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INTEGRATING GOVERNMENTS BODIES IN PEATLAND ENVIRONMENTAL MANAGEMENT TO ELIMINATE THE SECTORAL EGOs*

Deasy Arisanty^{1}, Herry Porda Nugroho Putro¹, Karunia Puji Hastuti¹,
Dedi Rosadi², Ismi Rajiani³, Muhammad Muhaimin¹**

*¹Department of Geography Education, Lambung Mangkurat University,
South Kalimantan 70123, Indonesia*

*²Department of Mathematics, Faculty of Mathematics and Natural Sciences, Gadjah Mada University,
Sekip Utara, 55281 Yogyakarta, Indonesia*

*³Department of Social Science Education, Universitas Lambung Mangkurat,
South Kalimantan 70123, Indonesia*

Abstract

Peatland fires are a constant problem during the dry season in Banjarbaru, Indonesia, extremely damaging the ecosystem. The central and local governments have made various efforts to tackle peatland fires. This study aims to analyze the role of local governments in managing peatlands and peatland fires to prevent environmental damage. This study uses a descriptive method with a Focus Group Discussion (FGD) approach. This study involved 28 respondents from community groups fighting land fires and local governments in Banjarbaru, South Kalimantan, Indonesia. Data was obtained using interviews, observation, and documentation. Data analysis used triangulation techniques (data reduction, display, and verification). The results show that the fires that occur are influenced by the lack of coordination and synergy between government agencies that play a role in overcoming peatland fires. In addition, the availability of good human resources, facilities, and infrastructure has not been well mapped. As a result, the sectoral ego becomes a problem in handling peatlands. Therefore, the synergy between the government and the community is needed in tackling peatland fires. The research results are expected to be material for evaluating and considering related parties in managing peatlands and peatland fires.

Keywords: ecosystem, environmental damage, management, peatland fires

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** Corresponding author: deasyarisanty@ulm.ac.id

1. Introduction

Peatlands play a crucial role in Indonesia's economic development (Arisanty et al., 2019). However, peatland use as agricultural cultivation is not well designed, resulting in environmental damage (Surahman et al., 2018; Yamamoto et al., 2020; Hsu et al., 2021; Mughal et al., 2022). Human activities have led to forest land changes, and land use on peat has also caused land fires. The existence of permits for peat-land conversion and protection of peatlands also adds to fire vulnerability (Lilleskov et al., 2019; Razzaq et al., 2021). Peatland fires are found in agricultural and plantation lands (Syaufina, 2018). Further, land conversion has led to repeated fires on peatlands (Uda et al., 2019). Oil palm and wood fiber concessions were higher than fires in protected forests and natural forest logging concessions (Adrianto et al., 2019; Xiang et al., 2021). Fires reduce the diversity of plants in the woods (Gholami et al., 2020).

The Indonesian government has issued many regulations related to peat governance (Uda et al., 2020) as government policies regarding peatlands' unique functions are needed to protect peatlands (Lilleskov et al., 2019). Several programs associated with the prevention of land fires have been initiated, including sanctions-based policies against arsonists, which are considered more effective than reward-based approaches in preventing land fires (Carmenta et al., 2020). Fires affect the symbiotic relationship of plants in the peat forest (Ahmadi et al., 2017). Since Kalimantan becomes the primary location of reducing emissions from deforestation and forest degradation (REDD+) (Rajiani and Pypłacz, 2018), performance-based incentives are also applied to increase policies' effectiveness in preventing land fires. However, the progress remains sluggish and unconvincing. The plan cannot succeed without continued social support and political will (Puspitaloka et al., 2020).

The National Disaster Management Agency or *Badan Nasional Penanggulangan Bencana* (BNPB) is Indonesia's leading government organization responsible for disaster management. Local governments prioritised to receive authority as coordinator of peatland fire management are the Regional Disaster Management Agency or *Badan Penanggulangan Bencana Daerah* (BPBD) and the Fire brigade *Pemadam Kebakaran* (DamKar). A peatland management strategy must be developed to address fires and haze (Astuti, 2020). Improving maintenance is also necessary (Kane et al., 2019). Apart from government actors, non-government actors also play an essential role in tackling land fires in Indonesia through a political ecology approach (Supeni et al., 2019). Cooperation between the government and the community needs to be created and enhanced (Ahmad et al., 2019; Karklina et al., 2020).

