

**INTERNATIONAL TROPICAL TIMBER ORGANIZATION  
ITTO  
PROJECT DOCUMENT**

<b>TITLE:</b>	<b>CAPACITY BUILDING ON FOREST AND LAND FIRE MANAGEMENT IN INDONESIA</b>
<b>SERIAL NUMBER:</b>	<b>PP-A/ 56-340-1</b>

**SUMMARY**

In Indonesia, uncontrolled and unmanaged burning practices have become a serious problem because these activities have in the past caused and continue to cause catastrophic fires that disrupt human health, transportation, environment, and other daily activities. These problems should be addressed with integrated measures and approaches. Since human activities have become a main factor in forest and land fire in Indonesia, effective involvement of local community is fundamental and capacity building programmes for the forest and land fire brigades is critical for the prevention and reduction of forest and land fires in the field.

The objective of this project is to reduce the occurrence of forest and land fires in targeted areas by strengthening capacity building in forest and land fire management and zero burning practices and by increasing prevention activities with technology improvements and development of practical guidelines. The project has three outputs: (1) Best agricultural practices applied; (2) Strengthened management capacity to address forest and land fires problems and (3) Forest and land fire prevention actions increased and cooperation strengthened among local institutions, the private sector and communities for forest fire prevention.

The expected outcomes after the project completion are : Fire Care Community (*Masyarakat Peduli Api*) groups become the agents of change in forest and land fire prevention through best agriculture practices/ sustainable agricultural and silvicultural management in their neighborhoods and implementing zero burning practices; performance of the Forest and Land Fire Brigade (*Manggala Agni*) and government officials on forest and land management will be improved and they respond effectively to forest and land fires; and participation of all stakeholders in forest and land fire prevention will increase with improved coordination and communications related forest and land fire issues.

In order to achieve these outcomes, the project will conduct a series of training for Forest and Land Fire Brigades (*Manggala Agni*), Fire Care Community (MPA) and government officials. Integrated prevention patrols will also take place in the fire prone villages. The project will be implemented in coordination with stakeholders and representatives of Regional Climate Change and Forest and Land Fire Agency in Kalimantan and Sumatera.

**EXECUTING AGENCY:** DIRECTORATE OF FOREST AND LAND FIRE MANAGEMENT (DFLFM), DIRECTORATE GENERAL OF CLIMATE CHANGE, MINISTRY OF ENVIRONMENT AND FORESTRY, REPUBLIC OF INDONESIA

**DURATION** 12 MONTHS

**APPROXIMATE STARTING DATE** 1 June 2020

**PROPOSED BUDGET AND**

<b>OTHER FINANCING SOURCES:</b>	<b>Source</b>	<b>Contributions in US\$</b>
	ITTO (Government of Japan)	<b>1,105,263,16</b>
	DFLFM, MoEF	26,400.00
	<b>TOTAL</b>	<b>1,131,663.16</b>

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## PROJECT BRIEF

In Indonesia, forest fires occur almost every year especially in dry season. Many researchers stated that almost 99% of forest and land fires in Indonesia are caused by human activities. Local communities in Indonesia are familiar with the use of fires in traditional livelihood activities, such as land and post-harvest vegetation clearing, agriculture preparation, hunting, camping, etc. Use of fires in farmland preparation has long been practiced in almost every part of the world, not only in Indonesia but also in other countries which practices traditional agriculture since the use of fires in farm or agricultural preparation is quick, easy and cheap. Historically, local communities with their local wisdom have played a significant role in the management of fires for many years. However, changes in land use patterns, social conflicts, and economic growth often change these fire use patterns and practices.

According to various studies and experiences, forest and land fires in Indonesia has negative impacts on health, ecosystems, the economy, transportations and politics etc; loss of forest cover and natural wildlife habitats and damage to forest and land including peatland ecosystems. Key problems should be identified to address the repeated occurrence of forest and land fires especially in the dry season. The key problems identified by the stakeholder meeting are highlighted as follows:

- 1) Negative impacts on health, ecosystems, economy, transportation, politics etc
- 2) Loss of forest cover and natural wildlife habitats,
- 3) Damage to forest and land including peatland ecosystems,
- 4) Insufficient comprehensive policies and operational regulations on forest and land fire prevention

Three main causes of the key problems that have been identified are: 1) poor agricultural practices carried out by local communities; 2) limited management capacity of institutions to address forest and land fire problems; and 3) limited actions in the prevention of forest and land fire.

Upon completion of the project, best agricultural practices without burning applied by Fire Care Community (MPA)/local communities; management capacity to address forest and land fires problems strengthened; and cooperation among local institutions, the private sectors and communities for the prevention of forest and land fires strengthened.

The beneficiaries of the project are a wide range of stakeholders, local communities, local governments, private sector such as logging companies, forest plantation companies and agriculture plantation business, related ministries and government agencies such as Peatland Restoration Agency, universities, NGOs and international organizations.

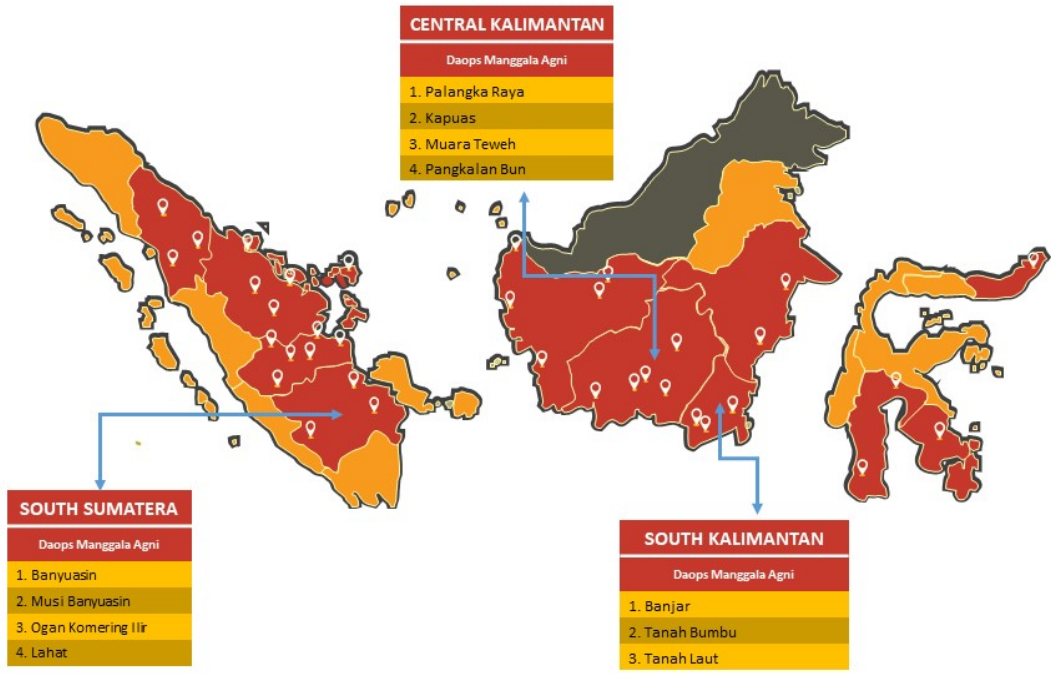
For the sustainability of activities, capacity building activities on forest fire prevention will be undertaken for all involved stakeholders at the national and local levels. The effective monitoring and networking among all relevant stakeholders will be maintained. The proposed total project budget is US\$ **1,131,663.16**. The project funds in the amount of US\$ **1,105,263.16** are expected with the support of ITTO/the Government of Japan. The counterpart contribution is expected to be provided by the Executing Agency for the amount of US\$ **26,400.00**.

## LIST OF ACRONYMS AND ABBREVIATIONS

BMKG	Meteorological, Climatological and Geophysical Agency
BIG	<i>Badan Informasi Geospasial</i> (Geospatial Information Agency)
BPPT	Agency for the Assessment and Application of Technology
CATIE	Center for Research and Training in Tropical Agriculture
DFLFM	Directorate of Forest and Land Fire Management
FCP	Program of Community Development of Fires Control in Peat Land Area
FDRS	Fire Danger Rating System
FFPMP	Forest Fire Prevention and Management Project
GIS	Geographic Information System
GFMC	Global Fire Monitoring Center
IIRR	International Institute for Rural Reconstruction
ITTO	International Tropical Timber Organization
JICA	Japan International Cooperation Agency
LKj	Laporan Kinerja (National report of forest fire in Indonesia)
LAPAN	The National Institute of Aeronautics and Spaces
MA	<i>Manggala Agni</i> (Forest and Land Fire Brigade of MoEF)
MPA	<i>Masyarakat Peduli Api</i> (Fire Care Community)
MODIS	Moderate Resolution Imaging Spectroradiometer
MoEF	Ministry of Environment and Forestry
NOAA	National Oceanic and Atmospheric Administration
NGO	Non-Government Organization
PLTB	<i>Pembukaan Lahan Tanpa Bakar</i> (Land preparation without burning)
PM	Atmospheric Particulate Matter
Pusdiklat	<i>Pusat Pendidikan dan Pelatihan</i> (Education and Training Forestry Center)
RPJMN	<i>Pencana Pembangunan Jangka Menengah Nasional</i> (National Strategic Plan)
SOP	Standard Operational Procedure
RFMRC SEA	Regional Fire Management Resource Center-South East Asia-
SMART	Spatial Monitoring and Reporting Tool
UNFCCC	United Nation Framework Convention on Climate Change

# PROJECT AREA

## LOCAL FIRE STATIONS (DAOPS MANGGALA AGNI)



## **PART 1: PROJECT CONTEXT**

### **1.1 Origin**

In recent years, forest fires have risen in global attention as an environmental and economic issue. Fires are considered a threat to sustainable development because of their direct effects on ecosystems, contribution to carbon emissions and impact on biodiversity. Fires in peat areas generate smoke haze that causes negative impact on health, daily activities, transportation, education and regional cooperation. According to the research study published in the Atmospheric Chemistry and Physics journal, researchers conducted field measurements during 2015 El Niño in Central Kalimantan, showing that the smoke haze from peat fires contained 90 gases that are harmful for health and contribute to greenhouse gas emissions since the smoke haze contains carbon dioxide, carbon monoxide and methane (Stockwell, 2016). Another study that has been conducted in Central Kalimantan and published in Springer shows that the average increase in the annual mean PM 2.5 concentration due to peatland fires in Central Kalimantan was 26 µg/m<sup>3</sup>, which is more than twice the recommended value of the World Health Organization Air Quality Guidelines. The increase of PM 2.5 leads to increased occurrence of a range of air pollution related diseases and premature mortality. The number of premature mortality cases can be estimated at 648 cases per year (26 mortality cases per 100,000 population) among others due to chronic respiratory, cardiovascular and lung cancer (Hein, 2019).

Fires in Indonesia occur almost every year especially in the dry season. Many researchers stated that forest and land fires in Indonesia are almost 99% caused by human activities. Local communities in Indonesia are familiar with the use of fire in traditional livelihood activities, such as land and post-harvest vegetation clearing, agriculture preparation, hunting, camping, etc. Use of fire in farmland preparation has been conducted since a long time ago in almost every part of the world, not only in Indonesia but also in other countries which practice traditional agriculture since using fire in farm or agricultural preparation is fast, easy and cheap. Historically, local communities with its local wisdom have played a significant role in the management of fire in many years. Nevertheless, changes in land use patterns, social conflict, and economic growth often change these patterns and practices of using fires.

