FLF. Many studies on the factors causing FLF in various countries. General description of these factors has been revealed through the concept of the fire pole (Brown and Davis 1973), namely the availability of fuel, oxygen and the trigger factors in the form of fire that can be associated with human activity. The human activity factor, if supported by adequate accessibility, will become the dominant factor. This can be indicated by proximity to settlements [14], proximity to road infrastructure [15, 16], railroad tracks [17], intensity of land use, and land use change (Avila-Flores et al. 2010), and socio-economic transition [18, 19].

According to Nunes, Vasconcelos, Pereira, Dasgupta, Alldredge and Rego [20] fires can occur due to various factors, but the availability of fuel and weather conditions stimulates the spread of fires more quickly, thus exacerbating fires. The probability of FLF of the land with shrub cover is driven by the age of vegetation and the volume of organic matter accumulation [21].

Table 1. Summary of FLF Occurrences in 2008 - 2018

| Region Status | Spatial Pattern Plan | Function Plan | Ha  | Percent (%) | Land tenure status* |
|---------------|----------------------|---------------|-----|-------------|---------------------|
| Forest Region | Protection           | - Protected Forest | 266,717 | 10.55        | TN, HMHA            |
|               |                      | - Nature Reserve and Nature Conservation Areas | 177,560 | 7.02         |                      |
|               | Cultivation          | - Production Forests | 746,443 | 29.53        | IUPH, HPH, TN, HMHA |
|               |                      | - Convertable Production Forests | 550,768 | 21.79        |                      |
|               |                      | - Limited Production Forest | 45,128  | 1.78         |                      |
|               | Sub-total            |               | 1,786,616 | 70.67        |                      |
| Non Forest Region | Cultivation        | - Plantation | 326,123 | 12.90        | HGU                 |
|               |                      | - Other Culture Uses | 248,609 | 9.83         | HM, Right with Local Legalities |
|               |                      | - Agriculture | 28,091  | 1.11         |                      |
|               |                      | - Settlements | 137,973 | 5.47         |                      |
|               |                      | - Mining      | 751     | 0.02         | IUP                 |
|               |                      | - Sub-total   | 741,547 | 29.33        |                      |
| Total         |                      |               | 2,528,163 | 100.00       |                     |

*a TN : Tanah Negara (State Land)
bHMHA : Hak Ulayat Masyarakat Hukum Adat (Ulayat Land Right)
Furthermore, fuel stock in the form of shrubs is produced from the forest transition process. The transition from forest to shrub is related to tenure aspect, that partly caused by the process of transferring land rights. Problems often occur when the land right transfer process takes a long time, it raises various speculations on the use of resources. Utilization of resources that do not yet have a clear right are vulnerable to free riders that maximize the use of resources resulting in a tragedy of the common [22]. Transfer of land right itself has various contexts, including the process of transfer from production forests that can be converted (HPK) into other use areas. In order to get formal land right such as the right to cultivate (HGU), the land must be release formally from forestry region (Kawasan Hutan) to become non forestry region (APL). Exploitation of forest resources can result in deforestation as well as changes in land use and cover (LULCC) which were previously forested into grasslands and / or shrubs that can trigger FLF [Viedma, Moreno and Rieiro [23]]. According to Ardiansyah, Boer and Situmorang [24] that the majority of various fires in South Sumatra occurred outside the concession area with land cover in the form of shrubs. These findings can illustrate the land right is unclear, therefore there is implications for the occurrence of FLF.

Based on Table 2. It is known that FLF predictions in production forests have a high percentage. The high percentage is indicated because of the utilization of the forest itself. According to Nugroho [25], it is stated that the contract of forest management permit holders to the government does not explicitly and specifically regulate the use of environmentally friendly technologies. As is the case in utilizing forest resources, land clearing is done to prepare for planting, however most of these activities still use the slash and burn method so that they have a great opportunity for FLF. The method is still believed to be easy and provides many advantages including: improving soil structure, fertilizing treatment, suppressing weed growth and disease [26]. Based on that, the contractual relationship requires firmness regarding restriction and responsibility in detail, thus related to disaster incidents have clarity of responsible parties both preventive and corrective.