Peatland restoration in Indonesia was carried out in 2016-2020. The implementation of peat restoration was implemented in 7 priority provinces, namely West Kalimantan, South Kalimantan, Central Kalimantan, Jambi, Riau, South Sumatra, and Papua. Wetting is considered effective in reducing fire hazards (Sirin et al., 2020). The formation of BRG is a government effort to tackle forest and land fires in Indonesia (Alisjahbana and Busch, 2017). Several regions in the world, apart from Indonesia, have implemented peat restoration to restore peatlands from various disturbances (Chimner et al., 2016) because restoration is crucial in mitigating climate change and preventing peatland degradation (Ward et al., 2020; Warren et al., 2017). Because climate change affects the increase in the occurrence of fires (Karklina et al., 2020) Lack of information on the effects of climate change affecting fire prevention plans (Haidarian et al., 2021).

Land fires in the territory of Indonesia in 2015 based on data from <http://sipongi.menlhk.go.id> were: 2,611,411.44 ha; 2016 is 438,363.19 ha; 2017 is 165,483.92 ha; in 2018 is 529,266.64 ha; in 2019 is 1,649,258.00 ha, and in 2020 is 274,375.00 ha. South Kalimantan, which is one of the priority provinces for peat restoration, has quite many fires even though the area of peatland is the smallest compared to other provinces (Arisanty et al., 2019; Syaufina, 2018). Land fires in the South Kalimantan region in 2015 were 196,516.77 ha; 2016 is 2,331.96 ha; in 2017 is 8,290.34 ha; in 2018 is 98,637.99 ha; 2019 is 137,848.00 ha and in 2020 is 3,971.00 ha. Throughout 2019, the number of hotspots in the South Kalimantan region was 907,

with the highest hotspots in September. Meanwhile, in 2020, the number of hotspots is 35, with the most hotspots in September 2020. Peatland fires account for only 30% of total land fires in Indonesia, but their impact is much higher than on mineral soils due to fire density (Purnomo et al., 2017). Land fires in the South Kalimantan region are quite severe in the Banjarbaru area (Arisanty et al., 2019). Land fires in the Banjarbaru area are a problem because the Syamsudin Noor international airport is here. On September 13, 2019, six hotspots were scattered around the airport, namely 4 points in Gunung Damar Village, 1 point in the Trikora area, and 1 point in Liang Anggang Village.

The restoration program's success in the South Kalimantan Province will be less visible if the Banjarbaru area, the central government, and the airport area continue to burn (Arisanty et al., 2020). Therefore, there is a necessity for synergy between local governments to overcome land fires every year to prevent land fires and overcome land fires through various programs and infrastructure provisions. Based on the background, the purpose of this article is to analyze the role of local governments in managing peatland fires, analyze problems in peatland fire management, and analyze the synergy of local governments in managing peatland fires. These objectives to achieve, the research survey was conducted in Banjarbaru, Indonesia.

2. Research method

This study uses a descriptive method with a Focus Group Discussion (FGD) approach. This study involved 28 people from community groups fighting land fires and local governments in Banjarbaru, South Kalimantan, Indonesia. Respondents involved consisted of the South Kalimantan Provincial Forestry Service, Banjarbaru BPBD, Forest Fire Control Brigade (Manggala Agni) South Kalimantan Province, Banjarbaru Fire Department, and BASARNAS. The Banjarbaru area was chosen as the research area because most peatland fires occur in this area. The map of the research area can be seen in Fig. 1.