Sahardjo (2003) stated that in shifting cultivation, fire has been used since thousands of years ago because it is easy, quick, and cheap, and farmers think that the soil can get nutrients from the ashes. According to Sadjati (2012), farmers using fire in farmland preparation assumed that the soil would become more fertile after being burnt, but disregard the hazard that occurred from uncontrolled burning. While few of the burning activities are ecologically sound and useful, many of them were harmful and damaging to the environment. People often have the opinion that by burning the land, it can fertilize the soil. However, researchers suggest that excessive and uncontrolled land fires actually result in infertile soil (poor nutrient) and can cause loss of soil organisms that may have important roles in soil fertility.

Big forest and land fires occurred in Indonesia in 1982/1983, 1997/1998, 2006, 2009, 2014, 2015 and 2019 with varying scales and intensities. Fires during 1997/1998 especially in Sumatera and Kalimantan burnt an area of 11.7 million ha, while in the fire season in 2015 burnt area is estimated to be 2.1-2.6 million ha (Albar, 2016). The last fire season in 2019 estimated burnt area was about 1.6 million ha. In 1993, ITTO supported a project "Establishment of a Demonstration Plot for Rehabilitation of Forest Affected by Fire in East Kalimantan". In addition, JICA has consistently supported the Ministry of Forestry (MoEF) on forest fire prevention, among others, Forest Fire Prevention and Management Project (FFPMP) in 1996-2006 and "Program of Community Development of Fires Control in Peat Land Area (FCP)" in 2013.

For more than two decades, previous actions to combat the fires focused on suppression activities. However, the 2015's fire, transboundary haze pollution occurrences and Indonesia's commitment to climate changes issues on COP-21 UNFCCC that was held in Paris on 2015 encouraged Indonesia to change approaches into focusing on prevention activities. The President of Republic of Indonesia issued Presidential Directives since 2016 until 2019 (each year) to prove Indonesia's strong commitment in addressing forest and land fire problems. In general, Presidential Directives consists of mechanisms to strengthen prevention, field operation, law compliance and enforcement. Prevention activities that have been conducted are as follows: integrated prevention patrol, routine patrol, early detection and early warning system, peatland management, campaign and socialization, establishment of Fire Care Community (MPA), biomass utilization "Zero Burning Policy" (*Pembukaan Lahan Tanpa Bakar*), and community assistance program. The prevention activities are focused on increasing awareness and participation of communities at village level and integrated prevention patrol to

prevent forest and land fires. Currently, mainstreaming forest and land fire prevention in Indonesia is a key agenda to tackle the forest and land fire problem. Prevention activities could contribute to reducing hotspots and forest and land fires occurrences, increasing public awareness in preventing forest and land fires and improving community welfare.

In order to strengthen prevention activities, the MoEF established the Forest and Land Fire Brigades called Manggala Agni since 2002 in 12 fire prone provinces in 34 Local Fire Station (*Daops Manggala Agni*) with consists of 1,875 personnel. The insufficient number of Manggala Agni encourages MoEF and other Institutions to establish Fire Care Community (*Masyarakat Peduli Api/ MPA*) on a voluntary basis. Currently, there are 704 groups of MPA with 10,569 members in 28 provinces. Manggala Agni has trained the members of MPA with basic knowledge of forest and land fire control. The members of MPA are expected to be the “agent of change” in their community regarding forest and land fire prevention.

In terms of prevention, the MoEF launched integrated prevention patrols since 2016, although they still need improvement to achieve the effectiveness and efficiency of integrated patrol programs. This program targets 8 fire prone provinces, namely: North Sumatera, Riau, Jambi, South Sumatera, West Kalimantan, Central Kalimantan, East Kalimantan, and South Kalimantan. A team of integrated prevention patrol consists of Manggala Agni, MPA, Police, Army, Forest Rangers and representatives of local governments. Besides the new program called integrated prevention patrol, MoEF also conducts routine patrols outside the integrated prevention patrol areas. Both patrols aim to prevent, monitor, and conduct early suppression of forest and land fires.

According to the burnt area calculation using Landsat 8 imagery, the data showed that the largest burnt area in 2019 was located in South Sumatera Province (328,457 ha), followed by Central Kalimantan with a total burnt area of 303,881 ha while burnt area in South Kalimantan Province was recorded at around 136,428 ha. These three provinces also have large areas of peatland that are very prone to fire in the dry season. The area of peatlands in three provinces from the widest to the smallest in sequence is Central Kalimantan with around 2,659,000 ha, South Sumatera with around 1,262,000 ha and South Kalimantan with around 106,000 ha. These data indicate that it is important to increase prevention activities in these areas.

This project will support the Government of Indonesia to conduct prevention activities. The project will involve Manggala Agni and MPA as the main key actors in forest and land fire control and prevention at site level (village level) through training and integrated prevention patrol in 3 fire prone provinces in Indonesia. The project also will support government officials to strengthen their capability to conduct effective and efficient forest and land fire management to address forest and land fire problems.

## **1.2 Relevance**

### **1.2.1 Conformity with ITTO's objectives and priorities**

#### **(1) Compliance with ITTO Guidelines on Fire Management in Tropical Forest**

By aiming to reduce the occurrence/frequency of forest and land fires especially in the dry season, this project is consistent with ITTO objectives and priorities as well as relevant national policies. Indonesia national policies related to forest and land fires put priority on the reduction of burnt areas in fire prone provinces focusing on prevention activities. This target is stated in the Strategic Plan of MoEF of Indonesia 2020-2024. This project complies with principle 1, principle 16 and principle 24 of the ITTO Guidelines on Fire Management in Tropical Forest as indicated in the followings:

- a. Principle 1 Policy Development, Recommended Action 1
  - Identify local communities, concession holders, timber companies, contractors, conservation non-governmental organizations (NGOs), women's groups, and other voluntary organizations to assess their interest and capacity to forge partnerships with government authorities in fire management programs. Where necessary, assistance will be provided by government authorities in the development of such organizations.
  - A national fire policy forming an integral part of the national land use policy, and assuring sustainable forest management, should be formulated and accepted by all relevant parties, including government, local communities, and the private sector.
  - Establish, and effectively staff and fund, a decentralized national agency, or strengthen an existing institution responsible for the establishment and implementation of an effective fire policy.

- Enact and/or revise national and local laws and regulations regarding the proper use of fire to ensure the effective implementation of fire management policies.
  - Create a system of incentives and sanctions, which will encourage responsible use of fire at all levels, including timber felling and sawmilling.
- b. Principle 16,
- Promote improved agricultural and agrosilvopastoral systems as alternatives to shifting cultivation.
  - Establish model demonstration areas for specific farming and agrosilvopastoral practices combining them with other components of a fire management system (e.g. integrating farming and grazing activities to modify fuel loads or fuel break systems).
  - Develop suitable incentive programs to reward communities and individuals which use appropriate land-use practices, resulting in reduced fire damage. In the case of individuals, it is often effective to make formal recognition in the presence of peers, that the individual has done something special. Develop and promote an environmental awareness program on the relation between social, economic, and environmental benefits derived from forests, and the negative impacts associated with wildfires.
  - Establish a program to investigate the causes of wildfires, and the underlying reasons. This should form the basis for formulating a wildfire prevention, education, and extension program.
  - Develop and implement programs following the principles of regenerative agriculture to promote nutrient cycling so that biomass is utilized to enhance soil fertility. These programs should consider sustainable agricultural practices promoted and disseminated by organizations such as the IIRR (International Institute for Rural Reconstruction), CATIE (Center for Research and Training in Tropical Agriculture), and grassroots level NGOs.
  - Demonstrate a variety of land treatment and soil preparation practices, which apply viable and inexpensive soil and water conservation techniques. Consider establishing demonstration plots where fire is not utilized as a tool in site preparation or land clearing.
- c. Principle 24, Recommended Action 24
- Concession holders, timber companies, and contractors should provide assistance to organize and provide support to local communities; encouraging their active participation in forest fire prevention programs.
  - Some forest-based activities of local communities involve the use of fire. Such activities should be regulated through measures, which reduce the risk of wildfire starts from these activities. Conflicts and misunderstanding between local communities and forest concession workers must be avoided through regular dialogues, and respect for local traditions and sensitivities. Concession holders, timber companies, and contractors for any employment opportunities or facilities, which become available, must always consider the welfare and well-being of local communities.
  - Assist communities in their efforts to enhance respect for traditional values and customs, which have historically preserved natural resources.
  - During periods of extreme fire danger, access to forests for recreational pursuits should be strictly controlled. Camping should be restricted to certain sites where facilities such as stoves should be provided. Elsewhere, the use of fires for cooking should be prohibited.
  - Patrols should be undertaken in areas frequented by people to ensure compliance with rules and regulations in force. Such patrols should be more intensive during periods of high fire risks or during holiday seasons.

This project is expected to contribute to addressing specific national, socioeconomic and natural problems related to fires in natural and planted tropical forests in Indonesia in accordance with the guide of ITTO Guidelines on Fire Management in Tropical Forest.

## **(2) Compliance with ITTO priorities (ITTO Strategic Action Plan 2013-2018)**

Strengthening the forest fire governance in the priority areas will be ensured through the capacity-building component addressed to community organizations and authorities, as well as through the development of stakeholder coordination mechanisms in the field of forest management in problem areas (consistent with Strategic priority1). Furthermore, the project seeks to reduce the degradation of tropical forests by improving their conservation so as to maintain the provisions of environmental services and promote sustainable forest management, which in turn will contribute to national and, in particular, local economies (Strategic priorities 3, 4 and 2).



### 1.2.2. Relevance to the submitting country's policies

The formulation of this proposal conforms to the Indonesian national policy and the new existing regulations which are stated in the National Strategic Plan 2020-2024 (RPJMN). This project also supports the implementation of the following policies:

1. President Instruction No. 3 2020 concerning Strengthening Control on Forest and Land Fire
2. Minister of Environment and Forestry Regulation No P.32/ MenLHK/Setjen/Kum.1/3/2016 on Forest and Land Fires Control.
3. Decision MoEF No 8/MENLHK/SETJEN/KUM.1/3/2018 concerning Procedures for field checking hotspots and / or forest and land fire information.
4. Decision MoEF No P.8/Menlhk/Setjen/Kum.1/2/2018 concerning Technical Criteria for preparedness and emergency land and forest fires.

### 1.3 Target area

Target areas of the project are divided into two as follows:

- a. Output 1 and output 2 are targeted at provincial level namely: South Sumatera, Central Kalimantan and South Kalimantan.
- b. Output 3 is targeted at national level.

#### 1.3.1 Geographic Location

- a. South Sumatera Province

*Sumatera Selatan* or South Sumatera Province is located on the southeast of the island of Sumatera which lies south of the equator at 2°45"S and 103°50'E. The province is bordered by several provinces: Jambi in the north, Lampung in the south and Bengkulu in the west while in the east the Bangka Strait separates the province with the Bangka Belitung Islands Province.

