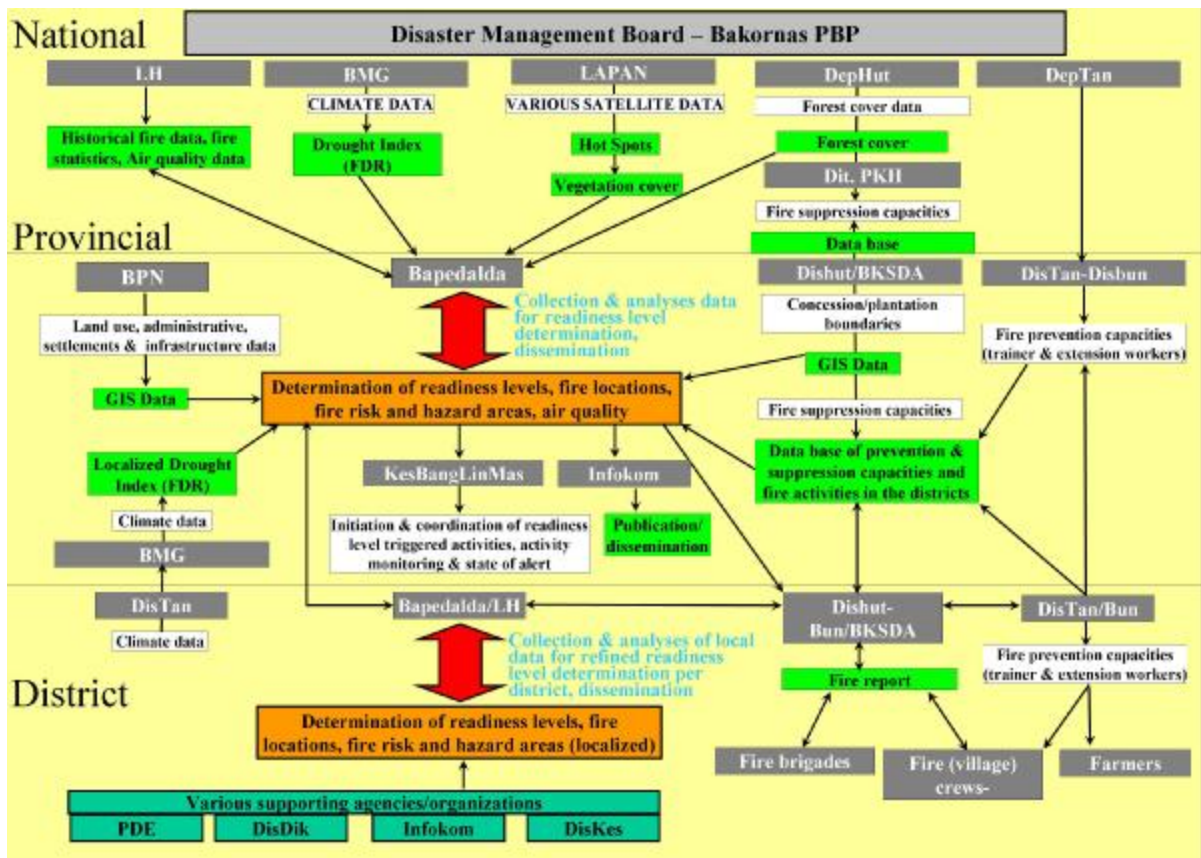




A Fire Information System for South Sumatra: Stakeholder Analysis and Draft concepts



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PREFACE

The South Sumatra Forest Fire Management Project (SSFFMP) is a technical co-operation project jointly funded, in terms of the financing memorandum IDN/RELEX/1999/0103, by the European Commission and by the Government of the Republic of Indonesia through the Ministry of Forestry (MoF).

This report has been completed in accordance with the project Overall Work Plan (OWP) and

in part fulfilment of Activity 4.2, “Support relevant agencies at the provincial level to improve the fire information distribution system.”

to achieve Result 4 “Government and NGO’s supported to establish systems to monitor the impact of improved fire management on the environment and people and the results of the work placed in the public domain.”

to realise the five-year project purpose, which is “Aid and facilitate the establishment of a coordinated system of fire management at province, district, sub district and village level throughout South Sumatra province in which all involved stakeholders, including the private sector, work together to reduce the negative impact of fire on the natural and social environment.”

This report has been prepared with financial assistance from the Commission of the European Communities. The opinions, views and recommendations expressed are those of the author and in no way reflect the official opinion of the Commission.

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EXECUTIVE SUMMARY

The fire situations in Indonesia over the last 7 years emphasize the necessity for an applied Fire Information System (FIS) to support efforts of fire management. Readily available and used fire information is the glue that underpins balanced fire management. Fire related information constantly collected and re-analysed as well as readily distributed is indispensable for all five fire management components and links them up in a continuous cycle. Information is closely linked to analysis and is even mutually supportive, since analysis is based on data and information and needs to be continuously conducted in order to support the other components of fire management. The objective of fire information is to provide compiled and analysed information necessary to trigger fire management activities as well as for decision-making, procedures and recommendations to all functions of fire management and to other stakeholders at all levels.

The South Sumatra Forest Fire Management Project attempts to develop and built a Fire Information System that is embedded into the appropriate institutional structures to support fire management efforts. The existing institutional structures as well as existing laws and regulation presently name the Ministry of Environment (monitoring, evaluation and policy) as the main agent for (management of) fire information under the coordination of the Natural Disaster Management Board. Support of resources and information shall be provided by other several agencies. In addition various elements of fire information are already available. However, in reality there is a lack of the systematic use and application of information and information sharing as well as application for decision making at the regional and/or local level.

Fire management tasks are not yet institutionalized in the respective land management agencies and co-ordination mechanisms that would link up national, provincial, district and local level are only rudimentarily in place. Thus even the application and implementation of existing information for decision making, regional planning or simply to trigger fire response activities is often hampered by the unclear tasks and roles of the governmental agencies. In the course of decentralisation the new (fire management) roles of the governmental agencies as civil servants at the regional/district level have yet to be learned and filled with partly new tasks, functions, and job descriptions. Decentralisation intensifies the need for capable staff (knowledge, skills, and competency) and increases the importance of capacity building at organisational (structures, procedures, decision making processes) and system level (legal framework, policies) especially at the provincial, district, and local level.

Currently, there is only one fire management organization operational at the provincial level in Indonesia that is operating on a fulltime basis carrying out the daily tasks of fire management. The “Unit Pelaksanaan Teknis Daerah” (UPTD) in East Kalimantan is under the responsibility of the provincial forestry department and



consists of three technical units, i.e. administration, fire operation and prevention, and fire information. The fire information unit not only gathers and produces information; it also analyses and applies the information in a standardized process by determining readiness levels to trigger the related fire management activities. It regularly distributes fire information to involved and interested stakeholders and receives fire reports about fire suppression activities from the local level. The example of East Kalimantan provides many aspects that can be adopted.

To strengthen the existing agencies and their role in fire management in South Sumatra, SSFFMP has started an iterative process to identify components and elements of a Fire Information System such as existing data/information, data provider, data analysts, end users, coordination, communication as well as reporting procedures and systems. During the mission a variety of multi-stakeholder and on-going public consultation processes, several workshops and meetings have been attended, organised and facilitated. Presentations have been given and various material provided about (existing) fire information and about the five main components of fire management. As a result first draft concepts of involvement and roles of organisations and agencies for fire information at provincial and district level have been designed.

The workshop results clearly show that there is the tendency mainly at the district level to involve too many players in fire information activities and assign duties to less relevant parties. They can hardly accomplish them nor do they comprehend it in the context of a functioning multi-agency fire management structure and the related activities. This is the consequence of a lack of understanding of fire management itself and its inherent tasks. Moreover, the results also show that the districts' civil service agencies have not yet fully understood their roles and functions, e.g. if the Nation Unity and Civil Protection agency is selected as the main agent for Fire Information System the coordination function for disaster management is misinterpreted. In addition, the role of the Environmental Agency is not recognised or not known especially at the district level. This demonstrates that at the district level there is lack of information and knowledge about the actual and current political and legal state of affairs in terms of fire management in particular but also in terms of roles and functions of the civil service agencies in general.

The governmental agencies for fire information require (long-term) advice, support (training) and guidance in dealing with, understanding and applying fire management and the related activities of compiling, analysing, and applying fire information. The long term effort should be to support a clear concept of the use and application of fire information and its related technology for fire management and respectively land use planning to develop and support institutional structures and mechanisms. As a result land management agencies tasked with fire and land management will know when to take the necessary actions for fire management and the combat of associated problems.



RINGKASAN (INDONESIAN SUMMARY)

Situasi kebakaran di Indonesia selama 7 tahun terakhir mendesak pentingnya keberadaan Sistem Informasi Kebakaran (SIK) untuk menopang upaya pengelolaan kebakaran. Informasi kebakaran yang segera tersedia dan siap pakai merupakan perekat yang berfungsi memperkuat pengelolaan kebakaran. Informasi yang berkaitan dengan kebakaran yang dikompilasi secara terus menerus, di analisis ulang serta siap untuk didistribusikan merupakan faktor penting bagi 5 komponen pengelolaan kebakaran dan menghubungkan kelima komponen tersebut satu sama lain sehingga membentuk suatu siklus. Informasi berkaitan erat dengan analisis dan bahkan saling mendukung satu sama lain, karena analisis dilakukan berdasarkan data dan informasi dan perlu dilakukan secara terus menerus agar dapat mendukung komponen lain dari langkah pengelolaan kebakaran. Tujuan dari informasi kebakaran adalah menyediakan informasi terkompilasi dan telah dianalisis yang diperlukan untuk memacu langkah pengelolaan kebakaran dan untuk pengambilan keputusan, langkah kerja dan rekomendasi yang berkaitan dengan fungsi pengelolaan kebakaran, serta bagi semua stakeholder pada semua tingkat.

South Sumatra Forest Fire Management Project berupaya mengembangkan dan membangun Sistem Informasi Kebakaran yang menyatu dengan suatu struktur institusi yang berfungsi menopang upaya pengelolaan kebakaran. Struktur institusi, hukum dan peraturan yang ada sekarang menunjuk Kementerian Lingkungan Hidup (monitoring, evaluasi, dan kebijakan) sebagai institusi utama pengelolaan informasi kebakaran di bawah koordinasi Badan Pengelolaan Bencana Alam (BAKORNAS PBP). Dukungan dalam bentuk sumberdaya dan informasi disediakan oleh beberapa institusi lainnya. Selain itu, berbagai elemen informasi kebakaran sesungguhnya sudah tersedia. Namun kenyataannya masih terdapat kelemahan dalam sistem penggunaan dan pemanfaatan informasi, begitu juga dalam pemanfaatan informasi tersebut dalam pengambilan keputusan pada tingkat regional dan/atau lokal.

Tugas pengelolaan informasi kebakaran belum secara institusional baik. Hal-hal yang berkaitan dengan institusi pengelolaan lahan dan mekanisme koordinasi antara tingkat lokal, kabupaten, dan nasional masih belum berkembang dengan baik. Oleh karena itu, aplikasi dan implementasi informasi yang ada untuk mendukung pengambilan keputusan, perencanaan regional atau untuk memacu aktivitas yang bersifat merespon peristiwa kebakaran seringkali berbenturan dengan peran dan tugas badan pemerintah yang tidak jelas. Sehubungan dengan desentralisasi, peran baru (pengelolaan kebakaran) badan pemerintah sebagai personal pemerintah pada tingkat regional/kecamatan harus dipelajari dan diisi dengan sebagian tugas, fungsi dan petunjuk pelaksanaan (tanggung jawab) yang baru. Desentralisasi menuntut staf yang handal (dari sisi pengetahuan, keahlian, dan kompetensi) dan meningkatkan pentingnya pembangunan/pembentukan kapasitas pada tingkat organisasi (struktur, prosedur, proses pengambilan keputusan) maupun tingkat sistem



(kerangka kerja yang legal, kebijakan) terutama pada tingkat propinsi, kabupaten, dan lokal.

Dewasa ini, hanya ada satu organisasi pengelolaan kebakaran yang operasional di tingkat propinsi di Indonesia, berbasis dua puluh empat jam melaksanakan tugas pengelolaan kebakaran. “Unit Pelaksana Teknis Daerah “ (UPTD) di Kalimantan Timur merupakan unit di bawah tanggung jawab Dinas Kehutanan Propinsi dan terdiri dari unit teknis, yaitu administrasi, operasi dan pencegahan kebakaran, dan informasi kebakaran. Unit informasi kebakaran tidak hanya mengumpulkan dan menerbitkan informasi, tetapi juga menganalisis dan memanfaatkan informasi tersebut melalui proses yang sudah standar dengan menentukan tingkat kesiapan untuk memacu aktivitas yang berkaitan dengan pengelolaan kebakaran. Unit ini secara regular mendistribusikan informasi kebakaran kepada para pihak terkait dan berminat dan menerima laporan yang berkaitan dengan aktivitas pencegahan kebakaran dari badan-badan tingkat lokal. Sebagai contoh adalah unit yang ada di Kalimantan Timur yang menyediakan berbagai aspek yang dapat diadopsi untuk daerah lain.

Untuk memperkuat badan yang sudah ada dan perannya dalam pengelolaan kebakaran di Sumatera Selatan, SSFFMP telah memulai proses berulang untuk mengidentifikasi komponen dan elemen Sistem Informasi Kebakaran, misalnya data/informasi yang sudah ada, penyedia data, analisis data, pemakai, koordinasi, komunikasi dan prosedur dan sistem pelaporan. Selama proses tersebut, berbagai proses konsultasi yang melibatkan para pihak dan publik, lokakarya dan pertemuan telah dihadiri, diorganisir dan difasilitasi. Pemaparan juga sudah dilaksanakan dan berbagai bahan/publikasi yang berkaitan dengan informasi kebakaran dan lima komponen pengelolaan kebakaran juga telah tersedia. Oleh karena itu, telah dirancang konsep keterlibatan dan peran organisasi dan badan dalam informasi kebakaran di tingkat propinsi dan kabupaten.

Hasil lokakarya dengan jelas memperlihatkan adanya kecenderungan terutama di tingkat kabupaten terlalu banyaknya pihak yang terlibat dalam aktivitas informasi kebakaran dan adanya pelimpahan tugas kepada pihak yang kurang relevan. Pihak-pihak tersebut hampir tidak bisa menyelesaikan tugas yang dilimpahkan. Selain itu, mereka juga hampir tidak mampu secara komprehensif mengkoordinasikan struktur pengelolaan kebakaran dengan tugas terkaitnya. Ini terjadi sebagai akibat kurangnya pemahaman konsep pengelolaan kebakaran itu sendiri dan tugas-tugas yang terkait. Selain itu, hasil lokakarya juga memperlihatkan bahwa badan pelayanan masyarakat di tingkat kabupaten belum secara penuh memahami peran dan fungsinya, misalnya jika Badan Persatuan Bangsa dan Perlindungan Masyarakat dipilih sebagai agen utama Sistem Informasi Kebakaran, maka fungsi koordinasi pengelolaan bencana disalahartikan. Selanjutnya, peran Badan Lingkungan di tingkat kabupaten tidak diketahui atau dikenal. Situasi ini menunjukkan bahwa di tingkat kabupaten terdapat kesenjangan informasi dan pengetahuan tentang persoalan politis dan actual terutama yang berkaitan dengan pengelolaan kebakaran dan juga yang berkaitan



dengan peran dan fungsi badan pelayanan masyarakat secara umum.

Badan informasi kebakaran pemerintah (dalam jangka panjang) memerlukan masukan, dukungan (pelatihan) dan bimbingan yang berkaitan dengan, dalam pemahaman dan aplikasi pengelolaan kebakaran dan kompilasi, analisis dan aplikasi informasi kebakaran. Upaya jangka panjang haruslah dapat mendukung konsep penggunaan dan aplikasi informasi kebakaran dan teknologi terkait serta perencanaan tata guna lahan dengan tujuan untuk mengembangkan dan menopang struktur dan mekanisme institusional. Oleh karena itu, badan pengelolaan lahan yang diberi tugas sehubungan dengan pengelolaan lahan dan kebakaran akan dapat mengetahui waktu yang tepat kapan mereka harus mengambil tindakan pengelolaan kebakaran dan menanggulangi persoalan yang timbul.