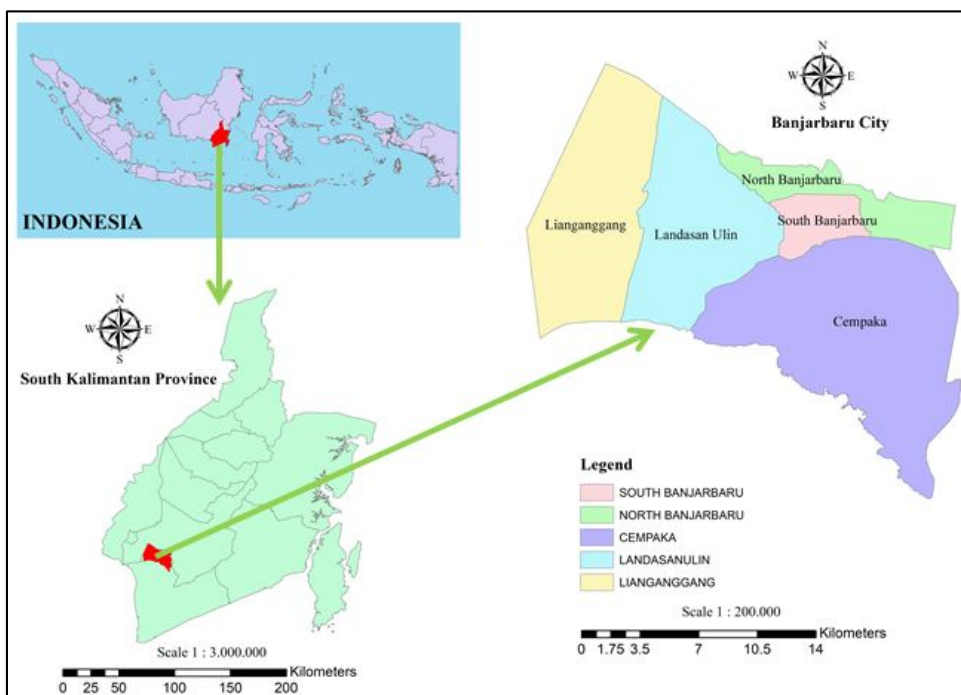


Fig. 1. Geographic location of research area

Data was obtained using interviews, observation, and documentation. The research was carried out for ten months of field observations. Indicators in the study can be seen in Table 1.

Table 1. Questions asked during Semi-structured interviews

<i>No</i>	<i>Questions</i>	<i>Rationale</i>
1	What are the roles of each agency for fire management?	The role of local government in land fire management
2	what is the role of MPA in supporting local governments in land fire management	The role of MPA
3	What are the types of equipment needed to prevent or fight a fire?	Equipment land fire management
4	What are problems in the field when peatland fire?	Land fire management problem
5	What was the effort of your agency when the fire broke out in the field?	Local government efforts
6	What is the synergy between agencies to tackle land fires?	Local government agencies synergies

Data analysis used triangulation techniques (data reduction, display, and verification). Validation of research data was carried out by cross-checking data between field observations and primary data collection obtained through interviews, FGDs, and secondary data obtained from agency documents. Data analysis used triangulation techniques (data reduction, display, and verification). First, the interviews and FGDs were reduced according to the research focus. The results are then described to obtain the results of the research. The data is then verified from primary and secondary data obtained from government agency data.

3. Results and discussion

3.1. The role of local governments in managing peatland fires

The government of Banjarbaru has made great efforts in dealing with fires, especially in peatlands, both in the context of preventing land fires and extinguishing fires when fires occur. BPDP has the primary task and function of fighting forest fires in Banjarbaru but is constrained by infrastructure, funds, and human resources. The needs when extinguishing land are firefighting equipment, water sources, public kitchens. Fire fighting equipment is used to extinguish fires, field post tents, fire engines, and water tankers. In addition, shared kitchens are needed to provide food in a fire to support the logistical needs of fire-fighters who extinguish fires during land fires. The role of government agencies in managing forest fires can be seen in Table 2.

The involvement of all government agencies is needed to combat peatland fires. Socialization of land fire prevention is required by involving the National and Political Unity Agency through religious harmony forums. Socialization is necessary to not burn land after and before planting in land preparation. Public knowledge and awareness of the impacts of fire are fundamental in determining land fire prevention. The Banjarbaru Food, Agriculture, and Fisheries Service can help disseminate information to the public about preparation and post-harvest without burning land. The Forestry Service can socialize this to the community by appealing not to burn forest areas.

3.2. Problems in fire management

The local government of Banjarbaru is having difficulty managing peatland fires. Efforts to control peatland fires can be seen in Table 3.

Table 2. The role of the agency for fire peatland managing

No	Agency	The role of peatland fire managing
1	Badan Penanggulangan Bencana Daerah (BPBD)= Regional Disaster Management Agency	Land fire disaster management
2	National Unity and Politics Agency, The Food, Agriculture, and Fisheries Department, Forestry Office, <i>Manggala Agni</i>	Socialization for the prevention of land fires
3	Social Services, Police	Provision of public kitchens, tent posts, and beds
4	Forestry Office, <i>Manggala Agni</i> , Fire brigade and BASARNAS	Provision of firefighting tools
5	Minister For Public Works and Human Settlements (PUPR)	Provision of water
6	Army, Police, MPA, Forestry Office, <i>Manggala Agni</i> , Fire brigade and BASARNAS	Power to extinguish the fire
7	Public Health Office, Community Health Center, PMI, Hospitals	Handling victim fires and smoke haze
8	TRGD, Environmental Services	Peatland restoration
9	<i>Masyarakat Peduli Api</i> (MPA)	Assist BPBD in firefighting