- b. Central Kalimantan Province

Central Kalimantan Province is located on the island of Borneo with its capital Palangkaraya. This province is the third largest Indonesian province with an area of 153,564.5 km<sup>2</sup>, about 1.5 times the size of the Java Island. It is bordered by West Kalimantan and East Kalimantan provinces in the north, by the Java Sea in the south, by South Kalimantan and East Kalimantan provinces in the east and by West Kalimantan province in the west. The coordinates of the province is 2°13'S and 113°55'E.

- c. South Kalimantan Province

South Kalimantan Province is located on the island of Borneo, located in 2°30'S and 115°30'E. South Kalimantan has a total area of 37,377.53 km<sup>2</sup> and is divided into four regions, namely Kotabaru, Banjar, Tabalong, and Banjarmasin city. Geographically, South Kalimantan is in the southeastern part of the island of Borneo, has a low-lying area in the west and east coast and a plateau formed by the Meratus Mountains in the middle. South Kalimantan consists of two main geographic features, namely the lowlands and the highlands. This province is bordered by the Makasar Straits in the east, Central Kalimantan in the west and north, the Java Sea in the south and east Kalimantan in the north. The province also includes the island of Laut located off the eastern coast of Kalimantan. The province is divided into 11 regencies and 2 cities.

#### 1.3.2 Social, Cultural, Economic and Environmental Aspects

- a. South Sumatera Province

The population in South Sumatera Province is estimated at around 8,497,196. The province is inhabited by many different ethnic groups with the Malays being the largest ethnic group. Most speak Palembang Malay which is mutually unintelligible to both Indonesian and standard Malay. Other ethnic groups include the Javanese, Sundanese, Minangkabau and Chinese. Most are concentrated in urban areas. The culture of the province of South Sumatera is largely influenced by Malay culture. South Sumatera's cultural wealth includes traditional houses, traditional clothing, various types of dances as well as typical

food from the area. The cultural wealth of South Sumatera is not only popular within the South Sumatera region itself.

There are five sectors that support economic growth in South Sumatera, such as the processing industry, mining, agriculture, construction, and retail. South Sumatera's economic growth is also supported by tourism. The area of this province consists of swamps, peatland and mineral soil and the vegetation is dominated by lowland vegetation, palmate plants, mangrove, rubber, oil palm, and agriculture plantations, especially coffee, tea and vegetables. Mount Dempo is the highest point in this province. This region has a tropical monsoon climate. Throughout the year the province is only affected by two seasons, namely the rainy season and the dry season. The air temperature varies from 24.7 to 32.9 degrees Celsius with air humidity levels ranging from 82% to 88%. The rainy season falls from October to April and December is the month with the most rainfall while the dry season usually starts in June to September.

b. Central Kalimantan Province

There are three major Dayak tribes in Central Kalimantan, the [Ngaju](#), Ot Danum and Dusun Ma'Anyan Ot Siang. The three major tribes extend into several branches of prominent Dayak tribes in Central Kalimantan such as Lawangan, Taboyan, Dusun Siang, Boyan, Bantian, Dohoi and Kadori. Besides the indigenous Dayak tribes, there are also ethnic groups from other areas of Indonesia, including Javanese, Madurese, Batak, Toraja, Ambonese, Bugis, Makassar, Papuan, Minang and Banjarese, Balinese and also Chinese. The center of the province is covered with tropical forest, which produces rattan, resin and valuable timber such as Ulin and Meranti. The southern lowlands are dominated by peatland swamps that intersect with many rivers. Sebangau National Park located in this province is a protected peatland area internationally acknowledged as sanctuary for the endangered Orangutan. The province's climate is wet weather equatorial zone with an eight-month rainy season, and 4 months of dry season. Rainfall or precipitation is 2,776 - 3,393 mm per year with an average of 145 rainy days annually. The population of Central Kalimantan Province is around 2,649,803.

c. South Kalimantan Province

The population of South Kalimantan was recorded at just over 3.6 million people in 2010 and at nearly 4.0 million in 2015. The latest official estimate in 2017 is 4.1 million. South Kalimantan is the traditional homeland of the Banjar people. Other ethnic groups also inhabit the province, such as several group of the Dayaks and Javanese. The area of forest in South Kalimantan is 1,659,003 hectares, including: protected forests, natural forests, permanent production forests, limited production forests, conversion forests and mangrove forests. Some are tropical forests and are protected by the government. South Kalimantan Province is known as "the land of a thousand rivers", which is due to its large number of rivers. From these rivers, one of the well-known rivers is the Barito Rive, commonly used for buying and selling floating markets. This region has a tropical monsoon climate, similar to most other Indonesian provinces. The main product of agriculture in this province is rice, corn, cassava and sweet potatoes. Fruits consist of oranges, papaya, bananas, durian, rambutan and many other local species. Palm oil is also a common product that can be found in South Kalimantan.

#### 1.4. Expected Outcomes at project completion.

The expected outcomes of the project are as follows:

- Fire Care Community (*Masyarakat Peduli Api*) groups become the agent of changes in forest and land fire prevention through best agriculture practices/sustainable agricultural and silvicultural management to their neighborhoods and implementing zero burning practices.
- Improved performance of Forest and Land Fire Brigade (*Manggala Agni*) and government officials on forest and land management, and effective response to forest and land fires.
- Participation of all stakeholders in forest and land fire prevention is increased with improved coordination and communications on related forest and land fire issues.

## PART 2: PROJECT RATIONALE AND OBJECTIVES

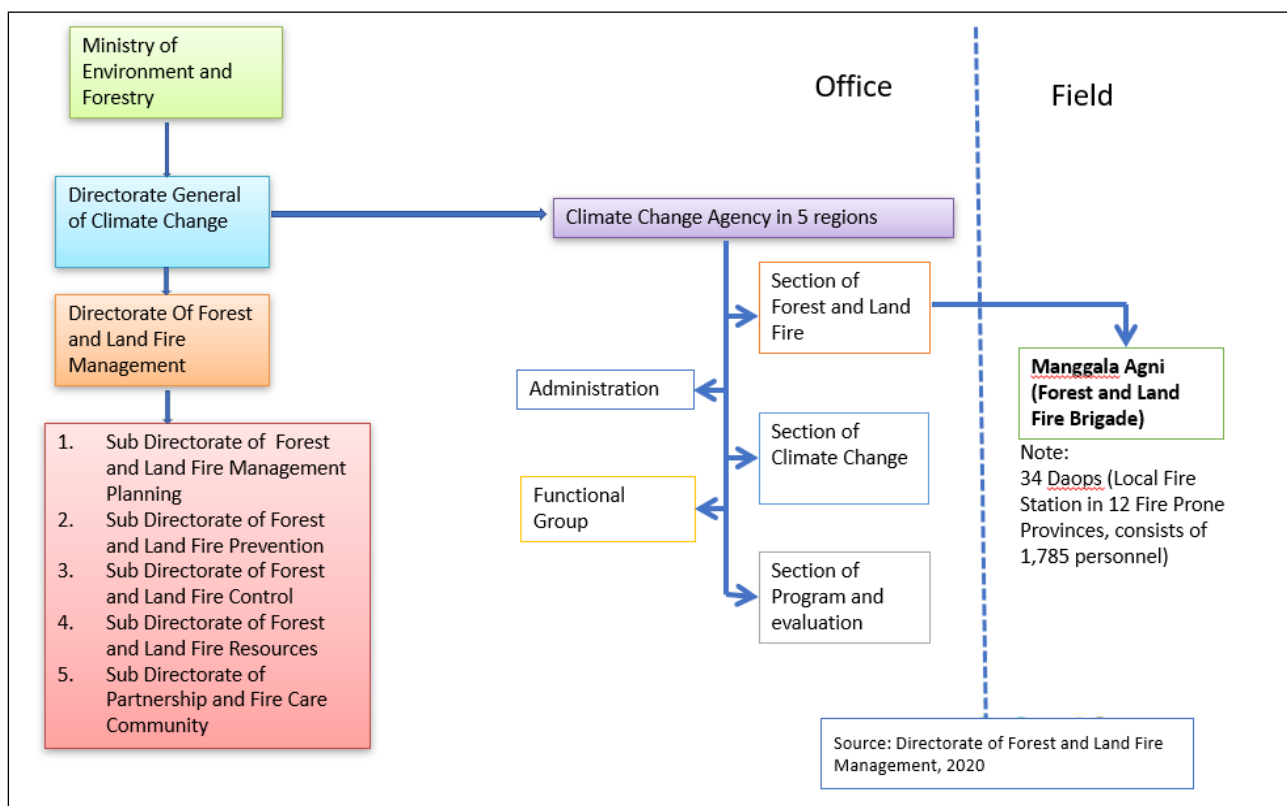
### 2.1. Rationale

#### 2.1.1 Institutional set-up and organizational Issues.

The Directorate of Forest and Land Fire Management (DFLFM) has the function and task to develop, implement, coordinate and synchronize policy, technical assistance, evaluation and supervision on forest and

land fire management. The main target beneficiary groups consist of local community, Fire Care Community/*Masyarakat Peduli Api (MPA)*, local government/agencies, Forest and Land Fire Brigades (*Manggala Agni*).

Indonesia has had concerns on forest and land fires for years. In the earlier years, the issue of forest fires was handled by the Forestry Services and subsequently handled by the Directorate General of Forestry, Ministry of Agriculture. In 1988, the Directorate General of Forestry was changed to MoEF and in this period, forest and land fires issues was handled by the Forest Fire Section under the Directorate of Forest Protection, Directorate General of Forest Protection and Nature Conservation (PHPA). In order to respond to the increasing problem of forest and land fires, the organization was upgraded from Forest Fire Section to Sub-Directorate of Forest Fire Control, under the Directorate of Forest Protection in 1994. Triggered by forest fires and smoke pollution in 1997-1998 where fires were identified not only in the forest but also on the land outside the forest area, especially plantations, the government established the Directorate of Forest and Plantation Fire Control under the Ministry of Forestry and Plantation in 1999. Subsequently, in 2004 the organization was changed and the forest fires issues was handled by the Directorate of Forest Fire Control under the Ministry of Forestry. Lastly, after some national policy changes in 2015, the Ministry of Forestry and Ministry of Environment merged into Ministry of Environment and Forestry, so that the Directorate of Forest Fire Control was changed to Directorate of Forest and Land Fire Management. Directorate of Forest and Land Fire Management consists of 5 Sub-Directorate as shown at the organizational structure below. Directorate of Forest and Land Fire Management has been experienced in some projects funded by donors such as The Program of Community Development of Fires Control in Peatland Area, Forest Fire Prevention and Management Project.



MoEF has an early warning and detection system in place called Sipongi, accessible at: [www.sipongi.menlhk.go.id](http://www.sipongi.menlhk.go.id). It has also been developed into a mobile application. Directorate of Forest and Land Fire Management (DLFFM) built an early warning system since 1996-2006 with JICA assistance through the Forest Fire Prevention Management Project Phase I-II. DFLFM also built and developed the Fire Danger Rating System (FDRS) with the Canadian Forest Service together with Agency for the Assessment and Application of Technology (BPPT), LAPAN (The National Institute of Aeronautics and Spaces) and Meteorological, Climatological and Geophysical Agency (BMKG) in 2001-2004. In addition, the Directorate developed the Fire Watch Indonesia in collaboration with Australia (AusAid) in 2007-2009. Until now, forest and land fire monitoring systems use near real-time data from NOAA, Terra-Aqua (MODIS), NPP-Suomi, Landsat and Himawari satellites supported by LAPAN and BMKG which can be accessed via [sipongi.menlhk.go.id](http://sipongi.menlhk.go.id) and is directly connected to the operation/situation room of the DG of Climate Change for the decision making process. However, there are still some innovative technologies that still need to be

developed to support the monitoring system, such as remote sensing and GIS modeling to estimate burnt area and SMART patrol application for reporting.