Furthermore, in relation to human activity and fuel, there are variables in the form of peat in the construction of the model. Indonesia is a country that has a large distribution of tropical peat which is located on three large islands (Sumatra, Kalimantan and Papua) reaching an area of around 14.9 million hectares [27]. Peat-lands contain a lot of organic material which is a carbon stock that can be used as an energy source. Peat-lands can provide many ecological and economic benefits, however, over-exploitation can cause damage so that it changes its nature. Damaged peat, in some cases will become dry and it will be flammable. Peat-land management must consider aspects related to FLF disaster mitigation. Referring to [28] that the wisdom of managers regarding the use of peat-lands must be in accordance with the carrying capacity of the land which is adjusted to the characteristics of the peat. While biophysical factors such as altitude, topography also play a role in FLF [29].

The socio-economic condition is also the driving factor of the FLF. The socio-economic condition of the community is directly related to the carrying capacity of the environment. Indicators shown include increasing population density[30], low per capita income [17, 30, 31], number of laborers, farming families and so on provide a correlation to FLF, then Aryono, Suhendang, Jaya and Purnomo [32] states that the trajectory of land use and spatial use through the process of deforestation and/or reforestation is related to the demographic transition and socio-economic transformation. The regulation instrument (restriction) can be applied to several factors which are the driving factors of FLF disaster. Spatial planning plays an important role in guiding land use change, one of which is sustainable agricultural expansion, which involves maintaining forest cover and local food production [33].

The regional spatial plan is a guideline for regional governments to determine the location of development activities in utilizing space and in compiling development programs related to spatial use

Hilal, S., Furth, P., Purnomo, J. et al. (2020) Land Right Transfer Process and its Implication for the Occurrence of Forest Land Fires (FLF) in Sumatra, Indonesian Development Activities in Utilizing Space and in Compiling Development Programs Related to Spatial Use. IOP Conf. Series: Earth and Environmental Science 504(2020) 012014 doi:10.1088/1755-1315/504/1/012014

\[HM: \text{Hak Milik (Right of Ownership)}\]
\[HP: \text{Hak Pengusahaan Hutan (Forest Concession)}\]
\[HGU: \text{Hak Guna Usaha (Cultivation Right)}\]
\[IUPHH: \text{Izin Usaha Pemanfaatan Hasil Hutan (Forest Product Utilization Permit)}\]
\[IUP: \text{Izin Usaha Pertambangan (Mining Permit)}\]
The role of spatial planning itself for optimal utilization of resources but as far as possible avoid conflicts between sectors, prevent environmental damage. However, these ideal conditions are often not achieved as indicated by the presence of environmental damage or disaster and land conflicts.

Table 2. Recapitulation of FLF Predictions for 2019-2029

| Region Status     | Spatial Pattern Plan | Function Plan               | Ha  | Percent (%) | Land tenure status* |
|-------------------|----------------------|-----------------------------|-----|-------------|---------------------|
| Forest Region     | Protection           | - Protected Forest          | 220.453 | 10.76       | TN,                 |
|                   |                      | - Nature Reserve and Nature Conservation Areas | 49.402 | 2.41       | HMHA                |
|                   | Cultivation          | - Production Forest        | 550.721 | 26.89       | IUPHH               |
|                   |                      | - Convertible Production Forests | 364.518 | 17.80       | HPH, TN             |
|                   |                      | - Limited Production Forest | 16.846 | 0.82       | HMNA                |
|                   | Sub-total             |                             | 1.201.940 | 58.68       |                     |
| Non Forest Region | Cultivation          | - Plantation               | 232.328 | 11.34       | HGU                 |
|                   |                      | - Other Culture Uses       | 391.857 | 19.13       | HM, Right with Local Legalities |
|                   |                      | - Agriculture              | 45.165  | 2.21       |                     |
|                   |                      | - Settlements              | 176.671 | 8.63        |                     |
|                   |                      | - Tourisms                 | 219     | 0.01       |                     |
|                   | Sub-total             |                             | 846.240 | 41.32       |                     |
| **Total**         |                      |                             | 2.048.180 | 100.00      |                     |