Table 3. The problem in fire management

No	The problem in fire management	Efforts to overcome
1	Limited water sources	Increase water sources by adding reservoirs, drilling wells, and irrigation channels Increase water sources by adding reservoirs, digging wells and irrigation channels
2	The distance between the water source and the fire location is far	Finding and providing water sources closer than the location of burning
3	Firefighters were inconsistent because of fatigue	The right technology in fire suppression can accelerate fire extinguishing so that it is more efficient
4	Transportation costs are high because of the long distance between the water source and the location of the fire	Finding and providing water sources closer than the location of burning
5	Shallow reservoir	Shallow reservoir dredging
6	Limited blackout equipment	Buy firefighting equipment, or synergize with other agencies in the use of fire extinguishers
7	The management of peatland fires that is still not in synergy	Synergize with each other in extinguishing peatland fires
8	Limited land fire management funds	The allocation of more funds for peatland fire prevention
9	Restoration program that is not optimal	Making the peatland area in Banjarbaru for the restoration area

Because they are far from burning land, limited water sources cause fires that are difficult to overcome (Santika et al., 2020). Water availability can reduce the risk of peatland fires (Moghaddam et al., 2021). Water sources in Banjarbaru are reservoirs, bore wells, and irrigation canals. Availability of shallow reservoir and only one fruit. Drilling wells are also limited in number and poor condition. Reservoirs need to be added, and shallow reservoir excavations carried out. Damaged wells can also be repaired and increase the number of drilled holes, especially in locations close to the fire site. PUPR is an agency that can increase the number of reservoirs and dug wells.

Not all government agencies have firefighting equipment, only a few agencies such as BPBD, forestry office, *Manggala Agni*, and fire brigade. Limited funds mean that the provision of

the equipment is also still limited. Some of the equipment was also in a damaged condition. The effort that can be done is by budgeting the purchase of tools. Sources of funds are from government agencies and other sources of funds, including firefighting equipment. Sectoral ego and commitment are also problems in handling land fires in the Banjarbaru area. The government has different strategies and interventions to deal with peatland fires that cause failure to tackle land fires (Jefferson et al., 2020). Governments, industry players, and communities have different land management strategies, which lead to failures (Jefferson et al., 2020). The solution that can be done is to have a coordinator who has the primary responsibility in handling land fires and can coordinate with all agencies. BPBD can be the coordinator in handling land fires. Other institutions from the government, private sector, and the community support the work of the BPBD in overcoming land fires.

3.3. Intersectoral synergy for peatland fire prevention

The synergy between sectors is needed for coordination when peatland fires occur. BPBD, the agency with the most crucial role in disaster management, needs to map out facilities and infrastructure, human resources, coordination patterns, and budget requirements. Partnerships between government agencies can meet the challenges of sustainable land and forest fires (Dupuits and Cronkleton, 2020). The mapping of facilities and infrastructure to deal with forest fires by the Banjarbaru government can be seen in Table 4.

Table 4. The facilities and infrastructure needed for firefighting from *BPBD*

No	Description	Total			Agency Cooperation
		Necessity	Available	Deficiency	
1.	Field post tent	5	2	3	Social Services, Police
2.	Bed	50	30	20	Social Service, Police
3.	Logistics car	5	1	4	Social Services
4.	Public kitchen truck	5	1	4	Social Services
5.	Kitchen equipment	10	0	10	Social Services
6.	Eating/drinking equipment	10	0	10	Social Services
7.	Lighting tool	5	1	4	<i>Manggala Agni</i> , Forest Offices
8.	Drone	2	0	2	-
9.	Fire extinguishers	23	10	13	<i>Manggala Agni</i> , Forest Offices, Fire Brigade, <i>BASARNAS</i>
10.	Water reservoir	2	1	1	<i>PUPR</i>
11.	Borewell	80	50	30	<i>TRGD</i>
12.	Water tanker	5	2	3	Fire Brigade, <i>Manggala Agni</i>
13.	Ambulance	10	10	0	Public Health Office, <i>PMI</i> , hospitals, and Community Health Centers

Based on Table 4, each agency has its role, which BPBD maps. The BPBD, which lacks the personnel to monitor hotspots, can be utilized by TNI, Polri, MPA, *Manggala Agni*, *Brimob*, and *BASARNAS* personnel. The need for extinguishing equipment can be coordinated with the South Kalimantan Provincial Forestry Service, *BASARNAS*, *Manggala Agni*, MPA, and the Fire

Department. Every year BPBD creates a joint command post, a combination of the TNI, Polri, Manggala Agni, MPA, and the Fire Department. A shared kitchen for fire fighting needs can be coordinated with the Social Service. Water sources to extinguish the fire can be coordinated with PUPR. Coordination between local government agencies can facilitate the work of BPBDs. As a result, handling land fires are no longer one-sided and overlap between agencies. The coordination model offered in this study for tackling peatland fires can be seen in Fig. 1.