A training programme is very much needed for Fire Care Community/MPA, since there are numerous Fire Care Community groups that have been established in Indonesia where they lack knowledge on Land preparation without Burning. Land Preparation without Burning can be achieved through sustainable agricultural and silvicultural management techniques and the development of zero burning practices. Guidelines, regulations and programmes on fire management are available, but still lack implementation due to limited national budget.

### 2.1.2 Stakeholders analysis

The Project will bring direct benefit to local communities and regions through the involvement of the Fire Care Community (*Masyarakat Peduli Api*), Forest and Land Fire Brigade (Manggala Agni) in the targeted areas where the project activities will be implemented. A detailed list of project stakeholders/beneficiaries is shown below:

Stakeholder group	characteristics	Problems, need and interests	Strengths	Relationships with the project
<i>Primary stakeholders</i>				
Forest and Land Fire Brigade (Manggala Agni)	The main brigade in forest and land fire control in the field	Need capacity building program and equipment	Experience in forest and land fire control	Beneficiaries/ participatory project monitoring
Fire Care Community ( <i>Masyarakat Peduli Api</i> )	Involved in forest and land fire control activities (voluntary group)	Low income, need capacity building and assistance	Willingness to involve in forest and land fire prevention	Beneficiaries/ participatory project monitoring
Indigenous community	Involved in land preparation and depends on natural resources	Ecosystem services threatened	Ancestral knowledge	Beneficiaries/ participatory project monitoring
Farmers	Use of agricultural lands	Loss of soil fertility	Local knowledge	Beneficiaries/ participatory project monitoring
<i>Secondary stakeholders</i>				
Central Government	Central government that are involved in prevention and response to forest fire incidents	Lack of coordination	Many agencies have concern in forest and land fire control activities	Participation in prevention activities and capacity building
Local government	Local authorities that are involved/have responsibilities in the prevention and response to forest fire incidents	Lack of participation	Local knowledge and resources	Participation in prevention activities
Police	Local police in village level that are involved in forest and land fire control	Lack knowledge on forest and land fire control	Law enforcement	Involved in integrated prevention patrol

Stakeholder group	characteristics	Problems, need and interests	Strengths	Relationships with the project
	activities			
Army	Local army in village level that are involved in forest and land fire control activities	Lack knowledge on forest and land fire control	Law enforcement	Involved in integrated prevention patrol
NGOs	Private non-profit organizations that provide support for the sustainable development of natural resources	Lack of coordination	Experience in local community assistance.	Sharing of information
Private sectors	Owner of concession areas	Fires threat their concession area	Resources	Participation in prevention activities
Plantation firms	Use of land for plantation	Loss of soil fertility	Resources	Participation in prevention activities

### 2.1.3 Problem analysis

Integrated prevention patrol, as has been stated in Part 1 of this Project Proposal, is a new program that has been implemented at the village/ground level since 2016 until now at almost all Local Fire Center (*Daops*) in Sumatera, Kalimantan and Sulawesi, particularly during dry/fire season. Each team of Integrated Prevention Patrol establishes a Village Command Post to support the prevention activities. Each Village Command Post can cover 3-5 villages. The team conducts prevention patrol, campaign, socialisation, coordination with local stakeholders, as well as measuring water level in peatland area, immediate fire suppression and report events to higher hierarchy. So far, it has identified some 4,140 fire prone villages. However, the limited national budget allows integrated prevention patrol only in 440 fire prone villages in 2020.

Integrated Prevention Patrol is one of the real activities in the field to prevent fire incident and it is necessary to be carried out since the early stage of the fire flare from field/site level can be identified. Fire prevention is a key activity stated in MoEF Planning Document (Renstra and Renja 2020-2024) and in line with President Directives No. 3 year 2020. Insufficient budget allocation for carrying out the activity has prevented the achievement of fire prevention targets. In light of the importance in tackling the issues, the project will improve technology/system and development of technique and guidelines such as SMART (Spatial Monitoring and Reporting Tool), an application tool that can be utilized for managing an integrated real time report by Manggala Agni in the field and works as preventive measures in protecting the forest from fire and haze in target location.

Based on Indonesia regulations, the coordination mechanism in forest fire prevention shall be conducted at various levels, namely: central, provincial, district/city, and the forest management unit. At central level, several ministries and national agencies have established coordination mechanisms which include, among others, the MoEF; Ministry of Agrarian Affairs; Spatial Planning/National Land Agency; Ministry of Health; National Institute of Aeronautics and Spaces (LAPAN); Meteorological, Climatological and Geophysical Agency (BMKG); and Geospatial Information Agency (BIG). At operational level (provincial and below), there is room for improvement, including coordination among actors i.e. these are all important efforts towards a common goal. However, at operational level, despite increased cooperation among local governments, law enforcement units, communities and the private sector, more needs to be done.

Based on the several studies and experiences, forest and land fires in Indonesia have negative impacts to health, ecosystems, economy, transportations, politics, etc.; loss of forest cover and natural wildlife habitats and damages to forest and land including peatland ecosystems. A key problem is to address repeated-occurrences of forest and land fire especially in the dry season. The direct and indirect causes of the key problem identified by the stakeholder meeting are highlighted below (see Problem Tree):

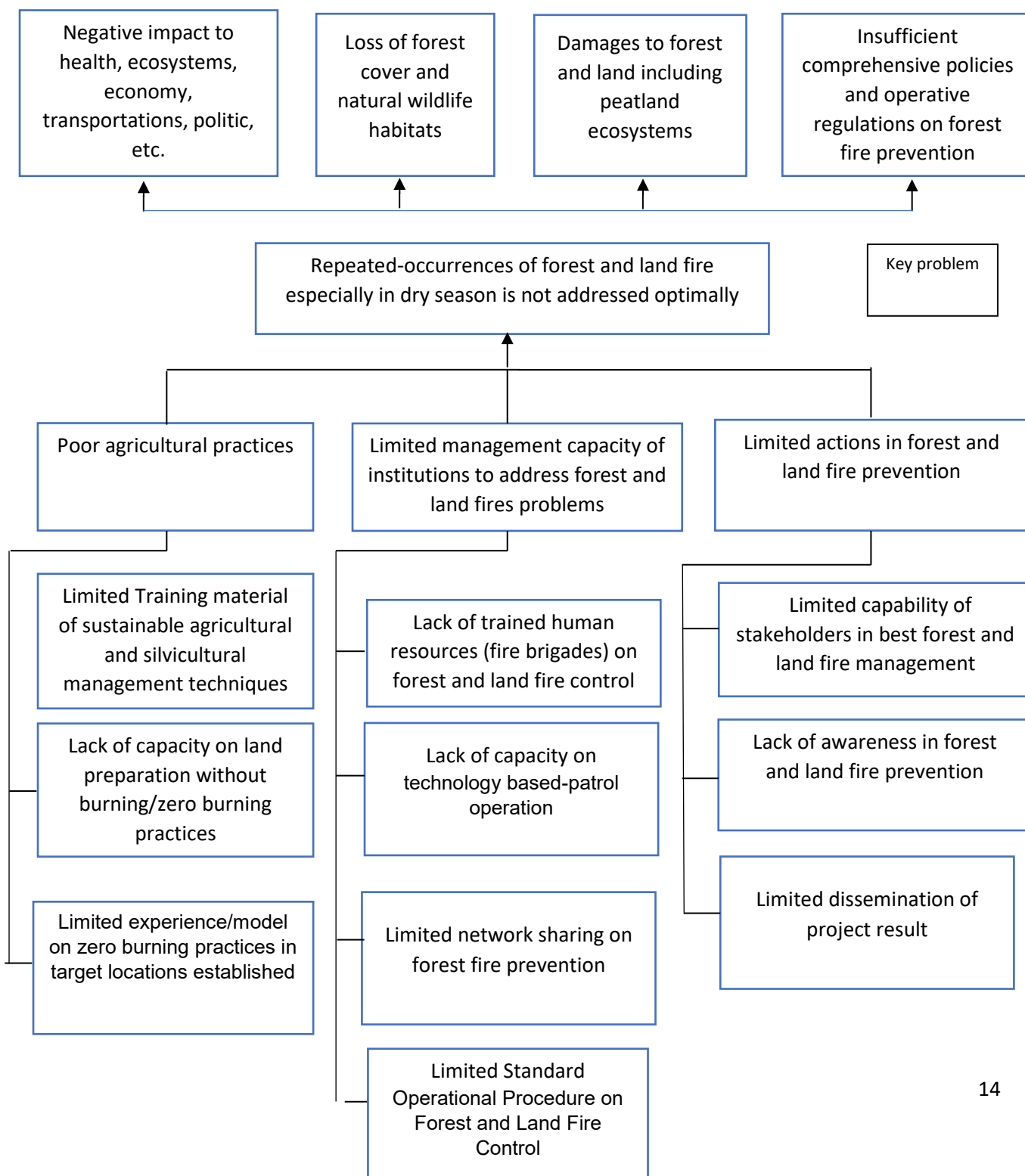
- Negative impact to health, ecosystems, economy, transportations, politic, etc.
- Loss of forest cover and natural wildlife habitats

- Damage to forest and land including peatland ecosystems
- Insufficient comprehensive policies and operative regulations on forest and land fire prevention