ABBREVIATIONS AND ACRONYMS

Abbreviation	Indonesian	English
ASMC		ASEAN Specialised Meteorological Centre
BAKORNAS PBP	Badan Koordinasi Nasional Penganggulangan Bencana	National Co-ordinating Agency for Emergencies (Disasters)
Bapedalda	Badan Badan Peningkatan Dampak Lingkungan	Environmental Control Agency on the Provincial Level
BAPPEDA	Badan Perencanaan Pembangunan Daerah	Regional Development Planning Board
Baplan	Badan Planologi	Forest Planning section at the National level
BKSDA	Balai Konservasi Sumber Daya Alam	Agency for Natural Resource Conservation
BMG	Badan Meteorologi dan Geofiskia	Agency for Meteorology and Geophysics
BPDAS	Badan Pengelola Daerah Aliran Sungai	
BPKH	Badan Pengukuhan Kawasan Hutan	Regional Forest Planning Agency
BPN	Badan Pertahanan Nasional	National Land Agency
BPPT	Badan Pengkajian Dan Penerapan Teknologi	Agency for Assessment and Application of Technology
BrigDalKarhut	Brigade Pengendalian Kebakaran Hutan	Forest Fire brigades
Cabdin	Cabang Dinas	Department branch
Camat		Subdistrict head
Damkar	Komandan Daerah Kebakaran	Commandant of Local Fire Operation
DAOPS	Daerah Operasi	Operational area
DepHut	Department Kehutanan	Ministry of Forestry (MoF)
DIS	Kabupaten	District
Dishut	Dinas Kehutanan	Forestry Department
Dishutbun	Dinas Kehutanan dan Perkebunan	Forestry and Estate Crop Department
Distan	Dins Pertanian	Agriculture Department
Disdik	Dinas Penedidikan	Education Department
Dislinkup Pertanian	Dinas-dinas pada lingkup pertanian	Similar to Agriculture Department
Distamben & LH	Dinas Pertambangan & Lingkungan Hidup	Mining and Environment Department
DisTanak	Dinas Pertenakan	Departement for Stock breeding
Dinas Kesos	Dinas Kesejahteraan	Social Welfare Service
DJ PHKA	Direktorat Jenderal Perlindungan Hutan dan Konservasi Alam	Directorate General of Forest Protection and Nature Conservation
Dit. PKH	Direktorat Pengendalian Kebakaran Hutan	Fire Control Directorate of MoF
EU	Uni Eropa	European Union
FDR	Peringkat Bahaya Kebakaran	Fire Danger Rating



FFPMP		Forest Fire and Prevention Management Project (JICA)
FIS	Sistem Informasi Kebakaran	Fire Information System
GTZ		German Technical Co-operation/ Gesellschaft für Technische Zusammenarbeit
HPH	Hak Penguasaan Hutan	Forest concession
HTI	Hutan Timber Industri	Forest plantation
IFFM		Integrated Forest Fire Management
ISPU	Indeks Standar Polusi Udara	Air Pollution Index
JICA		Japanese International Cooperation Agency
Infokom	Informasi dan Komunikasi	Information and communication
Kab.	Kabupaten	District
KaDes	Kepala Desa	Village head
Kadishut	Kepala Dinas Kehutanan	Head of Forestry Department
Kalinmas	Kantor Lingkungan Masyarakat	Bureau for Civil Society Protection
Kec.	Kecamatan	Subdistrict
KesBangLinMas	Kesatuan Bangsa dan Lingkungan Masyarakat	Agency for National Unity and Civil Society Protection
LAPAN		Indonesian Space and Aviation Agency
LH	Lingkungan Hidup	Environment
LSM	Lembaga Swadaya Masyarakat	Non-Governmental Organisation
KLH	Kementrian Lingkungan Hidup	Ministry of Environment
MuBa	Musi Banyuasin	
KARHUT-LA	Kebakaran Hutan dan Lahan	Forest and Land Fire
KTNA	Kelompok Tani dan Nelayan Andalan	Advance Farmers and Fishermen Group
Menko Kesra	Mentri Koordinator Kesejahteraan Rakyat	Coordinating Minister for People's Welfare
MODIS		Moderate Resolution Imaging Spectroradiometer
MoF	Departemen Kehutanan	Ministry of Forestry
MoU	Perjanjian Kerjasama	Memorandum of Understanding
NASA		National Aeronautics and Space Administration
NGO	Organisasi Non Pemerintah	Non-Governmental Agency
NOAA		National Oceanic and Atmospheric Administration
OKI	Ogan Komering Ilir	
ORMAS	Organisasi Masyarakat	Community cooperative
PBK	Regu Pemadam Kebakaran	Fire suppression crew
PDE	Pusat Data Electronic	Electronic data centre
PHKA	Perlindungan Hutan dan Konservasi Alam	Departement of Forest Protection and Natural Conservation in MoF
Pem Kab	Pemerintah Kabupaten	District Government
POLRI	Kepolisian Negara Republik Indonesia	National Indonesian Police

X



PPL		
PPNS	Penyedik Pegawai Negri Sipil	
Prop	Propinsi	Province
PT.	Perseroan Terbatas	Limited Enterprise
PU	Pekerejan Umum	Public Work
PUSDALOPS	Pusat Pengendalian Operasional	Fire suppression Centre
PusKesmas	Pusat Kesehatan Masyarakat	Local Health Centre
Satgas	Satuan Tugas PBP	Task Force PBP
SATKORLAK PBP	Satuan Koordinasi Pelaksana PBP	Implementation Coordination Unit PBP
SATLAK	Satuan Pelaksana PBP	Implementation Unit PBP
SATLAKDALKARHUTLA	Satuan Pelaksana Pengendalian Kebakaran Hutan dan Lahan PBP	Implementation Unit for Forest and Land Fire Control
SDM	Sumber Daya Manusia	Human Resources
SEAFDRS		South East Asian Fire Danger Rating System
SSFFMP		South Sumatra Forest Fire Management project
SOP		Standard Operating Procedures
SPBK	Sistem Peringkat Bahaya Kebakaran	Fire Danger Rating Ssystem
Subdin	Sub Dinas	Subordinate Agency
TM		Thematic Mapper
TN	Tanam Nasional	National Park
TNI	Tentara Nasional Indonesia	National Indonesian Military
UPTD	Unit Pelaksana Teknik Daerah	Technical Implementation Unit
Wil	Wilayah	Region



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1 Objective of the mission

The South Sumatra Forest Fire Management Project is a co-operation project between the Government of Indonesia and the European Union. It aims to:

Aid and facilitate the establishment of a coordinated system of fire management at the province, district, sub-district, and village level throughout South Sumatra in which the local communities, private sector companies and government agencies work together to reduce negative impact of fires on the natural and social environment.

In this context the present mission aimed to support relevant agencies at the regional level to improve the fire information distribution system to support Government and NGO's to establish systems to monitor the impact of improved fire management on the environment and people and the results of the work placed in the public domain.

Identification of the relevant fire information agencies in South Sumatra (and Indonesia) and introducing elements of a Fire Information System (FIS) to them is part of implementing an efficient and effective fire management system or Integrated Fire Management including the five components of fire management: 1.) Analysis; 2.) Prevention; 3.) Preparedness; 4.) Response; 5.) Restoration. Fire related information constantly collected and re-analysed as well as readily distributed is indispensable for all five components and links them up in a continuous cycle (please also refer to Report No 1 & 2 "Institutional development of fire management in South Sumatra" 2004).

2 Introduction

The fire situations in Indonesia over the last 7 years emphasize the necessity for an applied Fire Information System (FIS) to support efforts of fire management. Readily available and used fire information is the glue that underpins balanced fire management. Introducing important elements of fire information such as analysis of fire causes, Fire Danger Rating (FDR), hotspot detection and interpretation in combination with land use data, weather forecasting and information about vegetation cover and land use hence fire risk and hazards to relevant fire management agencies in South Sumatra is part of implementing an integrated fire management system. Integrated Fire Management includes the five components of fire management: 1.) Analysis; 2.) Prevention; 3.) Preparedness; 4.) Response; 5.) Restoration (see also report No. 2 on “Institutional Development for Fire Management in South Sumatra”, 2005).

Fire related information constantly collected and re-analysed as well as readily distributed is indispensable for all five components and links them up in a continuous cycle (Figure 1). Information is closely linked to analysis and is even mutually supportive, since analysis is based on data and information and needs to be continuously conducted in order to support the other components of fire management.

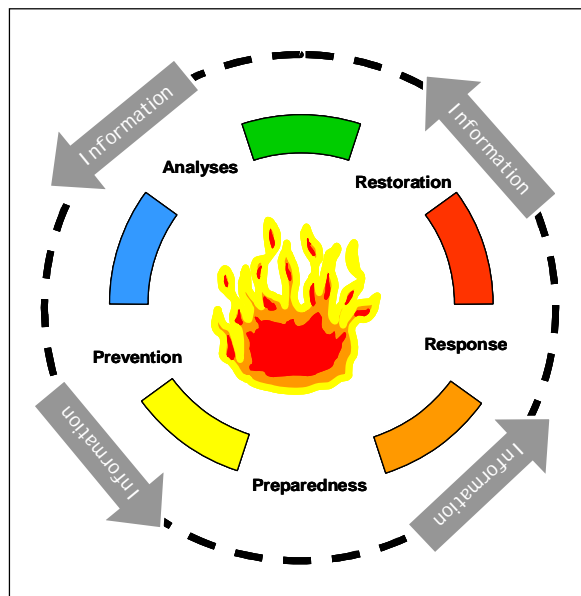


Figure 1: Fire Management Cycle and its components



Information and analysis - While fire suppression capabilities are needed, they can only be effective if embedded in an integrated program with the right institutional set up. All stakeholders must be involved in it through educational and fire prevention/fire-use programs. Lack of available information concerning number, place, size, and location, influence of weather, fuel characteristics, and causes of fire strongly contributes to an incomplete understanding of fire and its causes. This is a main reason for governments in the region reacting to fire events only as symptoms instead of addressing the underlying causes. Present fire related legislation reflects this lack of analysis and comprehensive understanding of the fire “problem” since it focuses on suppression only. To prevent fires one has to understand why and when fires occur.

Analysis is essential to define the problem to clearly address it and using resources as efficiently as possible. For effective preparedness and suppression efforts knowledge of time and location of fire occurrence is important; this includes also fire danger information and comprehensive data about available fire suppression resources (equipment, trained crews etc.). A clear distinction between wanted and unwanted fires is necessary to use forces most effectively.

To address aspects of restoration and rehabilitation measures and to integrate those into spatial regional and financial planning a damage assessment is necessary. This information, reported by local (fire) institutions and fire brigades must inform future prevention measures and equipment.

A fire information system managing (spatial) fire related data and information in an integrated manner would be model for an efficient support of fire management activities on the ground and at the political level.



3 Approach

The key element of the approach was the active involvement of important governmental land management agencies through workshops, seminars, and meetings in order to enable and stimulate stakeholders to identify and elaborate on their respective roles, functions, and responsibilities in fire management with focus on fire information.

During the mission the project/author has facilitated a variety of multi-stakeholder and on-going public consultation processes, attended and organised several workshops and meetings. She/they also made presentations and provided various material about (existing) fire information and about the five main components of fire management. As a result first draft concepts of involvement and roles of organisations and agencies for fire information at provincial and district level have been designed. The drafting process involved national, provincial, and district organisations and agencies dealing with the different aspects of fire information to build and create a common and better understanding of the problems to be tackled and solutions for efficient information collection, analysis and distribution. These processes have been supported through using, establishing and maintaining intensive networks and to draw on existing structures and experiences.



4 Summary and results for the counterpart

The South Sumatra Forest Fire Management Project attempts to develop and built a fire information system that is embedded into the appropriate institutional structures to support fire management efforts. The objective of fire information is to provide compiled and analysed information necessary to trigger fire management activities as well as for decision-making, procedures and recommendations to all functions of fire management and to other stakeholders at all levels.

In order to achieve this objective the data and information should be consistent, reliable, and relevant based on professional interpretation and analysis. The information should be delivered on time and should be communicated by pre-determined and understood procedures and standards, including accountability and responsibility, to ensure relevant, open and easily accessible information to all stakeholders.

Ideally, one main institution should be responsible for the compilation, analysis and dissemination of the information. The existing institutional structures as well as existing laws and regulation presently name the Ministry of Environment (monitoring, evaluation and policy) as the main agent for (management of) fire information under the coordination of the Natural Disaster Management Board. Support of resources and information shall be provided by other several agencies (see also Report No. 1 and 2 on Institutional Development 2004/5). Several elements of fire information already exist (see section 4.1).

To strengthen the existing agencies and their role in fire management, SSFFMP has started an iterative process to identify components and elements of a Fire Information System such as existing data/information, data provider, data analysts, end users, coordination, communication as well as reporting procedures and systems. Yet, a functional fire information system is closely linked to the effectiveness and efficacy of the institutional structures for fire management. Unless the overall and local institutional structures and responsibilities for fire management and its main components, and in this particular case, for fire information are clarified, it is doubtful that consistent and reliable data and information will be available and analysed as well as disseminated to all relevant stakeholders and users.

The results of the workshop and work meetings held shall be used to further design a capacity building program to operate and apply a fire information system by simultaneously clarifying the organizational structures and responsibilities hence functions of the involved land and fire management agencies.



4.1 Existing fire information

Various elements of fire information are already available such as daily hotspot detection/coordinates offered by various sources via internet and e-mail distribution although the detection results differ from each other due various reasons (see section 5) (e.g. Singapore–ASEAN Specialised Meteorological Centre (ASMC), Ministry of Forestry via the Japanese International Cooperation Agency (JICA) funded project both NOAA- hotspots (National Oceanic and Atmospheric Administration), the MODIS (Moderate Resolution Imaging Spectroradiometer) satellite via the US-NASA (United States–National Aeronautics and Space Administration) or Indonesian Space Agency (LAPAN) homepage.

Furthermore there is the recently developed South East Asian Fire Danger Rating System (SEAFDRS) introduced by the Canadian Forest Service (CFS) and presently operated by the Indonesian Meteorological Service (BMG). The SEAFDRS provides early warning of the potential for serious fire and haze events assisting fire managers to prevent them by giving them sufficient time to implement operational plans, which can reduce the number of active fires.

In addition, the forestry department provides training for the production of fire hazard/fuel maps in the most fire prone areas with the help of vegetation maps derived from Landsat TM imagery. This could serve as a basis for a more detailed fire risk map that finally is a tool for strategic fire management planning.

Moreover, daily weather information but also smoke-haze occurrence and distribution are accessible on websites of various organisations. SSFFMP has listed and described the various existing information including the sources and internet addresses in a booklet (Solichin, 2004: *Panduan Pengumpulan Informasi Kebakaran Hutan dan Lahan melalui Internet*). The booklet is available at project site.

GIS data on land use and cover, infrastructure and settlements is normally available at the various responsible agencies. The Regional Land Agency (BPN) in general compiles non-forest land use such as estate crops and settlement and transmigration data. The Forestry Department, Estate Crop, and Transmigration Departments (if not compiled via BPN) gather and produce data about their respective fields. For regional planning purposes all the data should normally be obtainable through the Regional Planning Agency (Bappeda). However the reality is unfortunately quite different in terms of availability and open access of the data but also in terms of quality and reliability of the data (see also 5.1).



4.1.1 Fire Information System of East Kalimantan

Currently, there is only one fire management organization operational at the provincial level in Indonesia that is operating on a fulltime basis carrying out the daily tasks of fire management. East Kalimantan established in 2001 a technical agency within the Provincial Forest Service to manage forest and land fires. The “Unit Pelaksanaan Teknis Daerah” (UPTD) is under the responsibility of the provincial forestry department and consists of three technical units, i.e. administration, fire operation and prevention, and fire information. The fire management agency mainly follows the concept of the formerly GTZ supported Integrated Fire Management Project (IFFM) (see also report “Institutional Development” No. 1, 2004).

The objectives of the fire information unit are to compile and analyze fire relevant data for monitoring vegetation fires (hotspots related to land use and concession boundaries), determining readiness levels, identifying fire risk areas and assessing the current and predicted fire situation (fire danger rating). This is done in order to provide information necessary to make recommendations to political decision makers, agencies, and institutions as well as specific procedural direction to district fire centres, fire brigades and other land management agencies (see appendix 2). The unit not only gathers and produces information; it also analyses and applies the information in a standardized process by determining readiness levels to trigger the related fire management activities. The readiness levels describe the existing state of alertness of the districts in East Kalimantan and of the entire province as well as describe the state of preparedness of the fire management organization. Readiness Levels are based on five elements that include:

- Fire Danger Rating
- Weather Forecast
- NOAA Hotspots
- Smoke/Haze Conditions
- Fire Activity Reported by Districts

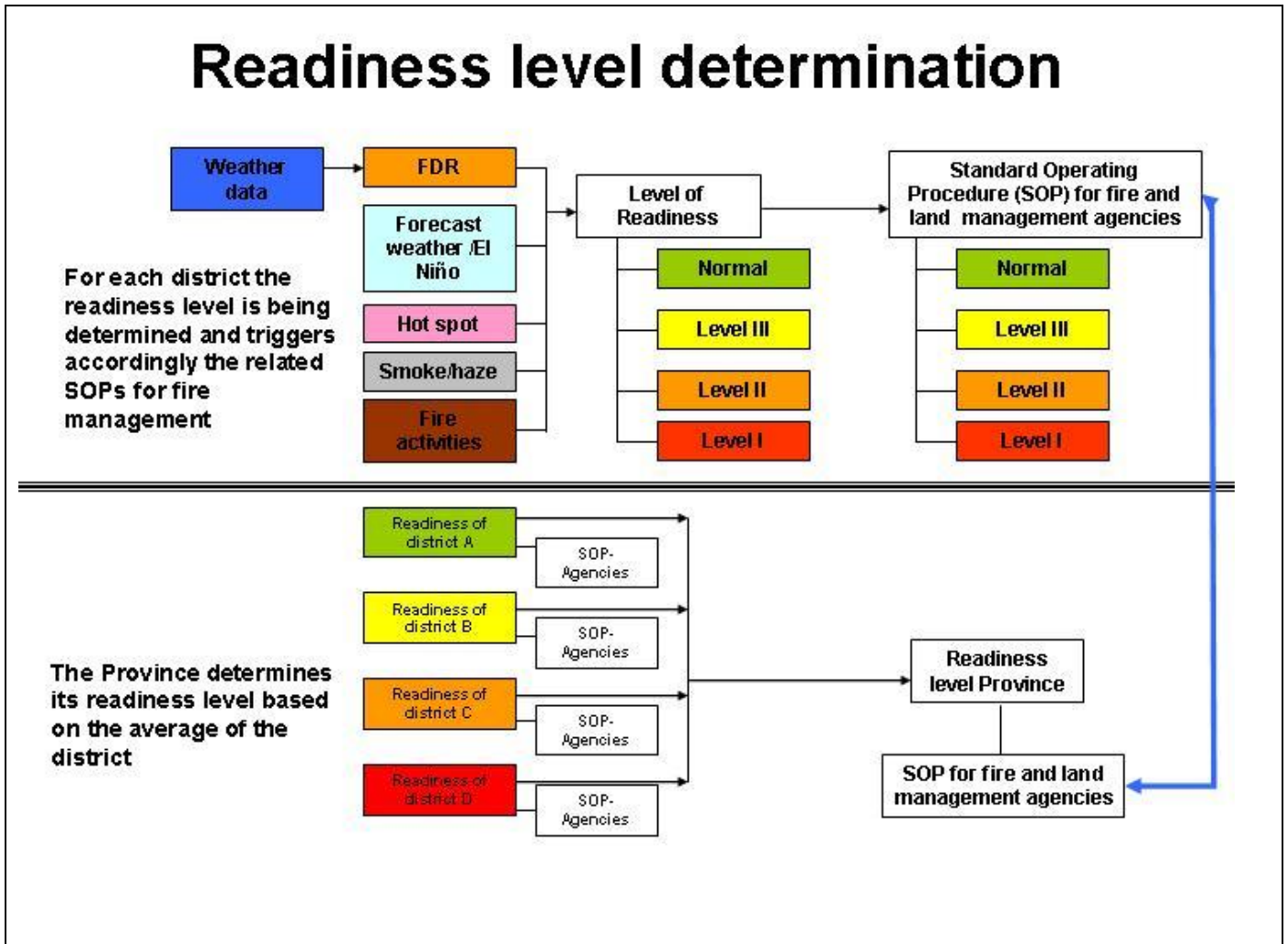


Figure 2: Readiness level determination

Figure 2 schematically shows the process of readiness level determination. On a regular basis fire managers from all sections of the Provincial Fire Management Agency evaluate the five elements using professional judgment to assess the current fire situation in the province and districts. The readiness level analysis form (see annex 3) is a guide to assist fire managers in their evaluation of these elements and to determine a readiness level for each district and the province. The result of this assessment is used to provide information/ recommendations to political officials, agencies, and institutions as well as specific procedural direction to local fire centres and other land management agencies.