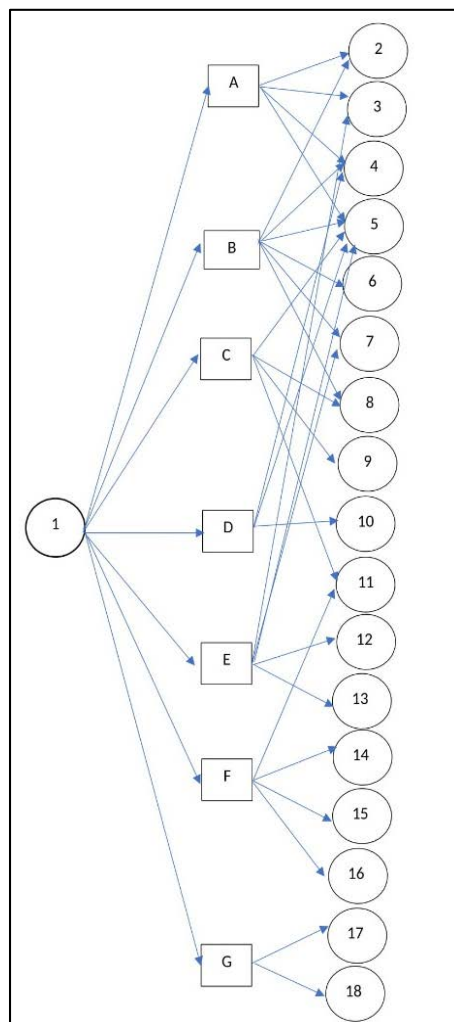


Fig. 4. Design of a network of cooperation between government agencies

The information in the Cooperation model between government agencies in dealing with forest fires can be seen as follows:

- | | | |
|------------------------------------|-------------------------|-----------------------------|
| 1: BPBD | 5: <i>Manggala Agni</i> | 14: Community Health Center |
| A: Firefighting equipment | 6: TNI | 15: Indonesian Red Cross |
| B: Firefighting power | 7: MPA | 16: Hospital |
| C: Public kitchen, post tend, beds | 8: Police | 17: The TRGD |
| D: Water sources | 9: Social Services | |
| | 10: PUPR | |

E: Socialization to the community	11: Public Health Office	18: Environmental Services
F: First aid to victims	12: National Unity and Politics Agency	
G: Peatland restoration	13: Food, Agriculture, and Fisheries Department of Banjarbaru	
2: BASARNAS		
3: Forestry Offices		
4: Fire brigade		

The handling of forest fires must involve government agencies with the same perception. Differences in perception can hinder the handling of peatlands. Differences in perceptions about fires lead to inconsistent policies dealing with land fires (Ince, 2018; Sandhyavitri et al., 2019). Similar perceptions can be made through coordination meetings between local government agencies and communities handling land fires (Rauf et al., 2020; Tata et al., 2018). Local governments need to have a firm commitment to dealing with land fires. Managing land fires requires a strong commitment from the government (Dupuits and Cronkleton, 2020).

Coordination between agencies is needed to overcome various problems in the field when a fire occurs. Coordination needs to be improved given the relatively complex fire-fighting peatlands (Rauf et al., 2020). BPDP collaborating with other government agencies is very important in handling land fires because one agency cannot handle land fires. Cooperation between local government agencies can deal with land fires more quickly (Puspitaloka et al., 2020). BPDP can facilitate coordination meetings involving other agencies. The formation of an acceleration team for fire prevention can be formed based on a coordination meeting involving government agencies and the community. Involving civil society organizations, village community members, and village officials in handling forest fires can accelerate the handling of land fires (Tata et al., 2018).

4. Conclusions

Peatland fires that continue to occur are caused by the handling of land fires that are not integrated and not well coordinated. The synergy between the government and the community is needed in tackling peatland fires. The availability of good human resources, facilities, and infrastructure has not been well mapped. The sectoral ego becomes a problem in handling peatlands. The research results are expected to be material for evaluating and considering related parties in managing peatlands and peatland fires.

The study results provide a synergistic design between local government agencies and the MPA tackling peatland fires. BPBD, as the leading agency responsible for disaster management, can synergize in handling land fires with other agencies and KKL to overcome fires.

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