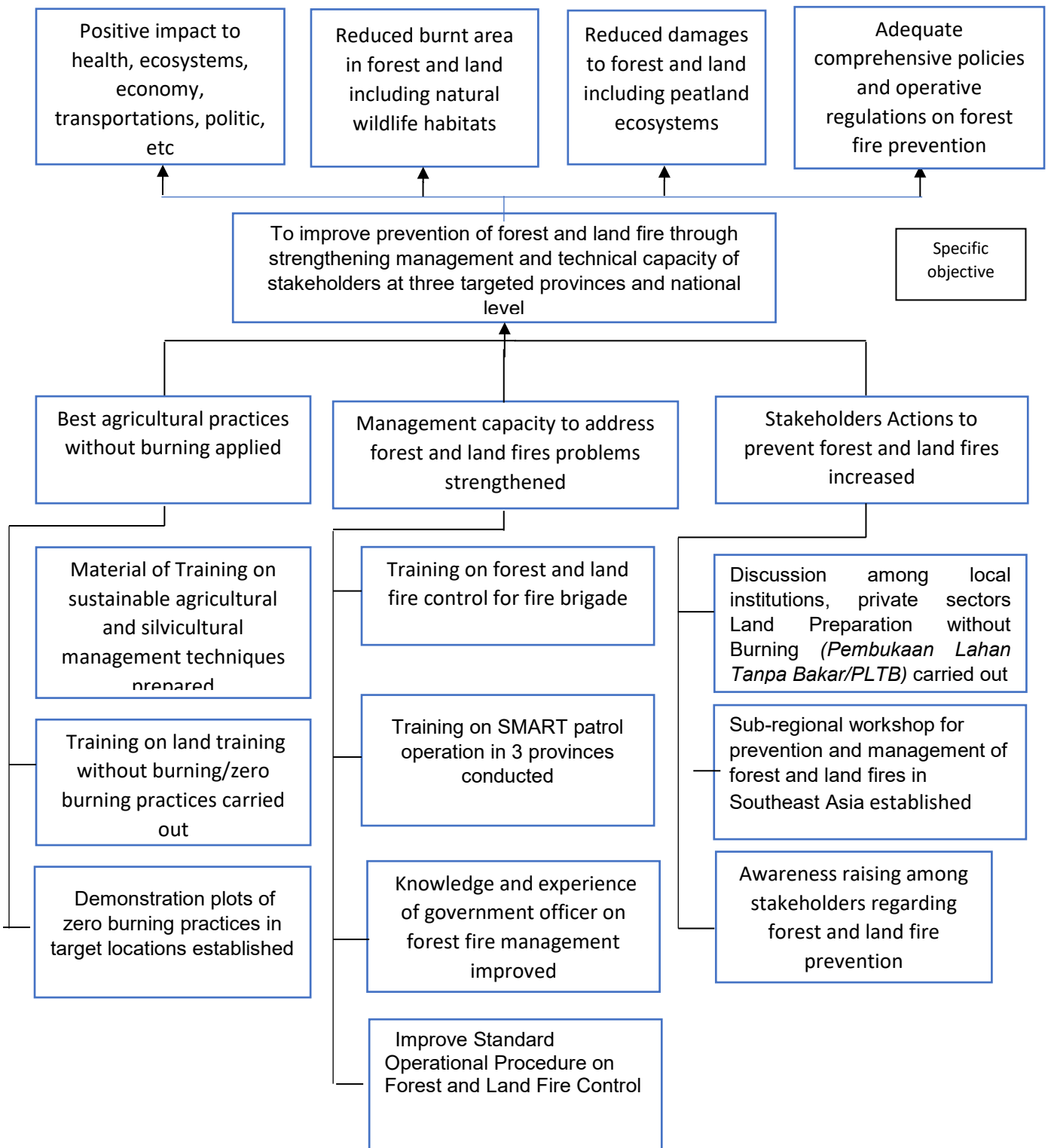
Following the stakeholder consultations, three main causes of the key problems had been identified, namely: i) Poor agricultural practices conducted by communities;2) Limited management capacity of institutions to address forest and land fires problems;3) Lack of cooperation/actions among stakeholders in forest and land fire prevention

The relationships between the causes of the main problems identified are summarized in Figure 1. The relevant and effective interventions should be derived from the Problem Tree by inverting it to become a Objectives Tree, as shown in Figure 2, is to be used as the basis for defining the relevant project interventions.

**Figure 1 Problem tree**



**Figure 2 Objectives Tree**



## 2.1.4 Logical framework

Intervention strategy	Measurable indicators	Means of verification	Assumption
<p>Development Objective:</p> <p>Support the capacity building for the implementation of integrated forest fire prevention program and reduce the effects of fires on forest cover, natural wildlife habitats and livelihood.</p>	<ul style="list-style-type: none"> <li>• forest burnt area reduce 10% from 2019</li> <li>• hotspot in target area reduce 10 % from 2019</li> <li>• number of manggala agni or community having accident with forest fire decreases up to 90 %</li> </ul>	<ul style="list-style-type: none"> <li>• National report of forest and land fire in Indonesia (LKj)/ statistics book</li> <li>• Annual Hotspot Information</li> </ul>	<ul style="list-style-type: none"> <li>• Stakeholders supported on addressing forest and land fire in Indonesia</li> <li>• Forest and Land Fire Prevention is National priority programme</li> </ul>
<p>Specific Objective :</p> <p>To improve prevention of forest and land fire through strengthening management and technical capacity of stakeholders at three targeted provinces and national level in <del>South Sumatera, Central Kalimantan, South Kalimantan, and Jakarta, Indonesia.</del></p>	<ul style="list-style-type: none"> <li>• Community in 8 villages in 3 provinces apply best practice agriculture (land preparation without burning).</li> <li>• Capacity of Forest and Land Fire Brigade (<i>Manggala Agni</i>) &amp; officials in 3 provinces improved.</li> <li>• Proven technology on reporting and detection of forest fires and forest burnt area to support Monitoring System available</li> <li>• Personal protective clothing properties and safety equipment of Manggala Agni in target location available</li> <li>• Main stakeholder awareness in three provinces on forest fire prevention improved</li> </ul>	<ul style="list-style-type: none"> <li>• Regional Report of Forest and Land fire</li> <li>• Data and statistics book</li> <li>• Progress report</li> <li>• Training report</li> <li>• Report of stakeholder coordination</li> <li>• Monitoring and Evaluation Report</li> </ul>	<ul style="list-style-type: none"> <li>• All stakeholders committed to handle Forest and Land fire</li> </ul>
<p>Output 1</p> <p>Best agricultural practices applied by Fire Care Community (MPA)/Local communities.</p>	<ul style="list-style-type: none"> <li>• One package of Development/improvement on sustainable agricultural and silvicultural management techniques as well as development of zero burning practices area</li> </ul>	<ul style="list-style-type: none"> <li>• Training reports</li> <li>• Training Material</li> </ul>	<ul style="list-style-type: none"> <li>• Community is committed to forest and land fire prevention programme</li> <li>• Fire Care Community members could be an agent of change to their neighborhood and promote zero burning activities.</li> </ul>



Intervention strategy	Measurable indicators	Means of verification	Assumption
	<p>available</p> <ul style="list-style-type: none"> <li>• Eight training programmes for local communities especially Fire Care Community (<i>Masyarakat Peduli Api/ MPA</i>) members in 3 provinces namely South Sumatera, Central Kalimantan and South Kalimantan conducted.</li> <li>• Demonstration plots of zero burning practices in 8 locations established</li> </ul>		
<p>Output 2</p> <p>Management capacity to address forest and land fires problems strengthened.</p>	<ul style="list-style-type: none"> <li>• Four training programmes on forest and land fire control conducted for Forest and Land Fire Brigade (<i>Manggala Agni</i>) in 3 provinces namely South Sumatera, Central Kalimantan and South Kalimantan.</li> <li>• Series of training for officials on GIS modeling carried out and proven remote sensing technology developed</li> <li>• One set technology/system of SMART integrated patrol reporting application developed and installed in 3 target provinces</li> <li>• One Standard Operational Procedure on Forest and Land Fire Control developed</li> <li>• Personal protective clothing properties and safety equipment of <i>Manggala Agni</i> in target location available</li> </ul>	<ul style="list-style-type: none"> <li>• Training reports</li> <li>• Short course report</li> <li>• Activity Report</li> <li>• Guideline/SOP</li> <li>• Procurement report</li> </ul>	<ul style="list-style-type: none"> <li>• Knowledge of <i>Manggala Agni</i> in forest and land fire response in the field will increase and it will help to reduce the incidence of forest and land fires.</li> <li>• Capability of government officials in forest and land fire management will increase and contribute to effective and efficient forest and land fire management performances.</li> <li>• Performance on forest and land fire control will increase through proper activities based on SOP/guidelines.</li> </ul>

Intervention strategy	Measurable indicators	Means of verification	Assumption
Output 3 Forest and land fire prevention action increased	<ul style="list-style-type: none"> <li>MOU among stakeholders (task force) to exchange information, conduct policy dialogues, strengthen cooperation implemented</li> <li>Two dialogue series to support Land Preparation without Burning (<i>Pembukaan Lahan Tanpa Bakar/ PLTB</i>) with private sector and local institutions implemented</li> <li>A sub-regional workshop for prevention and management of forest and land fires in Southeast Asia with an emphasis to Indonesia conducted</li> <li>Dissemination of the outcomes of the project developed in various forms such as leaflets, film and report/social media</li> </ul>	<ul style="list-style-type: none"> <li>Activity report</li> <li>Dialogues report</li> <li>Workshop report</li> <li>Documentation</li> </ul>	<ul style="list-style-type: none"> <li>local institutions and other stakeholders are interested to join the integrated prevention patrol activities.</li> <li>All stakeholders have awareness to prevent forest and land fire</li> </ul>

## 2.2. Objectives and indicator

### 2.2.1 Development objective and impact indicators

**Support the capacity building for the implementation of integrated forest and land fire prevention program and reduce the effects of the fires on the forest cover, natural wildlife habitats and livelihood.**

Impact Indicators:

- forest burnt area reduce 10% from 2019
- hotspot in target area reduce 10 % from 2019
- number of manggala agni or community having accidents with forest fire decreases up to 90 %

### 2.2.2 Specific objective and outcome indicators

**To improve prevention of forest and land fire through strengthening management and technical capacity of stakeholders at three targeted provinces of South Sumatera, Central Kalimantan and South Kalimantan, and national level**

Outcome indicators:

- Communities in 8 villages in 3 provinces apply best practice agriculture (land preparation without burning).
- Capacity of Forest and Land Fire Brigade (Manggala Agni) in 3 provinces and officials improved.

- Proven technology on reporting and detection of forest fires and forest burnt area to support Monitoring System available
- Personal protective clothing properties and safety equipment of Manggala Agni in target location available
- Main stakeholder awareness in three provinces on forest and land fire prevention improved

### **PART 3: DESCRIPTION OF PROJECT INTERVENTIONS**

#### **3.1. Outputs and activities**

##### **3.1.1 Outputs**

**Output 1:** Best agricultural practices applied by Fire Care Community (MPA)/Local communities.

##### Indicator Output 1:

- One package of Development/improvement on sustainable agricultural and silvicultural management techniques as well as the development of zero burning practices area available
- Eight training programmes for local communities especially Fire Care Community (*Masyarakat Peduli Api/MPA*) members in three provinces namely South Sumatera, Central Kalimantan and South Kalimantan conducted.
- Demonstration plots of zero burning practices in 8 locations established

**Output 2:** Management capacity to address forest and land fires problems strengthened.

##### Indicator Output 2:

- Four training programmes on forest and land fire control conducted for Forest and Land Fire Brigade (Manggala Agni) in three provinces namely South Sumatera, Central Kalimantan and South Kalimantan.
- Series of training for officials on GIS modeling carried out and proven and robust remote sensing technology developed
- One set technology/system of SMART integrated patrol reporting application developed and installed in 3 target provinces
- One Standard Operational Procedure on Forest and Land Fire Control developed
- Personal protective clothing properties and safety equipment of Manggala Agni in target location available

**Output 3:** Cooperation among local institution, private sector and communities for forest and land fire prevention strengthened.

##### Indicator Output 3:

- MOU among stakeholders (task force) to exchange information, conduct policy dialogues, strengthen cooperation implemented
- Two dialogue series to support Land Preparation without Burning (*Pembukaan Lahan Tanpa Bakar/PLTB*) with private sector and local institutions implemented
- A sub-regional workshop for prevention and management of forest and land fires in Southeast Asia with an emphasis on Indonesia conducted
- Dissemination of the outcomes of the project developed in various forms such as leaflets, film and report/media social.