Next to the readiness level determination process the fire information is regularly compiled in a fire bulletin (see annex 4) that is electronically distributed to stakeholders and other interested parties.



At the same time the fire management agency at the provincial level receives on a regular basis fire reports from the districts (see annex 5). This is in order to collect information about the location, the time, the extension, the type of vegetation, the possible fire cause, etc. This increases the knowledge and understanding of the fire causes and assists in planning fire management activities and allocation of fire management resources.

4.2 Decentralisation and fire information

Fire management tasks are not yet institutionalized in the respective land management agencies and co-ordination mechanisms that would link up national, provincial, district and local level are only rudimentarily in place. Thus even the application and implementation of existing information for decision making, regional planning or simply to trigger fire response activities is often hampered by the unclear tasks and roles of the governmental agencies. In the course of decentralisation the role of the governmental agencies as civil servants for good public services is not yet well understood and the poor public services that have existed for decades in Indonesia are only slowly starting to change. The consequent new roles of the governmental agencies at the regional/district level have yet to be learned and filled with partly new tasks, functions, and job descriptions (refer to report “Institutional development no. 2, section 4.3). Decentralisation intensifies the need for capable staff (knowledge, skills, and competency) and increases the importance of capacity building at organisational (structures, procedures, decision making processes) and system level (legal framework, policies) especially at the provincial, district, and local level.

In case of capacity building for fire management and in particular for a fire information system that includes also the application of sophisticated technology this task is twice as difficult since fire management is a relatively new aspect in Indonesia and is not yet institutionalised (see report on “Institutional Development, part II, section 4.2.) It is neither running well at national level nor are there any good examples where all three levels and their inherent interdependencies are well connected and functioning. Therefore, the resulting (entirely) new fire management roles of the governmental agencies at the regional but also at the national level have to be learned and filled with new tasks, functions and job descriptions. Governmental agencies require (long-term) support and guidance in understanding and applying fire management from the technical side, but also from the analytical, preventive and political side to achieve this goal.

In order capacity building in fire management to be sustainable, assessment and implementation should not be limited to one level alone but it should always cover



all three (system, organisational and individual) levels at the major administrative levels. This means that e.g. fire fighting or information technology training measures at the district level for individuals/villages will hardly sustain if corresponding measures are not undertaken to enhance and to build capacities at the organisational and system level that does not rule out certain measure at the provincial and national level. In addition to technical training for suppression capacities and information technology serving among others to create personal networks amongst various levels concepts and procedures for decision making processes, reporting mechanisms, interagency standards etc. need to be created and delivered.

Capacity building in fire management is an important factor of creating a well-functioning decentralised civil service supporting decentralisation in order to help the government to fulfil its obligations. As a result there should be a clear concept for fire management in Indonesia to develop and support institutional structures and mechanisms.

4.3 Results of the district workshops

Semi-workshops and work meetings were held with the fire management working groups of the three priority districts. The participants were asked to outline an institutional concept for a Fire Information System (FIS) that included the elements of early warning, smoke haze monitoring, fire monitoring, and data base management of human and equipment resources. The participants of the first workshop in Musa Banyuasin (MuBa) were asked to name the main institutions, which should compile, manage and disseminate the respective information. Based on the experiences of the first workshop the following workshops with Banyuasin and Ogan Komering Ilir (OKI) had a slightly different set up. The topics of smoke monitoring and data base management were excluded in order to reduce complexity. On the other hand the question regarding who are the end users receiving and applying the information has been included.

Setting prerequisites such as considering the given situation and conditions with regard to roles and functions in their respective departments the groups (districts) came up with a first, simple concept facilitated with the help of meta-plan cards.

These results provided the basis material at the provincial FIS workshop (see section 4.4).



Table 1: Result of workshop of Musa Banyuasin for fire information

MuBa Fire Information				
Instansi utama: KesBangLinMas				
	Early warning	Smoke monitoring	Fire monitoring	Data base
Compilation	PDE, Dishut, Distan, PU Pen	PDE, Bapedalda, Diskes, Dishub	PDE, Bapedalda, Kesbanglinmas, Dishut, Disbun, Distran	PDE, Dishut, DikNas, Disbun, Distanak
Management	Kesbanglinmas, PDE, Dishut, Disbun	Bapedalda, Dikes	Dishut, Disbun, PDE, Bapedalda	Dishut, Disbun, Kesbanglinmas,
Dissemination	Kesbanglinmas, PDE, Infokom, Humas PemKab	Infokom, PDE, Humas, Dinkas, Diskes	Infokom, Humas, PDE, Kesbanglinmas, Bapedalda	PDE, Infokom, Humas, Kesbanglinmas

Note: For the acronyms and abbreviations please refer to abbreviation list.



Table 2: Result of workshop of Banyuasin for fire information

Banyuasin Fire Information			
Instansi utama: Dishutbun			
Compilation	Stasiun Klimatologi Balit Sembawa		Dishutbun
	BMG Kenten		Kesbanglinmas
	Cabdin. Pertanian Kec.		
Management	Dishutbun		Kesbanglinmas
	Stasiun Klimatologi Perusahaan Kebun		Dishutbun
Dissemination	Santelda. Pemda Banyuasin		Idem ←
	Dishutbun		
	Kesbanglinmas		
Recipients	DisDik		Idem ←
	Distamben & LH	Perusahaan Hutan & Kebun	
	Distan	PT. Expan	
	Camat	Mass Media	
	KaDes		

Note: For the acronyms and abbreviations please refer to abbreviation list.

Table 3: Result of workshop of OKI for fire information

OKI SIK			
Instansi utama: Dishut			
	Early warning		Fire detection
Compilation	STA. Penangkar C.H. Kec./Perusahaan	BMG Pusat	Dishut Prop.
	Dinas PU		Dishut Kab.
	Dis. Perta		Kantor Tamben & LH
Management	BMG Prop	BMG Pusat	Dishut Kab.
	Distan/Dishut		Kantor Tamben & LH
Dissemination	BMG Prop	Dishut Kab.	Dishut Kab.
	Distan/Dishut		Distan
			Disbun
Recipients	Dinas Instansi yg. terkait		Camat
	Perusahaan Kebun dan Hutan		KaDes
	Masyarakat		Tokoh Masyarakat
	Media		Perusahaan Hutan & Kebun
			Penyuluh

Note: For the acronyms and abbreviations please refer to abbreviation list.



4.4 Results of the province workshop

A two-day Fire Information System workshop was held at the provincial level, attended by representatives from all three administrative levels dealing with fire information and management. The workshop had the following objectives:

- to introduce the components of a fire information system and its use for fire management,
- to identify existing problems and to strengthen/increase the information dissemination system down to the local level,
- to identify work and co-operation models and mechanisms between the national, provincial, and district level.

The detailed agenda, list of participants and speakers as well as summaries of the presentations are available in the workshop report “Fire Information System” by Edy Marbyanato, 2004.

The participants were divided into three workgroups according to district, provincial, and cross-administrative level. The individual workgroups did not only consist of participants representing the respective administrative level, but each group had representatives of all levels to ensure the exchange of knowledge and experiences and to provide a maximum of synergies.

The workgroups were requested to elaborate on the following topics:

- Identification of main information needed in both directions (from the field level up to provincial/national level and vice versa);
- Identification of the main institutions that will compile, analyse and manage the information and data in the FIS (These results were produced in the previous workshops held in the districts, see section 4.3);
- Identification of supporting information and data as well as their provider;
- Identification of the data and information format needed by the end users;
- Working mechanism amongst levels and stakeholders (vertically and horizontally).



The results are as follows:

Main institutions chosen for managing and developing the Fire Information system are:

At district level

- Nation Unity and Civil Protection Agency in Musa Banyuasin
- Forestry and Estate Crop Department in Musa Banyuasin
- Forestry Department in Ogan Komering Ilir

At provincial level

- Environmental Department

Table 4: Main information needed (workgroup district level)

INFORMASI UTAMA YANG DIPRIORITASKAN TAHUN 2005	
TOP DOWN (Data dari provider tingkat nasional)	BOTTOM – UP (Data dari lapangan)
- Pemantauan Hotspot NOAA, MODIS - Hotspot dan Penyebarannya	- Lokasi Kebakaran - Ground Check Hotspot, tindak lanjut ke lapangan
-Sistem Peringkat Bahaya Kebakaran - BMG Jakarta - Keadaan cuaca, iklim (terutama masa bulan kering /kemarau) dari BMG atau stasiun cuaca lain	- Curah Hujan lokal - Temperatur Udara lokal
	- Data Sumber Daya kemampuan pemadaman Kebakaran seperti : Regu, peralatan pemadaman, komunikasi dan transportasi - Sarana prasarana regu pemadam kebakaran di perusahaan
Data perusahaan perkebunan yang sedang melakukan perluasan areal Data Perusahaan yang Sudah Ada / Belum Memiliki	-Data Lahan Hutan yang rawan kebakaran
- Data Dampak Kebakaran - Jarak Pandang (visibility) - Luas Kebakaran dari satelit	- Luas kebakaran - Dampak kebakaran pulusi udara - Rehabilitasi daerah yang terkena karhutlah



Table 5: Identification of supporting data and information and provider (workgroup district

IDENTIFIKASI DATA PENUNJANG DAN INSTANSI DAERAH PENYEDIA		
BANYUASIN	MUBA	OKI
DISHUTBUN	DISHUT	DISHUT
- Batas Kawasan Hutbun - Batas Perusahaan Perkebunan / HTI - Data Sumberdaya Pemadaman Polhut - Lokasi Kebakaran	- Kawasan Hutan - Perusahaan HTI - Sumberdaya Pemadaman - Lokasi Kebakaran	- Kawasan Hutan - Perusahaan HTI - Sumberdaya Pemadaman - Lokasi Kebakaran
KESBANGLINMAS	DISBUN	DISBUN
- Data Sumberdaya Pemadaman - Peta Rawan Bencana (Manual)	- Data rencana Kegiatan Lahan Perkebunan Rencana Penyiapan Lahan - Data Sumberdaya Pemadaman - Data Cuaca di Perusahaan	- Data rencana Kegiatan Lahan Perkebunan Rencana Penyiapan Lahan - Data Sumberdaya Pemadaman - Data Cuaca di Perusahaan
DISPERTANIAN	KESBANGLINMAS	Kantor Pertambangan dan LH - Data Potensi Batubara
- Data Cuaca (CH) - Data PPL - Luas Wilayah Pertanian / Sonor	- Data Sumberdaya & sarana prasarana kebakaran - Data Rawan Bencana - Data Kejadian Bencana	
BALIBUN SEMBAWA	DINAS PERTANIAN	
- Data Cuaca CH, T, RH	DINAS PERTANIAN	BPS
BPS	- Data PPL - Data Luas Pertanian / Sonor - Data Cuaca	- Data Puskesmas dan Dokter
- Data Puskesmas, Dokter DINAS PERTAMBANGAN - Batas Perusahaan	BPS	BPN
BPN	- Data Puskesmas, dokter	- Landuse
- Data Landuse	DINAS TAMBANG	Dinas Pertanian
	- batas perusahaan - potensi batubara	- Kelompok Tani dan Penyuluh
	BPN	
	- Landuse	



Table 6: Main Information needed from national level (workgroup province)

INFORMASI UTAMA TOP – DOWN (DARI PROVIDER NASIONAL)			
No	JENIS INFORMASI	SUMBER INFORMASI	INSTANSI PENGGUNA
1	Hotspot - Sebaran Hotspot di lahan - lahan masyarakat, kebun, HTI, HPH - Sebaran Hotspot (Prop. Kab. Kec. Desa)	- LAPAN - JICA - DEPHUT	- Bapedalda - BPDAS MUSI - BKSDA, TN - Dinas Perkebunan - BMG (Prop.) - Dinas Kehutanan
			- Perusahaan (Perkebunan HPH, HTI, Pertambangan) - Dinas Pertanian
2	Perkiraan cuaca (Nasional)	- BMG (pusat) - LAPAN	- BMG Group - Dinas Perkebunan Prop. - Dinas Pertanian - Bapedalda - Dinas Kehutanan
3	Peringatan Dini Bahaya Kebakaran	- BMG Pusat - BMG Prop.	Idem No. 1
4	- Data Kualitas Udara Ambicut - Kualitas Udara (ISPV)	KLH	- Bapedalda - Dinas Kesehatan
5	Sebaran Asap + Arah Angin	KLH, BMG (ASMC)	
6	Tata Batas/ Tata Guna Lahan	BPN	Idem 1 & 2
7	Tipe Vegetasi di Sekitar Hotspot	Dinas Kehutanan Dephut (BAPLAN)	- Perusahaan (Perkebunan, Pertambangan, HPH, HTI) - Instansi yang Terkait dengan Pengguna Lahan



Table 7: Main information needed from the district/field level (workgroup province)

INFORMASI UTAMA BOTTOM – UP (Data laporan dari lapangan)			
No	JENIS INFORMASI	SUMBER INFORMASI	INSTANSI PENGGUNA
1	Laporan masyarakat (kejadian kebakaran)	Masyarakat	- Instansi Pemerintah & swasta terkait (idem no.1) - Bapedalda
2	- Lap. Ground Checking - Kendala Pengendalian - Upaya Pengendalian Pemadaman, Penegakan Hukum, dll)	- Bapedalda (Instansi Teknis Terkait - Multistakeholder forum (MSF) Kabupaten - LSM (konsorsium)	Instansi Pusat / Prop. , KLH, Dephut, Deptan Bapedalda
3	- Data Iklim (temperatur, Curah Hujan, Kelembaban) - Arah Angin - Jarak Pandang	- Stasiun Pengamat Cuaca Bandara (BMG) - Lap. Unsur Cuaca dari pos kerjasama	- KLH,I - Bapedalda / Dishut / Swasta, Perhubungan
4	Rencana pembukaan lahan perkebunan swasta	- Dinas perkebunan - BPN	- Swasta Pengguna Lahan - Instansi pusat & Prop. (Deptan, KLH/ Bapedalda)
5	Alat - Alat Pemadaman yang dimiliki instansi pemerintah & swasta	- Dinas kehutanan, perkebunan & Pertambangan - Bapedalda	- SATKORLAK - SATLAK - KESBANGLINMAS

Table 8: Main information and data format needed from national/province level (workgroup province)

FORMAT DATA (TOP - DOWN)			
1	Hotspot	Peta dan Tabulasi Tabulasi Harian 1. Prop./Kab./kec./Desa 2. Lahan (Masyarakat kab. HPH/HTI)	Internet (E-mail)
2	Prakiraan Cuaca	Bulletin Bulanan BMG	- Media Cetak - Website
3	Peringatan Dini Bahaya Kebakaran FDRS, KBDI	SPBK (Peta & Grafik)	- Mobile Station (Bapedalda Prop.) - Website KLH - Balai Hiperkes
4	Kualitas Udara (ISPU)	Tk. Kualitas udara (Low, Moderate, Unhealthy, dsb)	
5	Sebaran Asap + Arah Angin	Peta	Website
6	Tata Batas / Tata guna lahan	Peta administratif & penggunaan Lahan	Permintaan kepada (BPN & Bappeda)
7	Tipe Vegetasi disekitar HS	Permintaan kepada (BPN & Bappeda)	Permintaan kepada Balai Pranologi Prop.