*TN: Tanah Negara (State Land),
HMHA: Hak Ulayat Masyarakat Hukum Adat (Ulayat Land Right)
HM: Hak Milik (Right of Ownership)
HPH: Hak Pengusahaan Hutan (Forest Concession)
HGU: Hak Guna Usaha (Cultivation Right)
IUPHH: Izin Usaha Pemanfaatan Hasil Hutan (Forest Product Utilization Permit)
IUPt: Izin Usaha Pariwisata (Tourism Permit)

According to information of the National Disaster Management Agency since 2003 - 2018 disaster trends in Indonesia increased. A planned, integrated and comprehensive mitigation effort in the spatial planning framework is important. Regional Regulation (PERDA) number 5 of 2015 contains the allocation of spatial use which is compiled in the spatial map of Central Kalimantan Province in 2015 - 2035. The spatial pattern further serves as a guideline for regional spatial use. However, the PERDA has not provided guidelines for FLF disasters. The PERDA appendix states that all districts/cities are prone to FLF disasters, the justification is less relevant in realizing readiness and setting priorities in terms of FLF disaster management. The FLF prediction provides an illustration of the various uses of space for the risk of fire threat. Furthermore, in Figure 8, it is known that it is an elaboration that various spatial use function plans still need to be reviewed and evaluated due to the high percentage of FLF predictions that occur.
Figure 8. Spatial planning based on FLF mitigation mapping

The prediction results related to the percentage of potential FLF disasters in the forest area is quite large. This phenomenon has a bearing on how regulatory instruments in the use of land resources and responsibilities are important to be enforced both in contractual, social aspects, ethical commitment to good environmental sustainability. The above problems reveal that the clarity of property right alone is not enough in sustainable land management and mitigation efforts in disaster. Based on KLF’s FLF monitoring system information shows that there was a sharp increase in FLF occurrences from August to September 2019. Central Kalimantan Province was one of the provinces that had the highest hotspots as of September 2019 namely 3651 points, with actual fire area ± 44769 hectares [35]. The built-in FLF prediction model can be verified well with the FLF occurrence conditions in various locations, therefore the importance of prediction information can be used as a basis for making FLF mitigation strategies.

4. Conclusion
The FLF model that has been formed has a good feasibility (robust) in explaining the factual occurrences of the FLF, that means the FLF occurrence was influenced by the variables which worked simultaneously. The FLF handling currently is more dominated by reactive actions, such as fire fighting and law enforcement. These have not yet touched the root of the problem, therefore the FLF became regular disasters.

The results of the factual analysis show that the FLF occurrences in various land tenure status with a total fire area of 16.5% of the total land area of Central Kalimantan. Related to the status of land tenure, this study shows that fire incidents in forest region are 70.67% and in the non-forest region are 29.33%. The FLF in the forest region occurred especially in production forest (29.53%) and convertible production forests (21.79%). Whereas in the non-forest region occur in plantation (HGU) (12.90%) and other culture uses (9.83%).

The data showed that the stronger the status of land tenure, the smaller the percentage of the FLF occurrences, such as land with HGU status and other culture uses with various types of land tenure status, with the legality granted by local government (village or adat) have lower the FLF occurrences than the forest production and convertible forest production land.

The clarity of the status of land right gives clarity on the regulations that must be obeyed, as well as the clarity of responsibilities that must be fulfilled by the holder of the land right. The higher magnitude of the FLF in the forest area may be caused by the unclear status of land rights, so that the
applicable restriction and responsibility are also unclear. This condition will cause the FLF prevention efforts in forest areas to have a greater difficulties than in the outside forest areas.

Without significant prevention efforts, the event prediction model in the next 10 years has a slightly downward trend, which is 13.3% of the total land area. Related to the land status shows that forest area is 58.68%, HGU is 11.34% and others title rights are 29.98%. To significantly reduce the FLF occurrences, especially in forest areas, it is necessary to clarify the status of land rights, so that the restriction and responsibility are clear.

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