##### 3.1.2 Activities

##### **Output 1:**

**Activity 1.1.** To improve training materials on sustainable agricultural and silvicultural management techniques/ guidelines as well as development of zero burning practices

**Activity 1.2.** To implement training for local community especially Fire Care Community (*Masyarakat Peduli Api/MPA*) members

**Activity 1.3.** To establish demonstration plots of zero burning practices in 8 locations.

##### **Output 2:**

- Activity 2.1.** To provide training for forest and land fire control for Forest and Land Fire Brigade (Manggala Agni) at province and district level
- Activity 2.2** To support officials on forest fire damage estimation using GIS and remote sensing application
- Activity 2.3.** To develop technology/system of SMART integrated patrol-reporting application for early detection and warning of forest fires in the fields.
- Activity 2.4** To improve Standard Operational Procedure on Forest and Land Fire Control
- Activity 2.5.** To support building capacity of Forest and Fire Brigade (Manggala Agni) to control land and forest fire by providing safety equipment.

**Note:**

**Activity 2.2**

The number of hot spots is used as an indicator of the level of success in achieving forest fire prevention efforts. However, because hotspots are merely indicative of a fire, the indicator needs to be increased and supplemented with other indicators that are more evident in the field such as forest burnt area estimation. Remote sensing data can be used to estimate burn areas, detection and assessment. In addition, remotely sensed data will provide rapid, accurate and reliable information. However, capacity of officials in GIS modeling and remote sensing applications to provide calculation of the actual burnt area is still limited. In addition, provision of proven technology is also proposed to support this activity.

**Activity 2.3**

Currently MoEF is collaborating with the Department of Computer Science of Bogor Agriculture University (IPB University) with the assistance of the Ministry of Finance- (LPDP) in developing an integrated patrol reporting application. As an illustration, this application is expected to be able to replace or substitute reporting applications conducted by 34 Operation Area (*Daops*) throughout Indonesia through WhatsApp's, which is not database-based. The application will allow all daily reports to be automatically stored on the server and monitoring by managerial level through the website dashboard. However, this application still needs to be developed and tested/installed at field level.

**Activity 2.5**

Field checks on monitored hotspots and regular firefighting conducted by *Manggala Agni* team in the field require long periods of hard work and exposure to danger in very hot environments. Therefore, provision of appropriate personal protective clothing and safety equipment during firefighting operations are needed.

**Output 3 :**

- Activity 3.1.** "To improve and strengthen the institutional coordination of the Task Force for Control on Forest and Land Fire Management at the national and provincial/district level".
- Activity 3.2.** To hold dialogues on forest and land fire Management/action with private sector and other local institutions
- Activity 3.3.** To organize a sub-regional workshop for prevention and management of forest and land fires in Southeast Asia with an emphasis on Indonesia
- Activity 3.4.** To develop dissemination of the outcomes of the project and asses of its replication in other area

**Note:**

**Activity 3.1**

At the national level, there is a MoU between MOEF cq Direktorat of Land and Forest Fire Management with The National Institute of Aeronautics and Spaces (*LAPAN*), and Meteorological, Climatological and Geophysical Agency (*BMKG*) on the exchange of data for early warning system. Likewise, at the provincial level, Unit Managements of DG of Climate Change (*Balai PPIKLH*) shall coordinate with the local government/the Provincial Task Force (*Satgas*). At the district/city level, coordination for forest and land fires is carried out by the Head of Manggala Agni at the Regional Operations (*Daops*) level. Although the coordination mechanism has been developed, its implementation encounters lack of coordination and effective communications especially at the operational level, affecting action being taken to anticipate forest fires

**Activity 3.2**

Coordination on operational matters at provincial/district level with license's holders (forest logging permit holder, Area Borrowing Permit Holder Forest, Community Forest and village forest Permit Holder etc.) and other institution such as forest management unit (KPH) and unit management of Hutan raya in the context of fire suppression showed less than optimal. Thus, to manage fire, coordination among these stakeholders needs to be improved.

### 3.2. Work Plan

Outputs and activities		Responsibility party	Year 1			
			Quarter			
			1	2	3	4
<b>Output 1</b>	Best agricultural practices applied by Fire Care Community (MPA)/Local communities.	Project Management unit/expert/local government				
A.1.1	Development/improvement of training materials on sustainable agricultural and silvicultural management techniques as well as development zero burning practices	Project Management unit /Education and Training Forestry center (Pusdiklat)				
A.1.2	Implement of training for local community especially Fire Care Community ( <i>Masyarakat Peduli Api/MPA</i> ) members					
A.1.3	Establish demonstration plots of zero burning practices					
<b>Output 2</b>	Management capacity to address forest and land fires problems strengthened.	Project Management unit/consultant/MOEF				
A.2.1	To provide training for forest and land fire control for Forest and Land Brigade (Manggala Agni) at province and district level					
A.2.2	To support officials on forest fire damage estimation using GIS and remote sensing application					
A.2.3	To develop technology/system of SMART integrated patrol-reporting application.					
A.2.4	To improve Standard Operational Procedure on Forest and Land Fire Control	Project Management unit /Education and Training Forestry center ( <i>Pusdiklat</i> )				
A.2.5	To support building capacity of Forest and Fire Brigade (Manggala Agni) to control land and forest fire by providing safety equipment					
<b>Output 3</b>	Forest and Land fire prevention action increased	Project Management unit/consultant/MOEF				
A.3.1	To improve and strengthen the institutional coordination of the Task Force for Control on Forest and Land Fire Management at the					

Outputs and activities		Responsibility party	Year 1			
			Quarter			
			1	2	3	4
	national and provincial/district level					
A.3.2	To hold dialogues on forest and land fire Management/action with private sectors and other local institutions					
A.3.3	Organize a sub-regional workshop for prevention and management of forest and land fires in Southeast Asia with an emphasis to Indonesia	Sub-contract to third party				
A.3.4	Develop dissemination of the outcomes of the project and asses of its replication in other area					
Reporting						

### 3.3 Implementation approaches and methods

The specific objective of the project will be achieved by delivering the three outputs outlined. Under the defined individual outputs, sufficient and relevant activities have been identified; these activities will be implemented through technology improvement and guidelines development in the following fashion:

#### Output 1.

Conduct capacity building on grass root level through implementing training programs for local communities especially Fire Care Community (*Masyarakat Peduli Api/MPA*) members in the three targeted provinces. Developing 70 command posts in total for conducting integrated prevention patrol activities in the three targeted provinces and establishing demonstration plots for zero burning practices in 8 locations.

#### Output 2.

It will be achieved by carrying out training programs on forest and land fire control for Forest and Land Fire Brigade (*Manggala Agni*) in three targeted provinces as well as conducting training and operation of SMART patrol. To improve and exchange experience on forest fire management, decision makers at national and provincial levels will participate in selected international forest fire meetings. Improving standard operational procedure on forest and land fire control will also be undertaken.

SMART (Spatial Monitoring and Reporting Tool) is an application tool that can be utilized for managing an integrated real time database by forest rangers in the field. This system is connected to smartphones so that it can be effectively used in managing data from the field. Training modules will cover learning. The SMART patrol training proposed by the project is training on the application of the database management system using the SMART application for forest patrolling for the forest fire prevention. Moreover, through collaboration between Forest Fire Brigade (*Manggala Agni*) and Fire Care Community (*Masyarakat Peduli Api*), SMART patrols will be conducted as a preventive measure on forest fires and haze in target location.

#### Output 3.

This output will be delivered through the development of a coordination system among stakeholders which is of importance to enhance information sharing and take rapid-fire suppression actions. Coordination meetings will be effectively organized to support actions on land preparation without burning (*Pembukaan Lahan Tanpa Bakar/PLTB*) which will be conducted by stakeholders, mainly communities and private sectors. The project will also hold a sub-regional workshop for prevention and management of forest and land fires in Southeast Asia. Selected international experts on forest fire issues will be invited. This knowledge and information sharing are important elements for disseminating the results/outputs of the project. This sub-regional workshop will be organized in cooperation with IPB University. It is also important to disseminate the

outcomes of the project in various forms of project promotional materials such as leaflets, videos, and report using different available platforms, including social media.

### 3.4. Project Budget

#### 3.4.1. Master Budget (USD)

See attachment

#### 3.4.2 Consolidated Yearly Budget

Category	Description	Total	Year 1			
			Q1	Q2	Q3	Q4
<b>10</b>	<b>Personnel</b>					
11	Project Coordinator	27,000.00	4,500.00	4,500.00	9,000.00	9,000.00
12	Project Treasurer	18,000.00	3,000.00	3,000.00	6,000.00	6,000.00
13	Expert	8,000.00	6,000.00	2,000.00	-	-
14	Facilitator	74,700.00	24,300.00	16,800.00	16,800.00	16,800.00
<b>19</b>	<b>Sub total</b>	<b>127,700.00</b>	<b>37,800.00</b>	<b>26,300.00</b>	<b>31,800.00</b>	<b>31,800.00</b>
<b>20</b>	<b>Sub contracts</b>					
21	Sub Contract A (Advance Monitoring System)	80,000.00	20,000.00	20,000.00	20,000.00	20,000.00
22	Sub contract B (Regional Workshop South East ASIA)	50,000.00	-	-	-	50,000.00
<b>29</b>	<b>Sub total</b>	<b>130,000.00</b>	<b>20,000.00</b>	<b>20,000.00</b>	<b>20,000.00</b>	<b>70,000.00</b>
<b>30</b>	<b>Duty Travel</b>					
31	Daily Subsistance Allowance	-	-	-	-	-
	31.1. DSA International	6,000.00	-	6,000.00	-	-
	31.2. DSA	81,400.00	23,700.00	18,680.00	19,510.00	19,510.00
32	Air ticket	-	-	-	-	-
	32.1. Air ticket International	3,000.00	-	3,000.00	-	-
	32.2. Air ticket domestic	31,500.00	8,550.00	6,750.00	8,100.00	8,100.00
33	Local Transport	12,400.00	3,500.00	2,900.00	3,000.00	3,000.00
<b>39</b>	<b>Sub total</b>	<b>134,300.00</b>	<b>35,750.00</b>	<b>37,330.00</b>	<b>30,610.00</b>	<b>30,610.00</b>
<b>40</b>	<b>Capital Items</b>					
41	Laptop, PC (Printer)	10,000.00	10,000.00	-	-	-
42	FireFighter Coat	120,000.00	-	120,000.00	-	-
44	Motorcycle	14,100.00	-	14,100.00	-	-
45	Vehicle	33,000.00	-	33,000.00	-	-
46	waterpump	32,000.00	-	32,000.00	-	-
47	GPS	3,600.00	-	3,600.00	-	-
48	Remote Sensing	14,300.00	-	14,300.00	-	-
49	Sattelite Phone		39,600.00			