Table 9: Main information and data format needed from district/local level (workgroup province)

FORMAT DATA (BOTTOM - UP)			
1	Lap. Masyarakat Kejadian Kebakaran	waktu, tempat (desa, Kec. Kab.). Jenis peruntukan Lahan, luasan, status lahan, sumber penyebab	Pencatatan Manual
2	Lap. Ground Cheking Kendala Pengendalian Upaya Pengendalian	1. Koordinat 2. Jenis Vegetasi yang Terbakar 3. Luasan 4. Sumber Api / Penyebab 5. Upaya Pengendalian 6. Kendala 7. Dampak Kebakaran	Laporan ke Kades, camat. Kab., prop. Terkait (manual)
3	Data Iklim Jarak Pandang	Tabulasi Data	Media Pos
4	Rencana Pembukaan Lahan Perkebunan swasta	- Lokasi (desa, Kec. & Kab.) - Luas Pembukaan - waktu / jadwal - metode	Laporan Manual
5	Alat - Alat Pemadaman yang dimiliki instansi pemerintah dan swasta	Tabulasi	Laporan Manual & digital



Table 10: Data provider, offered data and data user at the various levels

LEVEL	INSTANSI PENYEDIA DATA	SEDIA (OFFER)	INSTANSI PENGGUNA
N A S I O N	Dit. Penanggulangan Kebakaran Hutan	- Hotspot	DEPHUT - Dit. Penanggulangan kebakaran hutan
	FFPMP2 - PHKA JICA (Forest Fire Management Project 2)	- FSRIM (fire Spread Risk Index Map)	- BKPH Wilayah II Palembang
	BMG	1. Informasi SPBK Harian 2. Informasi Cuaca Harian 3. Informasi Prakiraan Musim	
A L	LAPAN	- NDVI - Hotspot	
	BAPEDALDA PROPINSI	- Hasil laporan dari Bapedalda Pengumpul / Kab./BMG/LAPAN - Potensi perencanaan kerusakan LH - Pencemaran / kerusakan lingkungan - Kualitas LH	- Instansi terkait (Pertambangan, Kehutana & Kesbang) - Masyarakat
	BPKH Wil II Palembang	- Data Hotspot - Data Spasial : (Peta dasar, Tematik & Citra Landsat) - Data potensi : (Hutan Teristris & Hutan non teristris)	Dinas Kehutanan
P R O P I N S I		- Data hasil inventarisasi	
	DINAS KEHUTANAN	- Kawasan hutan - Potensi hutan dan update - Pemanfaatan dan penggunaan kawasan hutan - Peta dasar & data Tematik lain - Data kawasan kebakaran - sdm - Peralatan - Pelatihan	
K A B U P A T E N	Instansi Lingkungan Hidup Kabupaten	- Jumlah Desa - Luas Lahan - SDM	- LH Kab, - Kecamatan - Desa - BAPPEDA untuk perencanaan pembangunan - Manggala AGNI (Cuaca
	Manggala Agni	- Peralatan - SDM	PT MHP



Table 11: Roles and needs of the stakeholders

KEBUTUHAN DAN PERAN MASING-MASING INSTANSI			
Level	INSTANSI	KEBUTUHAN	PERAN
N A S I O N A L	Dit. PKH	<ul style="list-style-type: none"> - Base Map - Lokasi Kebakaran - Luas Kebakaran - Tingkat Kerusakan dan Kerugian 	Penyedia Data Awal Hotspot
	JICA	<ul style="list-style-type: none"> - Umpan balik atas data hotspot - Jaringan komunikasi 	
	BMG	<ul style="list-style-type: none"> - Jaringan Komunikasi distribusi informasi - Feedback (umpan balik) dari informasi yang didistribusikan 	<ul style="list-style-type: none"> - Pendukung / penguat BMG Prop. & Kab. - Penyedia H/W & Pengembang metode BMG Prop. & Kab. - Provider & Distributor SPBK
	LAPAN BPKH Wil II Palembang	<ul style="list-style-type: none"> - Alat komunikasi yang efektif & Efisien - Software dan hardware - data lapang (untuk validasi) - Data kerusakan akibat kebakaran -data laju degradasi hutan 	<ul style="list-style-type: none"> - Mendukung penyediaan data inderaja untuk masalah lingkungan tingkat nasional - Penyedia data - Supporting system - desiminasi data
P R O P I N S I	Dinas Kehutanan Prop. Sumsel	<ul style="list-style-type: none"> - Sistem kerja yang jelas - pengembangan program secara bertahap 	<ul style="list-style-type: none"> - Menerima, analisa dan distribusi data di tk. Propinsi dan kabupaten - Pembinaan dan pelatihan
	Bapedalda Prop. Sumsel	<ul style="list-style-type: none"> - Prosedur Tetap untuk pemantauan, pengawasan dan penegakan hukum. - Mekanisme alur informasi yang jelas - Data luas dan dampak kebakaran - data hotspot - format laporan/data -data umpan balik atas informasi yang diberikan 	<ul style="list-style-type: none"> - Pengawasan pelaksanaan kelola lingkungan HTI perkebunan - Pengumpulan Bahan / Data lapangan untuk penegakan hukum - Koordinasi tingkat Propinsi & Kabupaten utk bid.Lingkungan Hidup - Pembinaan SDM
	Bappeda Prop. Sumsel		<ul style="list-style-type: none"> - Alokasi Dana - Perencana pembangunan
K A B U P A T E N	Instansi LH Kabupaten	<ul style="list-style-type: none"> - Data Penyebab kebakaran - data daerah rawan kebakaran - alokasi dana 	<ul style="list-style-type: none"> - Penyuluhan lingkungan hidup - Pusat Informasi kebakaran tingkat kabupaten - penyedia Informasi peringatan dini
	Bappeda Kabupaten	<ul style="list-style-type: none"> - Rencana anggaran pengelolaan kebakaran - sebaran hotspot 	
	PT MHP	<ul style="list-style-type: none"> - Data hotspot 	-Pengguna data hotspot



4.5 Analysis of the workshop results

The result tables of the province work group (table 6-8) of the workshop held at the provincial level are used here as a first matrix to design a concept for a Fire Information System. Information from the other work groups was added to refine it. Fundamental premise of the following concept are that (existing) fire information is produced and/or provided by the designated agencies and there is a matching dissemination structure. This shall ensure that roles and tasks, existing e.g. at a higher administrative level are not annulled or made inefficient by duplicating or reinventing these roles and tasks within another department. Already existing information often needs only to be introduced and its use explained and trained. However, the institutionalisation, i.e. the application of fire information in the respective land agencies is more difficult because it often requires entirely new or added job descriptions or even new positions. Assuming that a multi agency (under disaster management coordination) is the appropriate structural answer to fire management in Indonesia, pre-determined standard procedures for communication including accountability and responsibilities of the respective parties are indispensable. Furthermore, not only the communication has to follow certain standard procedures but more importantly also the related fire management activities that are triggered by the information provided. The key term in this respect is Standard Operating Procedures (SOP) following certain readiness levels that in turn are based on analysed fire information (see section 4.1.1 and annex 2-4).

Figure 3 shows a FIS concept connecting all three administrative levels. Only the main agents of a FIS are considered, not only to reduce complexity in the graphic but also to concentrate on the realization of practical achievements. The concept concentrates on using existing data for determination of readiness levels, which is done by the Environmental Agency (LH/Bapedalda). It receives and compiles the necessary data from the support agencies such as BMG, LAPAN etc. The Forestry department plays a major role in providing information about fire crews, available equipment and a reliable (field) fire reporting system (see example in annex 4). The role of the Agriculture Departments (at provincial and district level) is to provide information about (fire prevention) extension workers that can be mobilised throughout certain states of alertness and readiness. At the national level the role of the agriculture department is not yet apparent within a FIS; however principles are to provide analysis and concepts for fire use alternatives. The Nation Unity and Civil plays an important role in initiating, coordinating and also monitoring the activities of the involved parties following SOPs.

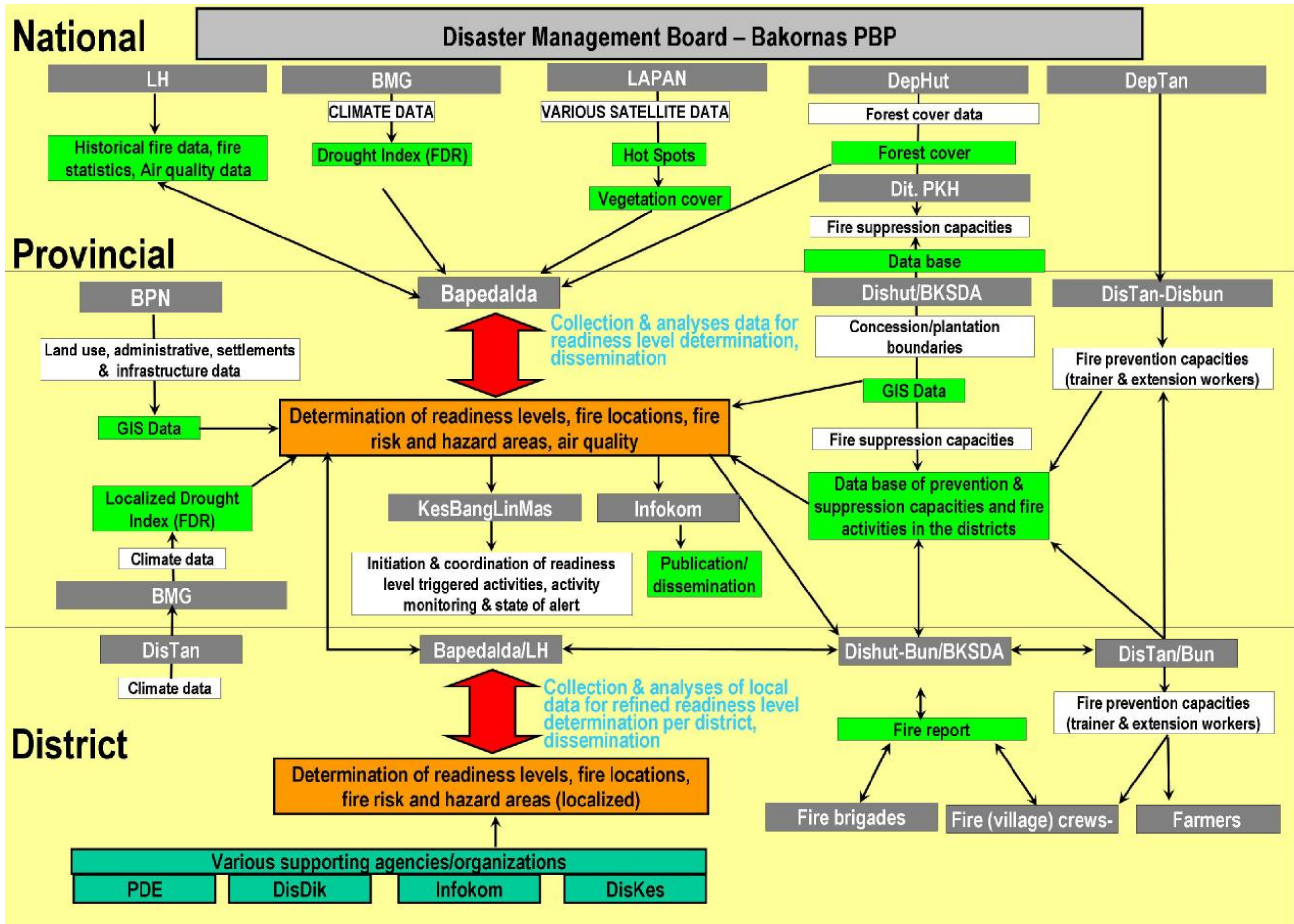


Figure 3: Proposal of a Fire Information concept



5 Conclusion and recommendations

The objective of fire information is to provide compiled and analysed information necessary to trigger fire management activities and to inform decision-making, procedures and recommendations to all functions of fire management and to other stakeholders at all levels. In addition, fire information plays a vital role in questions related to land use planning. Information about areas of high fire risk and/or hazard, previous fire damage, local habits of fire use etc. are important information to be incorporated into spatial planning at local and regional levels. They are indispensable for focused and efficient (and economically viable) fire management activities.

Fire information plays also an important role for advocate institutional and political structures with appropriate budget for operational fire management. Experiences in East Kalimantan have shown that the careful and liable analysis of fire information and the (economic) break-down of fire damage supported the political dialogue amongst decision makers towards a political and financial commitment to establish an operational fire management in East Kalimantan. This shows that fire information carefully analysed and presented can be a powerful tool in the political process of building and supporting institutional capacities for fire management. The fire information concept of East Kalimantan (section 4.1.1) serves as a first example for applied fire information in Indonesia.

Various elements of fire information are already available at all levels (see section 4). In combination with reliable land use data and boundaries it could be used in a geographical information system to further analyse it and derive information for strategic fire management activities and (land use) planning at the regional and local level (e.g. readiness levels, risk areas, focused campaigns etc.). However, in reality there is a lack of the systematic use and application of information and information sharing as well as application for decision making at the regional and/or local level. This is due to a lack of clear institutional structures combined with defined institutional roles, tasks and job descriptions in conjunction with underdeveloped knowledge and little human resources in all aspects of fire management.

In addition, the unclear and overlapping land use/rights and boundaries and the even more indistinguishable system of locally managed agro forestry/estate crop cooperatives, (“Hutan Inti Rakyat” or “Perkebunan Inti Rakyat”) hamper next to fire prosecution, also a more thorough analysis of the fire problem. Land use and cover data as well settlements and



infrastructure as described in 4.1., is in general a problem in Indonesia. They are neither easy available nor they are of good and proper (digital GIS) quality. They are often not actual hence not reflecting the situation on the ground. Moreover the Regional Planning Agency (Bappeda) often accomplishes not its tasks that are the coordination, collection and quality control of the land use data produced and provided by the respective land management agencies in order to carry out regional spatial planning. These are the major constraints for proper and sustainable land use planning considered to be important also for fire prevention measure.

Moreover digital (actual) land use and cover maps, representing of boundaries of forest concessions, oil palm and forest plantations, protected areas, transmigration settlements, locally managed agriculture and administrative boundaries are necessary to assist in the transfer of NOAA hotspot data to “on-the-ground” use. Hotspot data are not the ultimate answer to fire detection and initial attack information (see paragraph below). However, unless there is no better and economically viable solution in Indonesia this approach addresses the different hotspot locations to the current land status, manager and jurisdiction and is a first step towards a more precise localisation of fires and towards increased knowledge about sites for necessary suppression actions and future preventive measures. To further support fire management planning efforts such as prevention campaigns and land use data layers can be used to produce fire risk maps.

The case of fire monitoring or hotspot detection, which is one of the most popular fire information in Indonesia, reflects another dilemma of fire information. Distinctively different results are published by different agencies for fire events of the same day, observed by the same sensor, due to different processing and algorithms. Quality information or the fire detection algorithm is usually not provided.

However, there is no main institution overseeing the collection, use and the interpretation of the data as well as disseminating it. Due to the first reason no adequate trained and skilled personnel is available. Reliable and relevant fire data and information has to be consistently compiled and analysed in a Fire Information System (FIS). This is a fulltime task and requires highly skilled personnel trained in information technology. Furthermore, trustworthy methodical and analytical skills are required to analyse and interpret (input) data and information as well as produce useful products and information.

A capacity building program to support the aspect fire information should focus not on individual personnel in the first place (for fire information) but



should select the appropriate agencies. This selection should always be guided by the given framework for fire management that identifies the Environmental Agency as the main agent for a fire information system. It receives support from other agencies, which in turn provide the necessary data and secondary information. A functional fire information system is closely linked to the issue of institutional structures for fire management, which in turn require a clear and accepted understanding of fire management and its inherent tasks. The awareness of the functions needed for fire management will support the process to support, improve and, if necessary, restructure existing agencies and provide them with focused capacity building activities at system, organisational and individual level. In parallel there is the requirement that Indonesian authorities need to better effectively raise the awareness of their employees about the importance of the enforcement of current laws and regulations relating to fires.

The workshop results clearly show that there is the tendency mainly at the district level to involve too many players in fire information activities and assign duties to less relevant parties. They can hardly accomplish them nor do they comprehend it in the context of a functioning multi-agency fire management structure and the related activities. This is the consequence of a lack of understanding of fire management itself and its inherent tasks. Moreover, the results also show that the districts' civil service agencies have not yet fully understood their roles and functions, e.g. if the Nation Unity and Civil Protection agency is selected as the main agent for fire information system the coordination function for disaster management is misinterpreted. In addition the role of the Environmental Agency is not recognised or not known especially at the district level. This demonstrates that at the district level there is lack of information and knowledge about the actual and current political and legal state of affairs in terms of fire management in particular but also in terms of roles and functions of the civil service agencies in general. Although the decentralisation process has brought higher responsibility for the delivery of public services to the regions and in this respect the regions have the discretion to determine their organisational structures, this process should be always in line with the given national and provincial (fire and disaster management) framework. This shall ensure that the organisational structures are always used for coordination and communication of information and decisions and that these standard procedures are consistent. This is an on-going process of institutional diversification and modification, which shall become part of the fire management master plan for the province and districts.