Category	Description	Total	Year 1			
			Q1	Q2	Q3	Q4
		39,600.00		-	-	
<b>49</b>	<b>Sub total</b>	<b>266,600.00</b>	<b>49,600.00</b>	<b>217,000.00</b>		-
<b>50</b>	<b>Consumables items</b>					
51	Office supplies	14,300.00	2,600.00	2,600.00	4,550.00	4,550.00
52	Training Equipment	27,000.00	6,750.00	6,750.00	6,750.00	6,750.00
53	Develop training material	49,000.00	13,000.00	12,000.00	12,000.00	12,000.00
54	Produce leaflet	14,000.00	-	7,000.00	-	7,000.00
55	Office Space	5,000.00	1,250.00	1,250.00	1,250.00	1,250.00
56	Safety shoes	60,000.00	-	60,000.00	-	-
<b>59</b>	<b>Sub total</b>	<b>169,300.00</b>	<b>23,600.00</b>	<b>89,600.00</b>	<b>24,550.00</b>	<b>31,550.00</b>
<b>60</b>	<b>Miscellaneous</b>					
61	Training / course	40,000.00	10,000.00	10,000.00	10,000.00	10,000.00
62	Miscellaneous	5,250.00	1,750.00	1,000.00	1,000.00	1,500.00
63	Workshop / FGD	84,000.00	14,000.00	14,000.00	28,000.00	28,000.00
64	Publication	1,092.16	-	-	1,092.16	-
65	PSC/PTC Meeting	6,000.00	3,000.00	-	3,000.00	-
66	Financial Audit	10,000.00	2,000.00	2,000.00	4,000.00	2,000.00
67	Meeting	4,000.00	3,000.00	1,000.00	-	-
<b>69</b>	<b>Sub total</b>	<b>150,342.16</b>	<b>33,750.00</b>	<b>28,000.00</b>	<b>47,092.16</b>	<b>41,500.00</b>
<b>70</b>	<b>Total Project</b>	<b>978,242.16</b>	<b>200,500.00</b>	<b>418,230.00</b>	<b>154,052.16</b>	<b>205,460.00</b>
<b>80</b>	<b>National management cost</b>	-	(See executing agency budget)			
<b>90</b>	Project monitoring and administration					
91	ITTO monitoring & review	25,000.00				
92	ITTO final evaluation	10,000.00				
95	ITTO Programme support (70 + 91 +92) x 12%	118,421.00				
<b>100</b>	<b>Total Project Monitoring and Administration</b>	153,421.00				
	<b>GRAND TOTAL (70 + 100)</b>	<b>1,131,663.16</b>				



### 3.4.3. ITTO Yearly Budget

Category	Description	Total	Year 1			
			Q1	Q2	Q3	Q4
<b>10</b>	<b>Personnel</b>					
11	Project Coordinator	27,000.00	4,500.00	4,500.00	9,000.00	9,000.00
12	Project Treasurer	18,000.00	3,000.00	3,000.00	6,000.00	6,000.00
13	Expert	8,000.00	6,000.00	2,000.00	-	-
14	Facilitator	74,700.00	24,300.00	16,800.00	16,800.00	16,800.00
<b>19</b>	<b>Sub total</b>	<b>127,700.00</b>	<b>37,800.00</b>	<b>26,300.00</b>	<b>31,800.00</b>	<b>31,800.00</b>
<b>20</b>	<b>Sub contracts</b>					
21	Sub Contract A (Advance Monitoring System)	80,000.00	20,000.00	20,000.00	20,000.00	20,000.00
22	Sub contract B (Regional Workhop South East ASIA)	50,000.00	-	-	-	50,000.00
<b>29</b>	<b>Sub total</b>	<b>130,000.00</b>	<b>20,000.00</b>	<b>20,000.00</b>	<b>20,000.00</b>	<b>70,000.00</b>
<b>30</b>	<b>Duty Travel</b>					
31	Daily Subsistance Allowance	-	-	-	-	-
	31.1. DSA International	6,000.00	-	6,000.00	-	-
	31.2. DSA	74,800.00	22,050.00	17,030.00	17,860.00	17,860.00
32	Air ticket	-	-	-	-	-
	32.1. Air ticket International	3,000.00	-	3,000.00	-	-
	32.2. Air ticket domestic	27,900.00	7,650.00	5,850.00	7,200.00	7,200.00
33	Local Transport	10,800.00	3,100.00	2,500.00	2,600.00	2,600.00
<b>39</b>	<b>Sub total</b>	<b>122,500.00</b>	<b>32,800.00</b>	<b>34,380.00</b>	<b>27,660.00</b>	<b>27,660.00</b>
<b>40</b>	<b>Capital Items</b>					
41	Laptop, PC (Printer)	5,000.00	5,000.00	-	-	-
42	FireFighter Coat	120,000.00	-	120,000.00	-	-
44	Motorcycle	14,100.00	-	14,100.00	-	-
45	Vehicle	33,000.00	-	33,000.00	-	-
46	waterpump	32,000.00	-	32,000.00	-	-
47	GPS	3,600.00	-	3,600.00	-	-
48	Remote Sensing	14,300.00	-	14,300.00	-	-
49	Sattelite Phone	39,600.00	39,600.00	-	-	-
56	Safety Shoes	60,000.00	-	60,000.00	-	-
<b>49</b>	<b>Sub total</b>	<b>321,600.00</b>	<b>44,600.00</b>	<b>277,000.00</b>	-	-
<b>50</b>	<b>Consumables items</b>					
51	Office supplies	11,700.00	1,950.00	1,950.00	3,900.00	3,900.00
52	Training Equipment	27,000.00	6,750.00	6,750.00	6,750.00	6,750.00
53	Develop training material	49,000.00	13,000.00	12,000.00	12,000.00	12,000.00
54	Produce leaflet	14,000.00	-	7,000.00	-	7,000.00
55	Office Space	-	-	-	-	-
<b>59</b>	<b>Sub total</b>	<b>101,700.00</b>	<b>21,700.00</b>	<b>27,700.00</b>	<b>22,650.00</b>	<b>29,650.00</b>
<b>60</b>	<b>Miscellaneous</b>					
61	Training / cources	40,000.00	10,000.00	10,000.00	10,000.00	10,000.00
62	Miscelaneous	5,250.00	1,750.00	1,000.00	1,000.00	1,500.00
63	Workshop / FGD	84,000.00	14,000.00	14,000.00	28,000.00	28,000.00

Category	Description	Total	Year 1			
			Q1	Q2	Q3	Q4
64	Publication	1,092.16	-	-	1,092.16	-
65	PSC/PTC Meeting	4,000.00	2,000.00	-	2,000.00	-
66	Financial Audit	10,000.00	2,000.00	2,000.00	4,000.00	2,000.00
67	Meeting	4,000.00	3,000.00	1,000.00	-	-
<b>69</b>	<b>Sub total</b>	<b>148,342.16</b>	<b>32,750.00</b>	<b>28,000.00</b>	<b>46,092.16</b>	<b>41,500.00</b>
<b>70</b>	<b>Total Project</b>	<b>951,842.16</b>	<b>189,650.00</b>	<b>413,380.00</b>	<b>148,202.16</b>	<b>200,610.00</b>
<b>80</b>	<b>National management cost</b>	-	(See executing agency budget)			
<b>90</b>	Project monitoring and administration					
91	ITTO monitoring & review	25,000.00				
92	ITTO final evaluation	10,000.00				
95	ITTO Programme support (70 + 91 +92) x 12%	<b>118,421.00</b>				
<b>100</b>	<b>Total Project Monitoring and Administration</b>	<b>153,421.00</b>				
	<b>GRAND TOTAL (70 + 100)</b>	<b>1,105,263.16</b>				

### 3.4.4 Executing Agency Yearly Budget

Category	Description	Total	Year 1			Year 2
			Q2	Q3	Q4	Q1
10	Personnel					
19	Sub total	-	-	-	-	-
20	Sub contracts					
21	Sub contract No.					
29	Sub total	-	-	-	-	-
30	Duty Travel					
31	Daily Subsistence Allowance	6,600.00	1,650.00	1,650.00	1,650.00	1,650.00
32	Air ticket	3,600.00	900.00	900.00	900.00	900.00
33	Local Transport	1,600.00	400.00	400.00	400.00	400.00
39	Sub total	11,800.00	2,950.00	2,950.00	2,950.00	2,950.00
40	Capital Items					
41	Laptop, PC (Printer)	5,000.00	5,000.00	-	-	-
49	Sub total	5,000.00	5,000.00	-	-	-
50	Consumables items					
51	Office supplies	2,600.00	650.00	650.00	650.00	650.00
55	Office Space	5,000.00	1,250.00	1,250.00	1,250.00	1,250.00
59	Sub total	7,600.00	1,900.00	1,900.00	1,900.00	1,900.00
60	Miscellaneous					
64	PSC/PTC Meeting	2,000.00	1,000.00	-	-	1,000.00
69	Sub total	2,000.00	1,000.00	-	-	1,000.00
70	Total Project	26,400.00	10,850.00	4,850.00	4,850.00	5,850.00
80	National management cost	-	(See executing agency budget)			
90	Project monitoring and administration					
	<b>GRAND TOTAL (70 + 100)</b>	<b>26,400.00</b>				

### 3.5. Assumptions, Risk and Sustainability

#### 3.5.1 Assumptions and Risks

For the project's successful implementation, it is assumed that:

- 1) The stakeholders will support the whole project's activities;
- 2) The central government will maintain forest fire prevention as its national priority programme; and
- 3) All stakeholders firmly commit to actively participate in actions to handle forest and land fire in the country.

Some of the risks that could obstruct the achievement of project outputs and the project's development as well as the specific objectives include:

- 1) Stakeholders do not fully support addressing forest and land fire problems in Indonesia.
- 2) Forest and land fire prevention is not maintained as a national priority program.
- 3) All stakeholders do not commit to handle forest and land fire problems.

In order to mitigate or reduce these above risks, the project will carry out activities in intensive coordination and cooperation with all stakeholders and in line with the Minister of Environment and Forestry Regulation No P.32/2016 on Forest and Land Fires Control which aims to increase stakeholders' participation in forest and land fire control including prevention, suppression, and post-fire activities. Furthermore, the related stakeholders in local, district, provincial, national or even regional levels will be invited to attend meetings, training or events that could increase their awareness and participation in addressing forest and land fire

issues. The regional office will be in continuous and direct contact with local communities and representatives of related stakeholders to build networking and conduct intensive communication as well as participation in project events.