The governmental agencies for fire information require (long-term) advice, support (training) and guidance in dealing with, understanding and applying fire management and the related activities of compiling, analysing, and applying fire information. The long term effort should be to support a clear concept of the use and application of fire information and its related technology for fire management and respectively land use planning to develop and support institutional structures and mechanisms. As a result land management agencies tasked with fire and land management will know when to take the necessary actions for fire management and the combat of associated problems. Decentralisation raises the question what capacities are needed at the various levels to make a fire information system work.

5.1 Main recommendations

- Constantly socialise the concept of fire management and its five components to ensure a common understanding among all stakeholders and participants in a fire management and information system. This includes the socialisation of the existing legislation for fire management and disaster management.
- Capacity building including training in the use and application of fire information should be based upon the agreed roles of the main fire agencies (Environmental agency and forestry department) at provincial and district level. They have to be in line with the national fire policy, hence avoid overlapping tasks and functions and support good governance. Based on this one should promote the environmental agency as the main agent for managing a fire information system and define and plan for the necessary / appropriate type of staff (civil servant) for the district and provincial level to carry out the (new) responsibility/task of fire management and of fire information in particular. This implies the need to continue the discussion at the district level to identify the main agency for fire information.
- Support the Regional Planning Agency (Bappeda) as the main agent for spatial regional land use planning. Assist them to build up a GIS data base for land use/cover including infrastructure, settlements. Raise awareness of the quality and actuality problem of these data amongst the land management agency.
- On the basis of the workshop results develop a comprehensive fire information plan in on-going workshops and meetings. The plan



must meet the specific needs of the stakeholders and must identify the methods of communication and coordination.

- Introduce a standard fire report system (e.g. the example of East Kalimantan, annex 5 or examples from the fire brigades “Manggala Agni”).
- Existing fire information such as hotspots, FDRS etc. should be thoroughly introduced and advantages/disadvantages shown to the selected players and users at district and provincial level. Training should be given on how to use such information in the daily routine of fire management, however not duplicating services already available.



Appendix 1

Terms of References



Development of Fire Information System

Background

- [Fire history in South Sumatra and objective of SSFFMP]
- [Activity 4.2 of SSFFMP Annual Work Plan 2004]
- Many efforts have been made to develop a sophisticated system for fire early warning and detection in Indonesia. Unfortunately this ended up very often with the distribution problems to the district and field level. No clear task and responsibility of certain institution are the main common problem in fire management in Indonesia and South Sumatra Province particularly.
- Clear and locally adapted concept of Fire Information System is required to support effective fire management.
- The international expert will conduct analysis of the needs and stakeholders of fire information and to develop the concept of Fire Information System in the province and SSFFMP priority districts. The expert will work closely with GIS/ Land Use Planning (GIS/LUP) and Remote Sensing/GIS (RS/GIS) experts.

Main Task

- Identify, analyse, formalize and describe the existing and potential fire information type, users, and responsible institution for acquiring, processing, and disseminating of fire information as well as communication means that allows effective flow of information.
- Produce a blueprint for fire information system at province, district and village level, which includes distribution system, type of required information and proposed assigning responsibilities to specific institutions.
- Together with Fire Management (FM) Expert develop Readiness Levels for specific Fire Danger Rating in the South Sumatra Province.
- Together with RS/GIS, GIS/LUP and FM expert, socialize the blueprint to the province and district level through meetings or seminars

Duration and Time Period

- The expert shall cover the tasks within 1 person month (1 pm).
- The assignment should be concluded within the period July – September 2004.

Results and Outputs

- Produce matrixes or diagrams which show the relationship between stakeholders in the province and district level; information products according to different needs (e.g. fire management, LUP); access and flow of fire information and possible media for fire information dissemination.
- *SOP for Readiness Levels.(change.....?)*
- Produce Reports & Deliverables, as described under Reporting Requirements & Deliverables

REPORTING REQUIREMENTS & DELIVERABLES:

- The consultant will submit a draft report, comprising the major findings and recommendations and according to the format which will be agreed upon with the Team leader, to the SSFFMP Project Management Unit (PMU) / Teamleader in electronic and printed version during the final week of



the consultancy visit. The draft report will be discussed with the PMU prior to the end of the consultancy visit.

- The final report in electronic and printed (6 pcs.) version, incorporating comments from the PMU, will be submitted to the PMU, within two weeks after completion of the assignment in Indonesia. Additionally, Time Sheets will be submitted to PMU before the completion of the assignment.
- An electronic and 1 printed version of the final report and a printed version of the Time Sheets will be submitted together with the final invoice to Michaela Haaser, GTZ IS Eschborn.
- Deliverables
 - Presentation of Approach & Results in any type of media / software application
 - Any equipment readings, photo's, video's, samples



Appendix 2

Fire Information System of East Kalimantan



FIRE INFORMATION SYSTEM

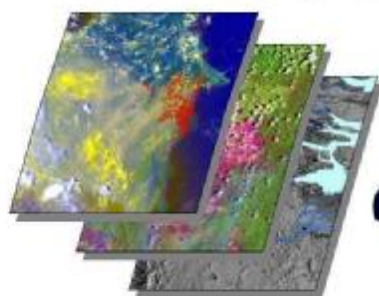
For a Developing Fire Management Organization

Integrated Forest Fire Management Project, East Kalimantan, Indonesia

Lenny Christy*, Redhahari*, Andi Zafryuddin*, Arpani*, Luluk Apitiah* & Anja A. Hoffmann*

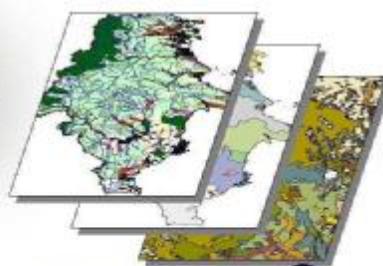
The Integrated Forest Fire Management Project (IFFM), a cooperative development project under bilateral agreement between Indonesia and Germany, is establishing a fire management system for the Province of East Kalimantan. IFFM is under the responsibility of the Ministry of Forestry and is implemented by the provincial forestry department. The IFFM concept consists of three modules that include fire prevention, fire operations and fire information. The Fire Information System (FIS) is a computer-supported system integrating fire-related data and information to support fire management decisions.

Data Input



Remote Sensing:

- NOAA-AVHRR (National Oceanic Atmospheric Administration-Advanced Very High Resolution Radiometer) Satellite 12 and 14 data are used for daily Hotspot detection and monitoring.
- Landsat Thematic Mapper data is the basis for detailed vegetation information.
- Synthetic aperture radar (SAR) data from the European Remote Sensing Satellite (ERS) allow mapping and assessing burned areas.



GIS Layer:

- Administrative boundaries, land use, vegetation and infrastructure data are base line data sets for mapping and statistical analysis.



Weather Data:

- Daily rainfall and daily maximum temperature are used for calculating Fire Danger Rating (FDR) Indices based on the Keetch-Byram drought code.



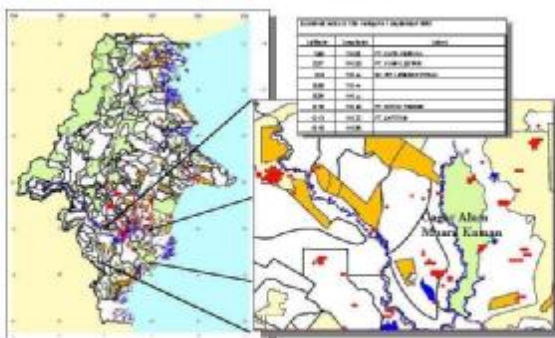
Fire Equipment Database:

- Private institutions and government agency equipment inventories are periodically up-dated.

Process & Analyze

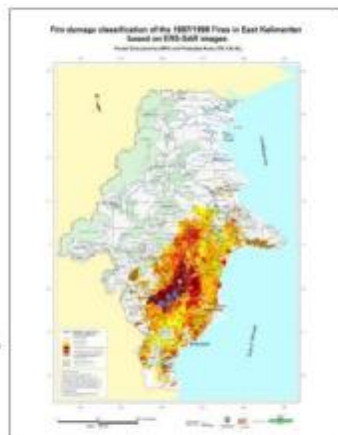
A range of data sources are processed and analyzed by the Fire Information System to support prevention, suppression and fire management policy development.

Fire Monitoring & Assessment



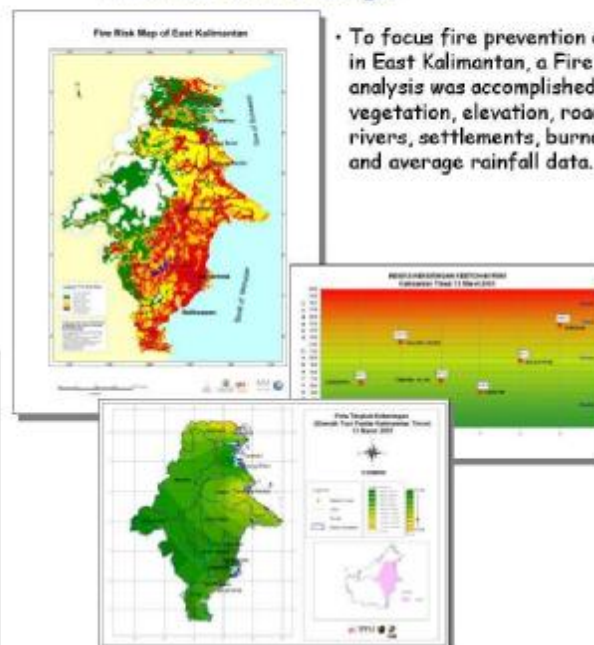
- Fire detection capabilities are currently limited to the use of NOAA Hotspot data. Combining this data with land ownership/status information, law enforcement and suppression actions can be focused.

- ERS-SAR data indicated that 5.2 million ha (25% of East Kalimantan) were burned in 1997/98.
- Damage classification results showed: 24% of the burned area had moderate fire damage, 42% had severe fire damage and 34% had complete fire damage.



Data Output

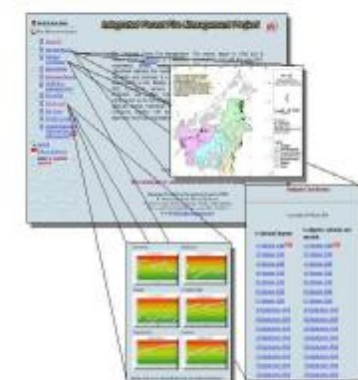
Fire Risk & Fire Danger



- To focus fire prevention efforts in East Kalimantan, a Fire Risk analysis was accomplished using vegetation, elevation, roads, rivers, settlements, burned area and average rainfall data.

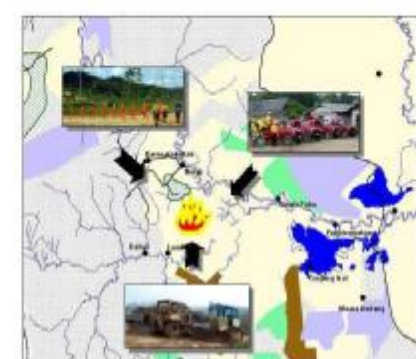
- Fire Danger Rating indices from six locations within the province are the basis for initiating fire readiness levels and intensifying fire prevention and awareness campaigns. FDR indices range from low, medium, high to extreme and are most applicable during extended dry periods.

Information Distribution



- Fire Information Output Data is posted and regularly up-dated on the IFFM homepage (www.iffm.org). In addition, FDR and Hotspot data are directly transmitted to all relevant stakeholders.

Fire Suppression Mobilization



- Access routes, water sources, closest available suppression resources and logistical support from government and private institutions are identified to efficiently coordinate suppression efforts.

Figure 4: Fire Information System of East Kalimantan



Appendix 3

Determination of Readiness Levels, Example of East Kalimantan



Readiness Levels Provincial and District Forest and Land Fire Management Agency Example East Kalimantan, Indonesia

Readiness Levels describe the existing state of alertness and preparedness of the fire management organization. Readiness Levels are based on six elements that include:

- ◆ Fire Danger Rating
- ◆ Weather Forecast
- ◆ NOAA Hotspots
- ◆ Smoke/Haze Conditions
- ◆ Fire Activity Reported by Districts
- ◆ Firefighting Resource Availability in Districts

The Fire Information Section compiles the data for these elements. On a weekly basis fire managers from all sections of the Provincial Fire Management Agency evaluate these elements using professional judgment to assess the current fire situation. The Readiness Level Analysis Form is a guide to assist fire managers in their evaluation of these elements and to determine a Readiness Level for each District and/or the Province. The result of this assessment can be used to provide information/ recommendations to political officials, agencies, and institutions as well as specific procedural direction to Local Fire Center's and other land management agencies. Following is a description of the process for assessing Readiness Level.

Prior to public release, evaluate all the information from the Weekly Fire Situation Report.

In Table 1, use an "X" to indicate the current condition of the following elements (use Table 3 as a guideline).

Total the point score for Table 1. (If 4 or more elements rate Low, Final Readiness Level is automatically scored as Normal.)

Indicate the appropriate Readiness Level in Table 2.

Include the Readiness Level in the public release of the Weekly Fire Situation Report and list the necessary actions.

Table 12: Readiness Level Elements and Evaluation Table

Element (Point score)	Low (1)	Moderate (2)	High (3)	Extreme (4)
1. Fire Danger Rating	X			
2. Weather Forecast	X			
3. NOAA Hotspots	X			
4. Smoke/Haze Conditions	X			
5. District Fire Activity	X			
6. Resource Availability	X			

SubTotal Point Score 6



Table 13: Final Readiness Level Determination

Readiness Level	I	II	III	Normal
Total Point Score	(19+)	(13-18)	(6-12)	4 or more Lows
Indicate Final Score				X

Table 14: Guidelines for Evaluating Readiness Level Elements

Element (Point score)	Low (1)	Moderate (2)	High (3)	Extreme (4)
1. Fire Danger Rating	Low	Moderate	High	Extreme
2. Weather Forecast	Steady or periodic rain predicted	Occasional showers	Dry	Continued drying
3. NOAA Hotspots	Less than 10	11-20	21-60	60+
4. Smoke/Haze Conditions	Clear	Occasional morning haze	Afternoon haze	Visibility impaired
5. District Fire Activity	No Fires	Occasional fires	Regular occurrence	Numerous and widespread
6. Resource Availability	No use	Occasional use	Steady use	Personnel shortages experienced

Readiness Level Actions

Normal Conditions

1. No patrols or tactical detection necessary
2. Ensure all suppression equipment is “fire ready”
3. Continue fire prevention awareness/education programs
4. Planning and budgeting activities predominate
5. Vegetation fires suppressed if threaten specific resource values/ improvements

Readiness Level III

1. Patrols or tactical detection performed as needed by local conditions
2. Ensure all suppression equipment is “fire ready”
3. Begin “targeting” fire prevention programs to “risk” areas
4. Begin annual refresher training for fire suppression staff
5. Vegetation fire suppressed if threaten specific resource values/ improvements

Readiness Level II

1. Patrols and tactical detection occur minimum 5 days per week
2. Slip-on Engines and pick-up trucks fully equipped with initial attack equipment
3. Initial attack on accidental fires or fires that escape pre-planned boundaries should be occurring
4. Focus fire prevention programs to areas where fires are occurring and other “high risk” areas



5. Begin intensive fire prevention media campaigns (TV,radio,newspaper)
6. Advise political leaders on possible need for “burning ban” if conditions worsen

Readiness Level I

1. Implement Standard Operating Procedures for “High & Extreme Fire Danger”
2. Patrols and detection occur 7 days per week
3. All LFC staff should be available for fire assignments or supporting efforts
4. All vegetation fires must be suppressed
5. Governor/Bupati’s must consider issuing a “Burning Ban”