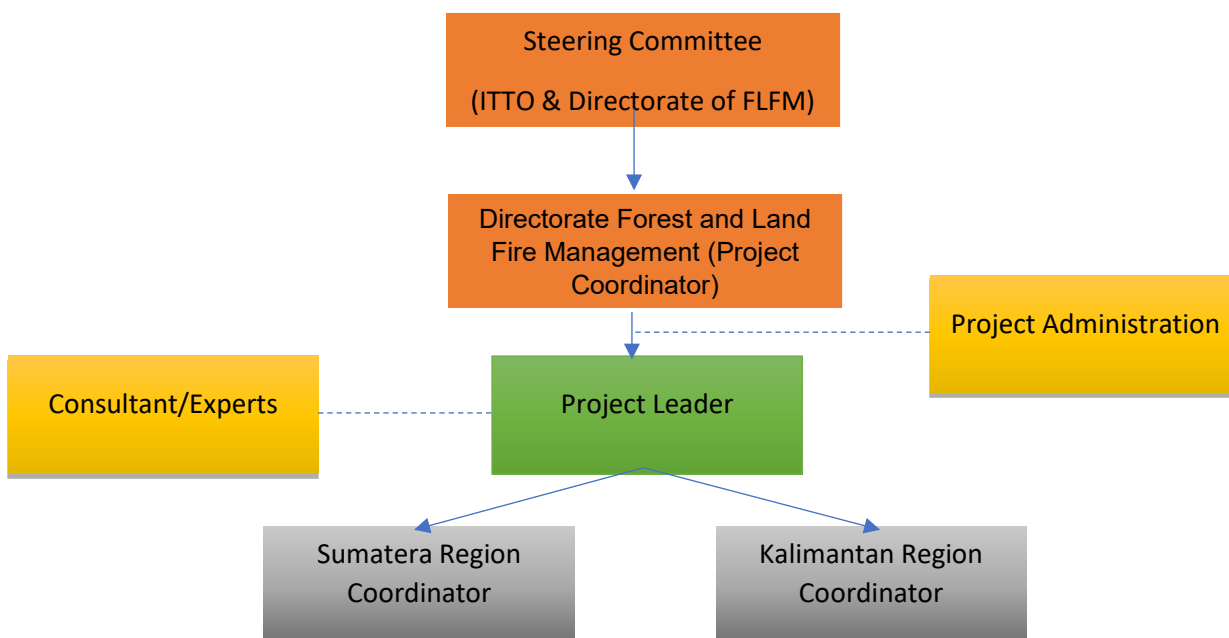
### 3.5.2 Sustainability

- The development of this project is part of the activities of the Directorate of Forest and Land Fire Management. Therefore, technically, the activities will be continuously conducted after project completion.
- The Directorate of Forest and Land Fire Management, MoEF will allocate national budget to conduct forest and land fire prevention activities.
- Indonesia has some regulations on forest and land fire control. This means that the sustainability of the activities will be supported both institutionally and politically.
- Participation of Fire Care Community and other local communities as well as local stakeholders in this project through best agricultural practices is aimed to create social and economic sustainability, so that the forest and land fire prevention activities could be continuously conducted.

## PART 4: IMPLEMENTATION ARRANGEMENTS

### 4.1. Organization structure and Stakeholder involvement mechanisms

#### 4.1.1 Executing agency and partners



#### 4.1.2 Project management team

The project management team will comprise the following:

- A project coordinator (Directorate of Forest and Land Fire Management)
- A project leader
- Two regional office coordinators (Regional Climate Change and Forest and Land Fire Agency)
- Two regional office assistants

#### 4.1.3 Project steering committee

The membership of the project steering committee will be as follows:

- A representative of Directorate of Forest and Land Fire Management
- A representative of ITTO

- Regional Climate Change and Land and Forest Fire Agency of Sumatera
- Regional Climate Change and Land and Forest Fire Agency of Kalimantan

#### **4.1.4 Stakeholder involvement mechanisms**

The executing agency will establish a Consultative Committee. This committee will provide a platform for the sharing of views among stakeholders/beneficiaries and will offer feedback for the improvement of project implementation

#### **4.2. Reporting, review, monitoring and evaluation**

The following reports will be prepared and submitted:

- Inception report – upon project approval
- Work plan – together with the inception report
- Six-monthly progress reports including technical report– by 31 Oct and/or 4 weeks before the arrival of a review and monitoring mission
- Annual and final financial reports
- Completion report – upon project completion

In addition, the project will be monitored according to ITTO's guidelines for monitoring and evaluation of projects."

Key personnel of the project will visit Japan to brief the progress of the project to ITTC and the donor.

### **4.3 Dissemination and mainstreaming of project learning**

#### **4.3.1 Dissemination of project results**

Project learning and results will be disseminated through various means and channels during the implementation phase and after project completion. It will be disseminated through various strategies such as consultations/dialogues, documents, talk shows and articles in local newspapers; The results report produced bilingually (English and Bahasa Indonesia) will be disseminated to relevant institutions and stakeholders such as buyers, local governments, wood industries and other networks particularly in Indonesia. The project management team will build a project website to post project progress reports and to obtain feedback. It will publish and post the proceedings of the various workshop and associated documentation on the website of MoEF and local government.

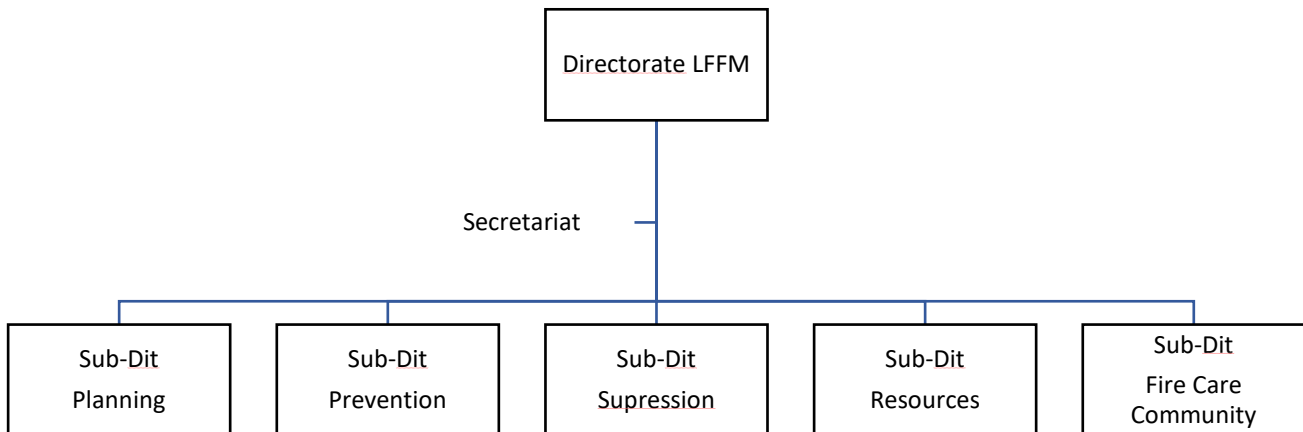
#### **4.3.2 Mainstreaming project learning**

The results of this project will benefit the various government levels and related agencies in Indonesia, in providing timely information to support decision-making on forest and land fire management. Local communities and several government staff at province and district level will have been trained on forest and land fire prevention. They are expected to play a key role in mainstreaming the lessons learned and experiences within the relevant agencies. All information /result /experiences will be documented in the database system. The website will be accessible by decision makers and other stakeholders. Lessons learned from improvement and implementation of integrated forest fire prevention through effective coordination mechanism will be useful for mainstreaming national policies in forest and land fire prevention in Indonesia, even other Asian countries.

## ANNEX 1 PROFILES OF THE EXECUTING AGENCY

### BACKGROUND

The Directorate of Forest and Land Fire Management, Directorate General of Climate Change, Ministry of Environment and Forestry, Republic of Indonesia is responsible for forest and land fire management that covers prevention, suppression, post fire activity and has functions in providing regulations, services and controls for all aspects related to forest and land fire. It consists of five sub-directorates and one secretariat of the Directorate. The Organization Structure of Directorate of Land and Forest Fire Management as follows:



The Directorate's main task is to provide rules and regulations, policy, planning, operational standard and technical assistance for the management and development of forest and land fire. Executing Agency for this Project is under the responsibility of the Directorate of Land and Forest Fire Management.

### BUDGET

Within the last three years, the budget of the Directorate of Land and Forest Fire Management is 6 million USD per year.

### PERSONNEL

The personnel within the Directorate of Land and Forest Fire Management is consist of post graduated, graduated and middle-level technical degrees.

## ANNEX 2 TERMS OF REFERENCE OF PERSONEL AND CONSULTANTS AND SUB-CONTRACTS FUNDED BY ITTO

### I. Terms of Reference for Project Coordinator

Position: Project coordinator; one project coordinator will be hired to run the project and to coordinate operational activities.

Duration: 12 months

Responsibility: Project coordinator will be responsible for coordinating and supervising all activities and ensuring that the overall objectives are achieved under the coordination of the steering committee and in close cooperation with other members of the project staff. He or she will work closely with all parties and personnel involved in the project and be responsible for the day-to-day management of the project. He or she will integrate all activities of project management and be responsible of funds applied to the project and for the preparation of all project reports.

Qualification, experience and payment: He or she must have good understanding of the overall project objectives, output to be achieved and activities to be carried out of the project. He or she must have sufficient experience in working on integrated forest and land fire prevention, forest and land fire management as general field and have high communication and linguistically ability.

### II. Project Administrative/finance staffs

Duration: 12 months

Responsibility: Project Financial/Secretary helps the Project coordinator on financial and administrative matters.

### III. National Consultants/Experts, Trainers and Sub-contracts

<u>Position</u>	<u>Main task</u>	<u>Qualification</u>
Expert/consultant Activity 1 .1 :To Development / improvement of training materials on sustainable agricultural and silvicultural management techniques/guidelines as well as development zero burning practices	<ul style="list-style-type: none"> <li>To improve training material/guidelines on agricultural and silvicultural management techniques/guidelines as well as development of zero burning practices</li> <li>To present the report to Project Executing agency</li> </ul>	Hold at least Master's degree and 3-5 years' experience in developing training material on forest and land fire management and sustainable agricultural and forest management including (opening land without burnt) Good understanding in English both oral and written.
Expert/consultant Activity 2.4. :To improve Standard Operational Procedure on Forest and Land Fire Control	<ul style="list-style-type: none"> <li>To formulate Standard Operational Procedure on Forest and Land Fire Control</li> <li>To present the consultant report</li> </ul>	Hold at least Master's degree and 3-5 years' experience in forest and land fire management and related field. Good understanding in English both oral and written.
Expert/consultant For activity 3.4 To develop dissemination of the outcomes of the project and asses its replication in other areas	<ul style="list-style-type: none"> <li>To collect information and data</li> <li>To develop a strategy for dissemination of the outcomes of the</li> </ul>	Hold at least strata 1 degree and 3-5 years' experience in related fields such as communication strategy and familiar with forest and land

	project <ul style="list-style-type: none"> <li>To assess its replication in other area after project completion</li> </ul>	fire prevention in Indonesia, Good understanding in English both oral and written. Sufficient knowledge of the situation in target locations and Indonesia. The expert will carry out the activity within the time as allocated by the project.
<b>Sub Contract for</b> Activity 2.3. To develop technology/system of SMART integrated patrol reporting application	<ul style="list-style-type: none"> <li>To design technology/system</li> <li>To discuss with Executing Agency</li> <li>To install and test the system</li> <li>To develop report</li> </ul>	Sub Contract to University/NGO

**IV. Term of Reference for a sub-regional workshop for prevention and management of forest and land fires in Southeast Asia**

**Objective of the workshop** 1) to exchange information and experience in the forest fire prevention and management of forest and fires in South East Asia; and 2) Identify best strategies for prevention and management of forest and land fires; 3) Highlight major issues and challenges on forest fire prevention

**Participants :**

- Officials of the Ministry of Environment and Forestry, Provincial Government of West Kalimantan and District Government of target location
- Representatives of ITTO and Japan Government
- Officials from south Southeast Asian Countries
- Environmental NGOs, academes and researchers interested in forest fire prevention and management of land and fires
- Representatives of other initiatives such as JICA Project, USAID, etc
- Project consultants

Organizing of workshop will be sub-contracted to University/NGO. The responsibility of the organizer includes: 1) Preparation for the workshop; 2) organization of the workshop; 3) To produce a workshop report/proceeding.

More detailed TORs for consultants will be set up at the time of contracting them.