Appendix 4

Fire bulletin of East Kalimantan



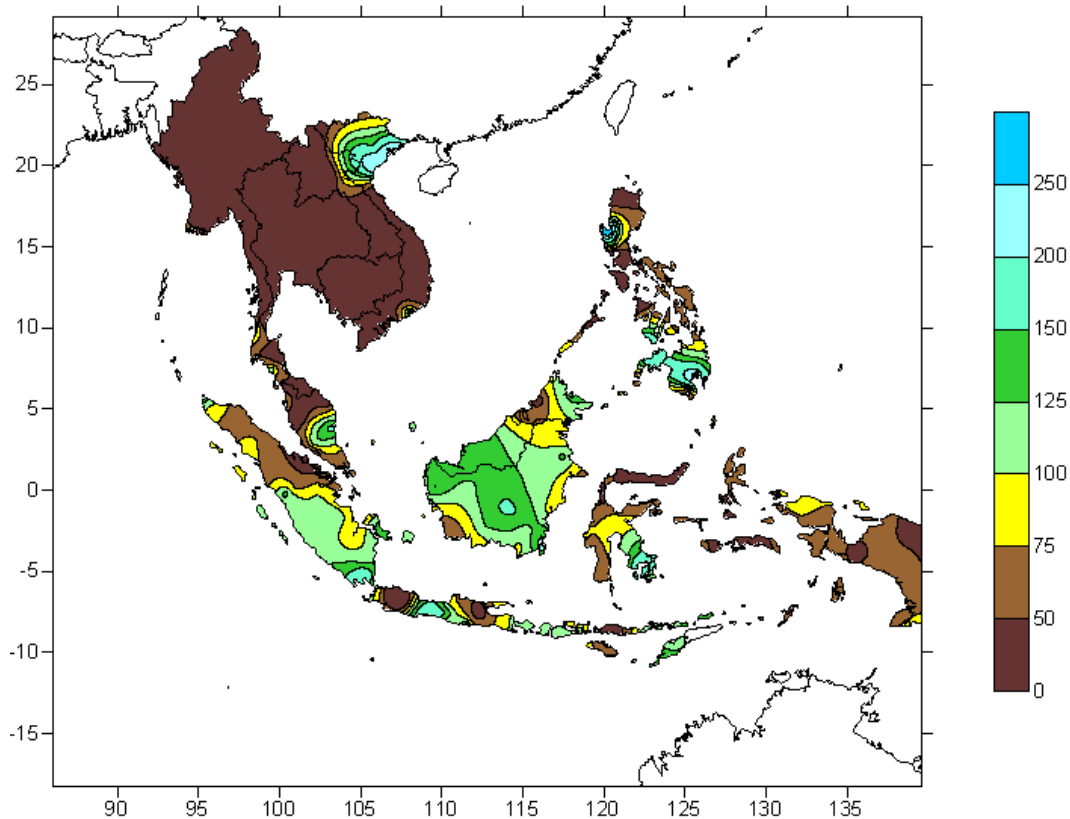
Terbit: 18 Januari 2005

Oleh: UPTD PKHL
(Unit Pelaksana Teknis Dinas
Pengendalian Kebakaran Hutan dan
Lahan)
Komp. Perkantoran Dinas Kehutanan
Prop. Kaltim
Jl. Harmonika Tlp. 0541 732625
Fax 0541 733519
E-mail: uptd_pkh@samarinda.org
<http://www.pkh.or.id>

Mingguan Info Situasi Kebakaran

18 Januari 2005

Percent of Normal Precipitation for December 2004
(Based on Preliminary Data Received)



Terbit: 18 Januari 2005

Oleh: UPTD PKHL
(Unit Pelaksana Teknis Dinas
Pengendalian Kebakaran Hutan dan
Lahan)
Komp. Perkantoran Dinas Kehutanan
Prop. Kaltim
Jl. Harmonika Tlp. 0541 732625
Fax 0541 733519
E-mail: uptd_pkh@samarinda.org
<http://www.pkh.or.id>

Mingguan Info Situasi Kebakaran



Daftar Informasi:

- ☑ Halaman muka : presentase curah hujan pada bulan Desember 2004
- ☑ Table Ringkasan Informasi Bulletin (Table 1)
- ☑ Tabel Tindakan Tiap Tingkat Siaga sesuai SK. Gubernur Kalimantan Timur Nomor : 522/K.130/2003 tanggal 29 April 2003 (Tabel 2)
- ☑ Indeks Tingkat Bahaya Kebakaran saat ini (1 – 16 Januari 2005) dari enam lokasi di Propinsi Kalimantan Timur: Nunukan, Tanjung Selor, Tanjung Redeb, Tarakan, Samarinda dan Balikpapan (Gambar 1 – 6).
- ☑ Rata-rata Indeks Tingkat Bahaya Kebakaran dari enam lokasi di Propinsi Kalimantan Timur (Gambar 7 ; harap diperhatikan bahwa keenam lokasi sumber data berada di sepanjang pesisir Kaltim sehingga tidak representatif terutama untuk bagian barat dan barat laut Propinsi Kaltim).
- ☑ Peta Hotspot Kalimantan Timur yang terdeteksi oleh satelit NOAA-AVHRR tgl. 11 s.d. 17 Januari 2005 (Gambar 8).
- ☑ Tabel Daftar Koordinat titik hotspot KALTIM (Tabel 3).
- ☑ Arah angin dan tutupan asap regional/ titik panas di daerah yang bebas awan (Gambar 10)
- ☑ Peta Temperatur (Gambar 17)
- ☑ Peta Kelembaban Relatif (Gambar 18)
- ☑ Peta Durasi Sejak Turunnya Hujan (Gambar 19)
- ☑ Tabel Prediksi Cuaca tujuh hari yang akan datang tanggal 18 – 24 Januari 2005 untuk Kabupaten/Kota di Propinsi Kaltim (Tabel 4)
- ☑ Daftar situs yang menyediakan informasi yang terkait dengan kebakaran hutan (Table 5)



Catatan Singkat

Indeks Tingkat Bahaya Kebakaran

Berdasarkan informasi terakhir yang kami terima dari BMG Balikpapan (01 - 16 Januari 2004) dari enam lokasi dimana data cuaca diperoleh yaitu, wilayah **Nunukan** berada pada tingkat bahaya kebakaran **Tinggi**, Sementara wilayah **Samarinda** berada pada tingkat bahaya kebakaran **Menengah**, wilayah Balikpapan, Tarakan, Tanjung Redep (Berau) dan Tanjung Selor (Bulungan) berada pada tingkat Rendah (Lihat gambar 1-6, FDR). Secara rata-rata, Indeks Tingkat Bahaya Kebakaran berada pada tingkat **Menengah** (Lihat gambar 7, Rata – rata 6 stasiun cuaca)

Hotspots

Berdasarkan hasil pantauan citra satelit NOAA 12 & 16 AVHRR yang diperoleh dari Meteorologi Services Division, NEA Singapore pada tanggal 11 s.d. 17 Januari 2004, tidak terdeteksi hot spot di wilayah Kalimantan Timur.

Laporan dari Kabupaten/Kota

- Kabupaten/kota melaporkan bahwa diwilayah mereka masih mengalami hujan beberapa kali dalam satu minggu, sehingga kondisi tanah cukup basah. Tidak ada laporan mengenai adanya kebakaran hutan atau lahan.

Arah Angin, Temperatur Udara, Kelembaban, dan Durasi sejak Turun Hujan

- Dari hasil pantauan Meteorological Services Division, NEA Singapore Arah Angin yang terliput pada minggu ini adalah untuk wilayah *Nunukan, Malinau, Tarakan, Bulungan, Berau dan Kutai Timur* hembusan angin berasal dari **Timur Laut**, Untuk wilayah *Bontang, Kutai Barat, Kutai Kartanegara, Samarinda* hembusan angin berasal dari arah **Barat Laut**, sementara wilayah *Balikpapan, Pasir dan Panajam Paser Utara* hembusan angin berasal dari arah **Barat Daya**, berdasarkan data yang diperoleh dapat dilihat bahwa pergerakan angin yang terjadi dalam minggu ini kurang lebih sama setiap harinya.
- Temperatur udara yang terpantau di wilayah Kalimantan Timur dalam minggu ini berkisar 24.3 - 34,5 °C (lihat gambar 15 ; Temperature).
- Tingkat kelembaban relatif di wilayah kalimantan timur umumnya sekitar 64.9% – 92.9% (lihat gambar 16 ; Relative Humidity).
- Peta Durasi sejak turun hujan untuk wilayah Kalimantan Timur mengalami hujan beberapa kali dalam minggu ini dengan intensitas yang berbeda disetiap wilayah. (lihat gambar 17 ; Durasi Sejak Turun Hujan).
- Jarak pandang wilayah Kalimantan Timur berada pada kondisi normal .

Status of El Nino



Berdasarkan hasil observasi dan prediksi terakhir dari International Research Institute dihasilkan bahwa kondisi El Nino Lemah telah berkembang di bagian Timur sampai dengan Tengah Tropical Pacific pada akhir July, dengan suhu permukaan laut 1° diatas rata-rata yang terobservasi di sepanjang equator dari 160° E hingga 160° W. Secara umum berdasarkan hasil model prakiraan dan observasi yang dilakukan pada suhu permukaan laut dan bawah permukaan laut kemungkinan terjadi El Nino diperkirakan mendekati 85% hingga Bulan Maret 2005, dan menurun sesudahnya. Kemungkinan kembali menjadi kondisi Netral adalah 15% hingga bulan Maret 2005.

Prediksi Cuaca

Berdasarkan informasi dan BMG – Balikpapan bahwa prediksi cuaca untuk tgl. 18 s.d. 24 Januari 2005 :

- Ø wilayah Kalimantan Timur pada umumnya berpotensi mengalami hujan ringan hingga sedang (curah hujan diperkirakan 0mm s.d. 30mm) di wilayah Nunukan dan Tarakan, Malinau, Berau, Bulungan, Bontang, Kutai Timur, dan Kutai Barat. Sementara Kutai Kartanegara, Balikpapan, Samarinda, Panajam Paser Utara dan Pasir berpotensi mengalami hujan sedang (curah hujan diperkirakan 30mm s.d. 60mm).
- Ø Arah angin di wilayah Kaltim bertiup dari arah Barat Laut dan Timur Laut dengan kecepatan antara 5 Knots.
- Ø Jarak Pandang diperkirakan Normal 4 – 10 Km.
- Ø Temperatur Udara diperkirakan berkisar antara $23 - 32^{\circ}$ C, serta Kelembaban udara diperkirakan 64% – 98%

(Tabel 4 ; Daftar Prakiraan Cuaca Mingguan di Wilayah Kalimantan Timur)

Status Siaga

Grafik FDR mengalami kecenderungan normal (turun – naik secara seimbang) setelah mengalami hujan beberapa kali pada enam lokasi stasiun cuaca yang terpantau (kecuali Samarinda). Tidak terdeteksi adanya hot spot di wilayah Kalimantan Timur. Prediksi cuaca untuk 7 hari yang akan datang diperkirakan akan mengalami hujan hampir di semua wilayah. Laporan yang masuk dari Kabupaten/Kota menyatakan masih turun hujan dengan intensitas cukup sedang. Berdasarkan data-data tersebut diatas dan setelah dilakukan analisa dan perhitungan maka dinyatakan status siaga untuk ***Propinsi Kalimantan Timur adalah Normal.***



Table 15: Ringkasan Informasi									
Wilayah	FDR 01- 16 Januari	Hotspot 11- 17 Januari	Laporan dari Kabupaten 11- 17 Januari	Ramalan Cuaca 18 - 24 Januari	Tingkat Siaga				
					N	3	2	1	Catatan
Samarinda	Menengah	-	Kondisi hujan	Hujan	X				
Balikpapan	Rendah	-	Tidak ada Laporan	Hujan	X				
Tanjung Redeb/Berau	Rendah	-	Tidak ada Laporan	Hujan	X				
Tanjung Selor/Bulungan	Rendah	-	Tidak ada Laporan	Hujan	X				
Tarakan	Rendah	-	Kondisi hujan	Hujan	X				
Nunukan	Tinggi	-	Tidak ada Laporan	Hujan	X				
Kutai Timur	-	-	Tidak ada Laporan	Hujan					Belum bisa dihitung tingkat siaga karena tidak tersedianya data FDR
Kutai Kertanegara	-	-	Tidak ada Laporan	Hujan					Belum bisa dihitung tingkat siaga karena tidak tersedianya data FDR
Kutai Barat	-	-	Kondisi hujan	Hujan					Belum bisa dihitung tingkat siaga karena tidak tersedianya data FDR
Malinau	-	-	Tidak ada Laporan	Hujan					Belum bisa dihitung tingkat siaga karena tidak tersedianya data FDR
Pasir	-	-	Tidak ada Laporan	Hujan					Belum bisa dihitung tingkat siaga karena tidak tersedianya data FDR
Panajam PU	-	-	Tidak ada Laporan	Hujan					Belum bisa dihitung tingkat siaga karena tidak tersedianya data FDR
Bontang	-	-		Hujan					Belum bisa dihitung tingkat siaga karena tidak tersedianya data FDR
Rata-rata 6 Wilayah	Menengah	-	-	Hujan					

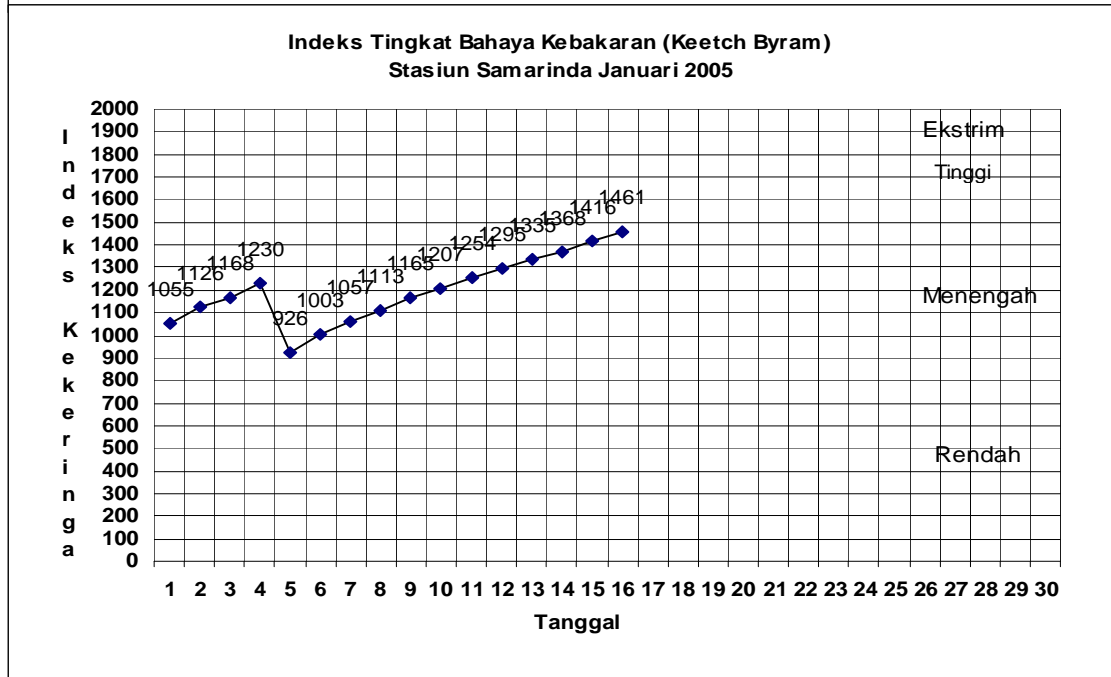
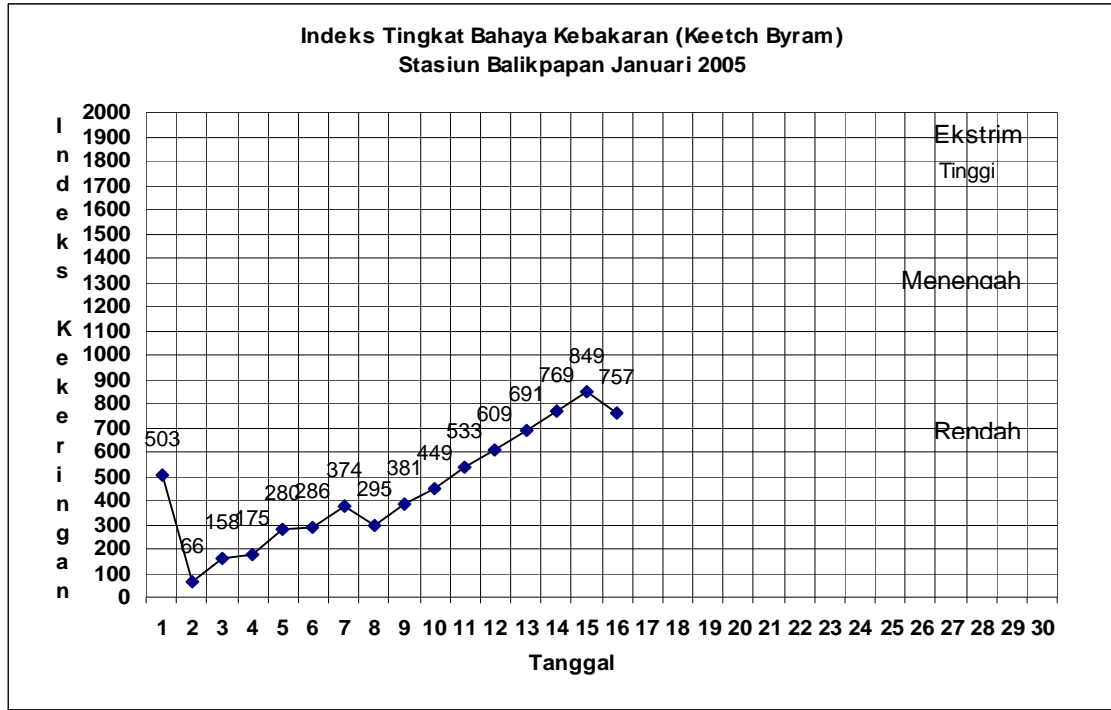
Tabel 1: Ringkasan Informasi FDR, Hotspot, Ramalan Cuaca dan Tingkat Siaga



Tindakan pengelola hutan dan atau lahan / organisasi yang diberi wewenang dalam pengelolaan kebakaran hutan/lahan pada tiap Kriteria Siaga sesuai dengan SK. Gubernur Kalimantan Timur NOMOR : 522/K.130/2003 TANGGAL 29 APRIL 2003, sebagai berikut :

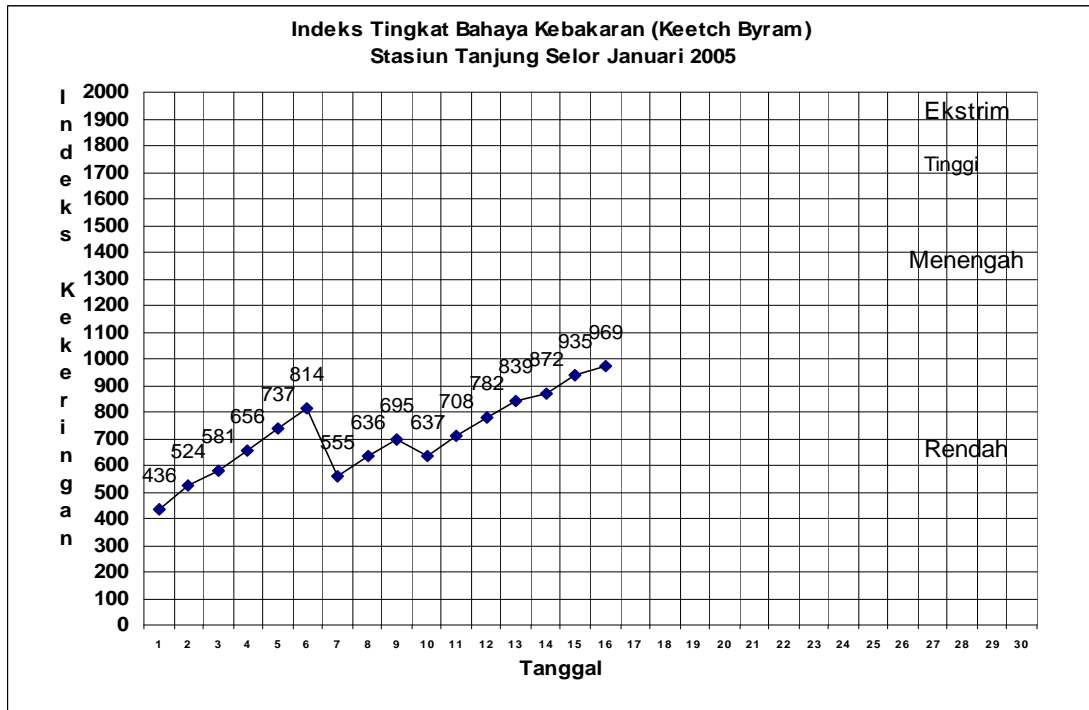
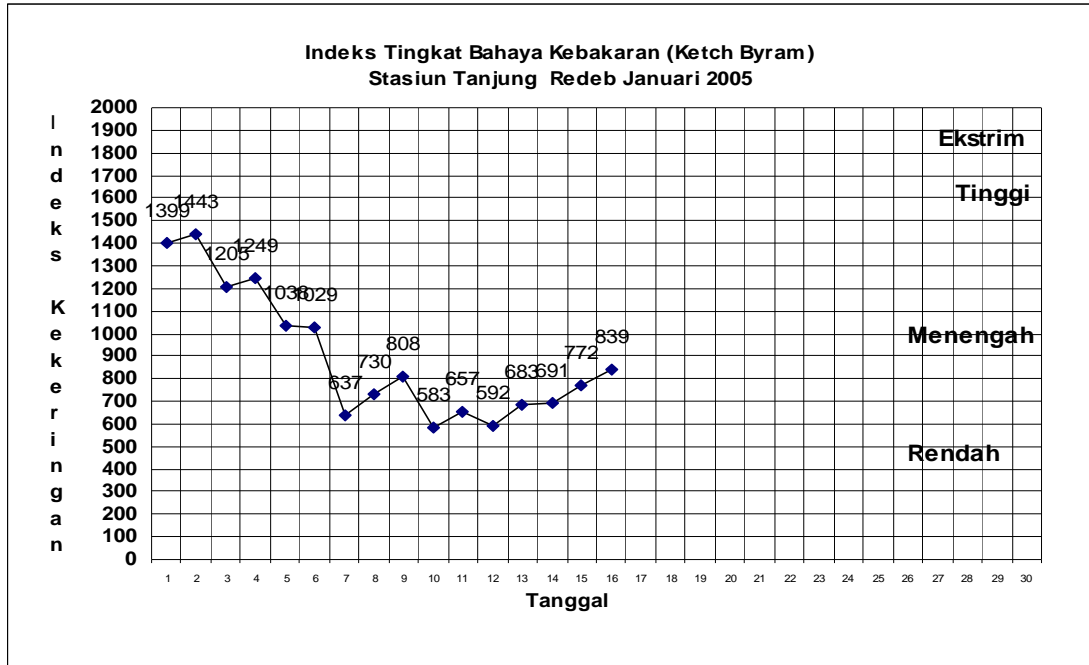
Table 16: Tindakan Tiap Tingkat Siag

NORMAL	SIAGA III	SIAGA II	SIAGA I
<ol style="list-style-type: none"> 1. Tidak diperlukan patroli atau pendeteksian langsung dilapangan. 2. Memastikan semua peralatan pemadam siap dipergunakan. 3. Pelaksanaan program penyadaran untuk pencegahan kebakaran hutan dan lahan. 4. Melakukan kegiatan pelatihan penyegaran untuk staf pemadam kebakaran. 5. Memonitor, mengevaluasi dan mengelola seluruh informasi dan laporan mengenai / tentang kebakaran hutan dari Kabupaten/Kota. 	<ol style="list-style-type: none"> 1. Patroli / deteksi taktis dilakukan apabila diperlukan, tergantung pada kondisi lokal 2. Memastikan semua peralatan dan personil pemadam siap digunakan. 3. Melaksanakan kegiatan penyadaran (sosialisasi / kampanye / penyuluhan) pada daerah-daerah rawan kebakaran hutan & lahan. 4. Mempersiapkan posko kebakaran hutan & lahan serta menyebarluaskan nomor telepon, faximile & nama-nama petugas (Koordinator) yang dapat dihubungi di masing-masing daerah. 	<ol style="list-style-type: none"> 1. Melakukan patroli dan deteksi lapangan minimal 5 hari per minggu 2. Meningkatkan jumlah peralatan pemadam kebakaran & personil yang ditugaskan di lokasi kebakaran 3. Menfokuskan program pencegahan kebakaran pada daerah yang memiliki tingkat resiko kebakaran tertinggi 4. Melakukan kampanye/ penyuluhan / penyebarluasan informasi bahaya kebakaran hutan & lahan melalui media cetak dan media elektronik. 5. Pimpinan Daerah mempertimbangkan untuk mengeluarkan larangan sementara pembakaran/penyiapan lahan. 6. Melakukan koordinasi dan pemadaman kebakaran hutan serta lahan secara terpadu 	<ol style="list-style-type: none"> 1. Melakukan patroli dan deteksi lapangan setiap hari per minggu. 2. Menyiagakan posko kebakaran hutan dan lahan selama 24 jam per hari 3. Melakukan pemadaman kebakaran hutan dengan menggunakan seluruh peralatan dan personil. 4. Mengerahkan seluruh personil dan staf pendukung yang tersedia dengan melibatkan masyarakat. 5. Meningkatkan koordinasi dan mobilisasi seluruh sumber daya secara terpadu 6. Pimpinan Daerah mengeluarkan larangan pembakaran pada penyiapan lahan.



Sumber : BMG Balikpapan

Keterangan :
 0 - 1000 = Rendah
 1000 - 1500 = Menengah
 1500 - 1750 = Tinggi
 1750 - 2000 = Ekstrim



Sumber : BMG Balikpapan

Keterangan :

- 0 - 1000 = Rendah
- 1000 - 1500 = Menengah
- 1500 - 1750 = Tinggi
- 1750 - 2000 = Ekstrim

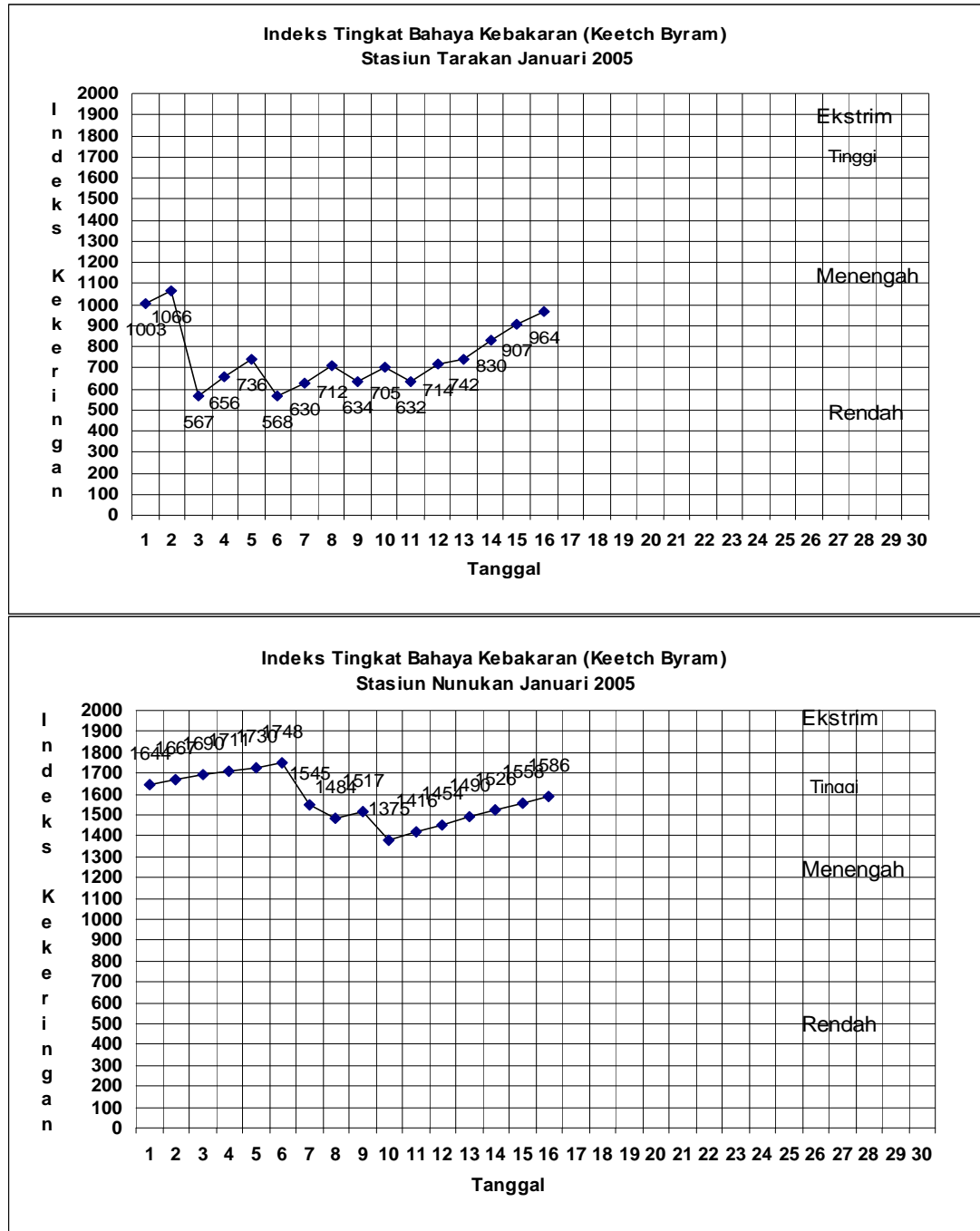


Figure 5: FDR stasiun Kaltim

Sumber : BMG Balikpapan

Keterangan :
 0 - 1000 = Rendah
 1000 - 1500 = Menengah
 1500 - 1750 = Tinggi
 1750 - 2000 = Ekstrim



Indeks Tingkat Bahaya Kebakaran (Keetch Byram)
Rata-rata 6 Stasiun Januari 2005

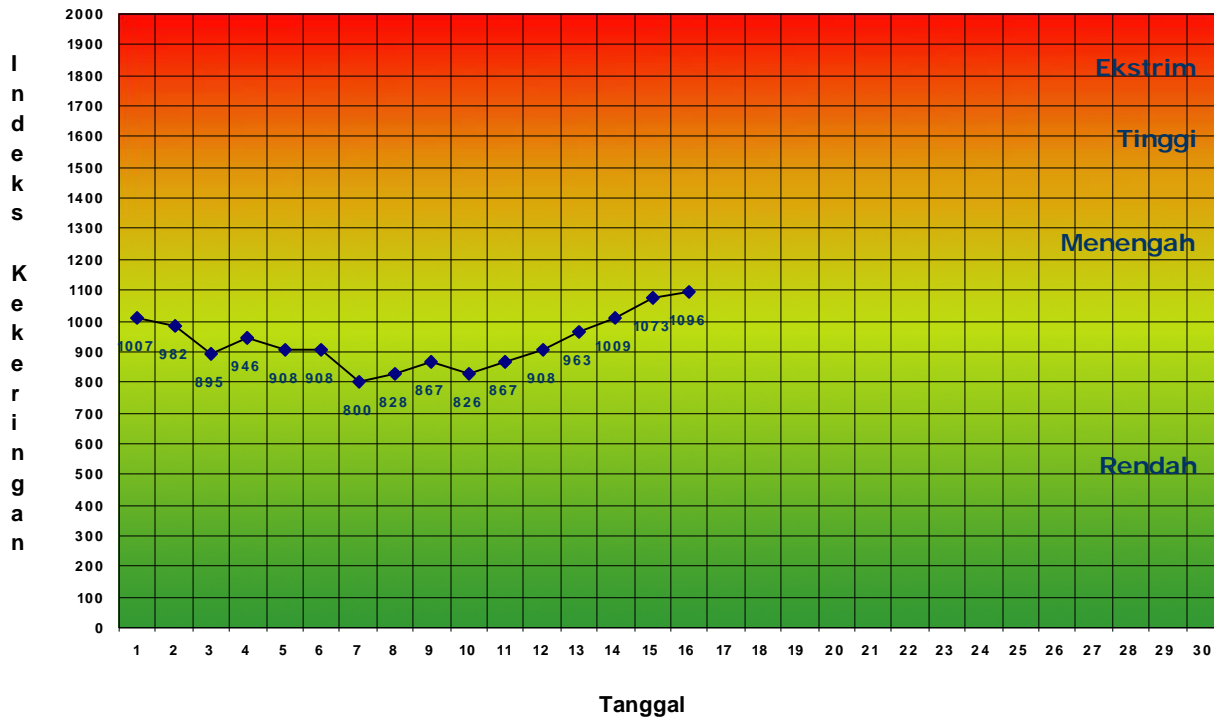


Figure 6: Grafik rata-rata Indeks Tingkat Bahaya Kebakaran dari 6 stasiun

Sumber : BMG Balikpapan

Keterangan :

- 0 - 1000 = Rendah
- 1000 - 1500 = Menengah
- 1500 - 1750 = Tinggi
- 1750 - 2000 = Ekstrim

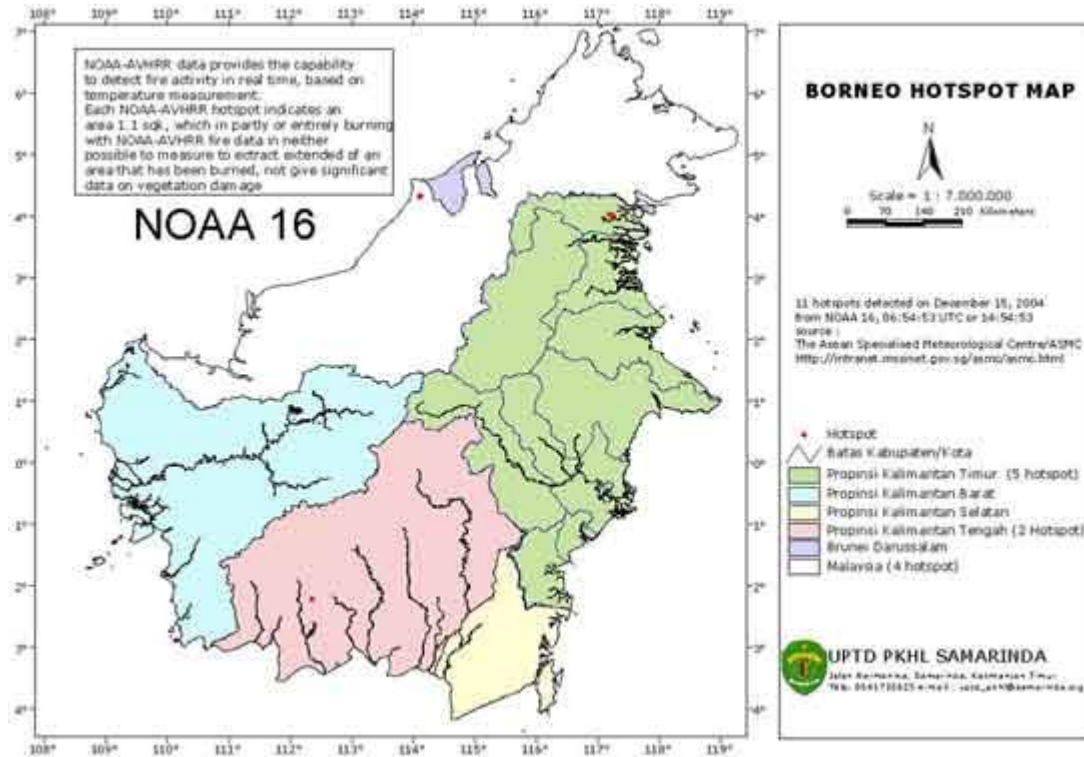


Figure 7: Gambar 8 : Peta Hotspot Kaltim (contoh bulan December)

Sumber : UPTD PKHL - Meteorological Services Division, NEA

Prakiraan koordinat titik hotspot pada tanggal ----- :

LONGITUDE	LATITUDE	NEGARA/PROPINSI KABUPATEN/KABUPATEN	KETERANGAN
114.11	4.31	Malaysia	Satellite: NOAA16
114.10	4.30	Malaysia	Date & Time: 2004/12/15 06:54:53 UTC
114.11	4.30	Malaysia	Total Hotspot Count in Pixel: 11
114.12	4.31	Malaysia	Total Hotspot Count in Group: 4
117.20	4.02	Kalimantan Timur	Nunukan
117.20	4.01	Kalimantan Timur	Nunukan
117.26	3.99	Kalimantan Timur	Nunukan
117.24	4.00	Kalimantan Timur	Nunukan
117.23	4.00	Kalimantan Timur	Nunukan
112.36	-2.23	Kalimantan Tengah	

Table 17: Koordinat Hotspot Terdeteksi di Kaltim

(Sumber : UPTD PKHL - Meteorological Services Division, NEA)

Catatan :Tidak setiap hari hot spot dapat di deteksi, yang disebabkan oleh sensor NOAA-AVHRR yang tidak dapat menembus awan tebal, citra yang terpotong atau kualitas citra yang kurang baik sehingga tidak dapat diproses.

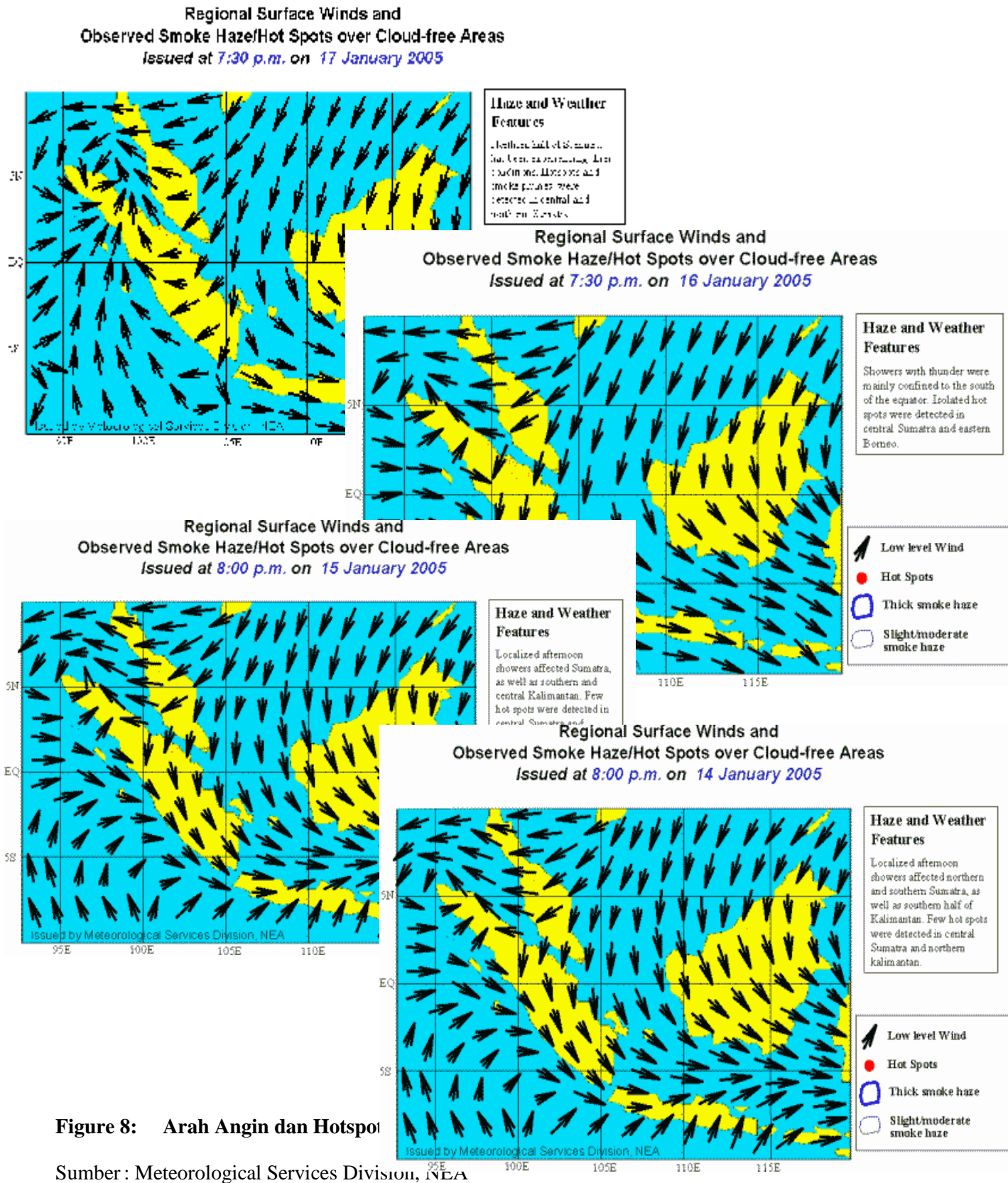


Figure 8: Arah Angin dan Hotspot

Sumber : Meteorological Services Division, NEA

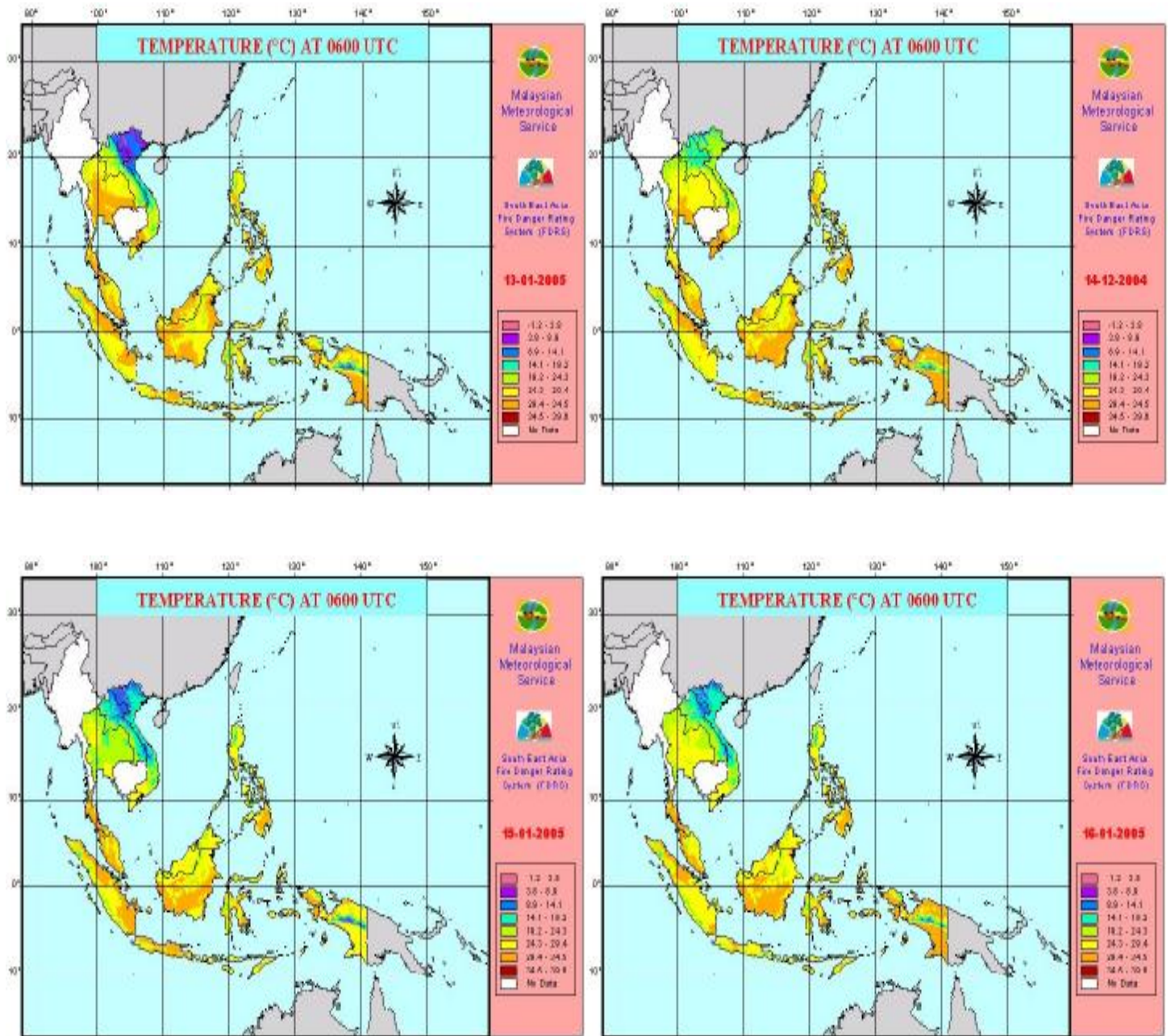


Figure 9: Peta Temperatur Udara

Sumber : Malaysian Meteorological Service

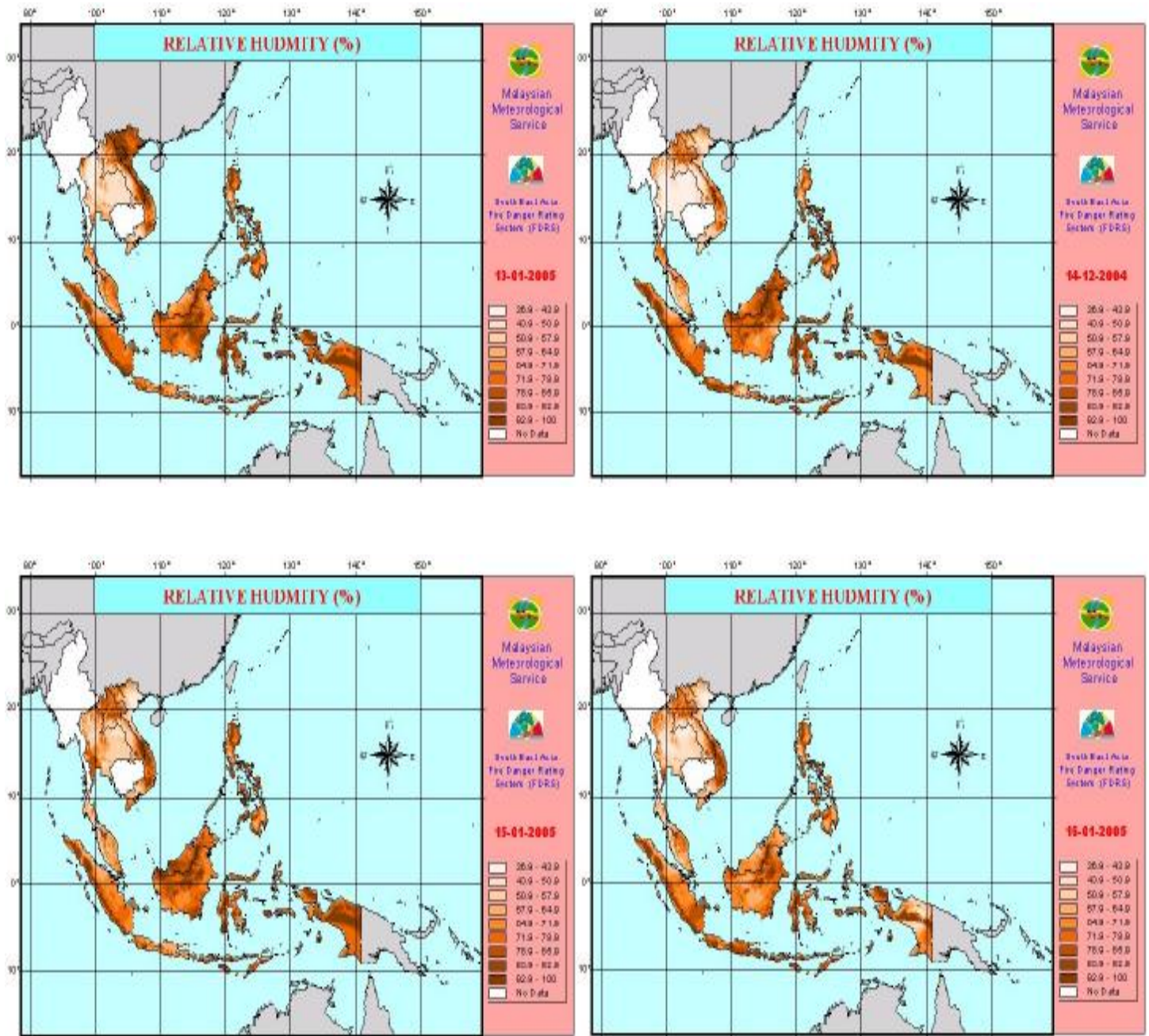


Figure 10: Peta Kelembaban Relatif

Sumber: Malaysian Meteorological Service

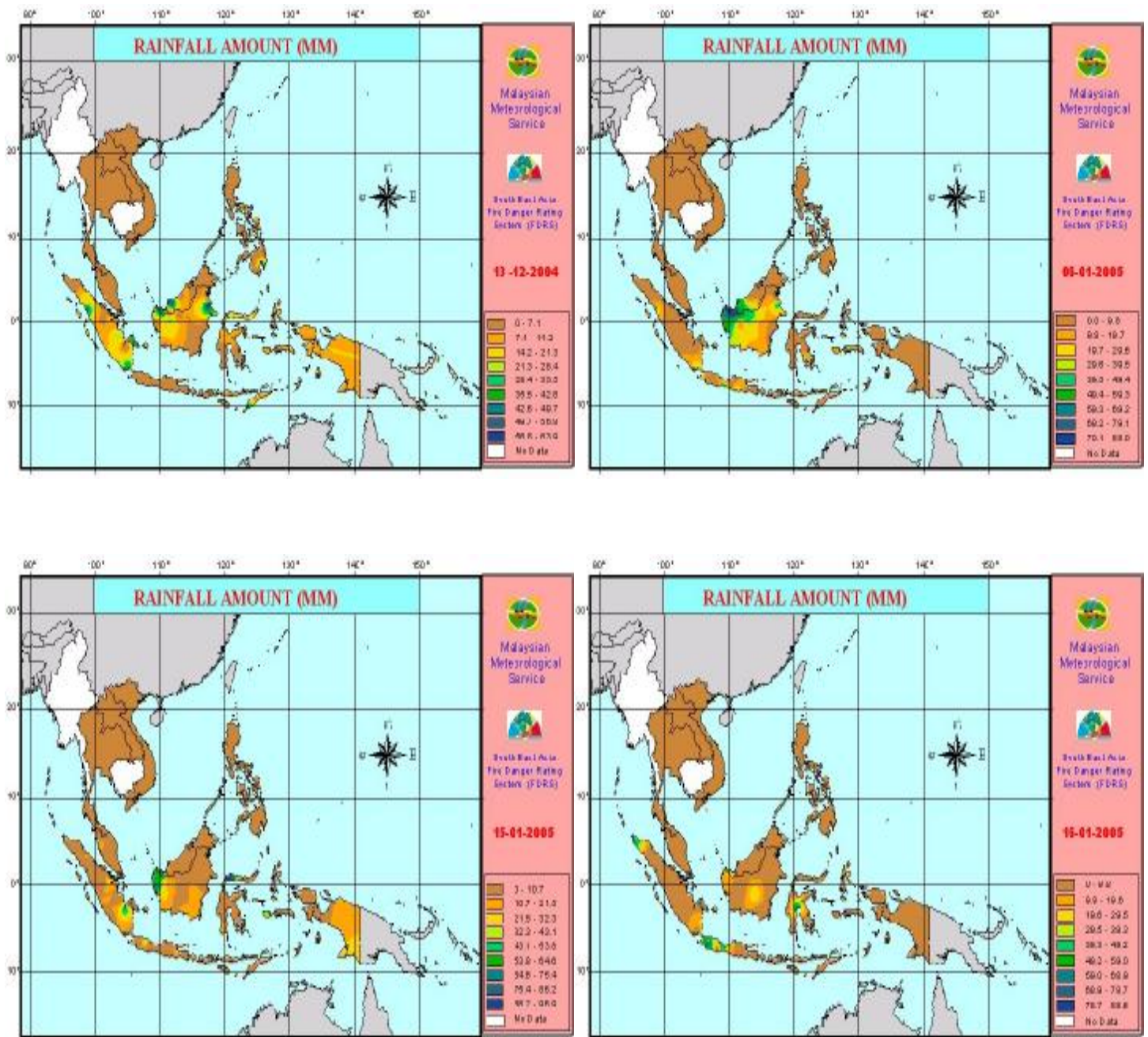


Figure 11: Peta Durasi Sejak Turun Hujan

Sumber : Malaysian Meteorological Service



PRAKIRAAN CUACA MINGGUAN WILAYAH KALIMANTAN TIMUR

TANGGAL 18 s.d. 24 Januari 2005

NO	KABUPATEN	ARAH/KECEP. ANGIN (KNOTS)	CUACA	JARAK PANDANG (KM)	SUHU (*C)	KELEMBABAN (%)	CURAH HUJAN (mm)	kalender HUJAN						
								18	19	20	21	22	23	24
1	NUNUKAN	NE 5	RA	6 - 10	23 - 31	65 - 95	10 - 30		x		x		x	
2	MALINAU	NE 5	RA	6 - 10	23 - 31	65 - 95	10 - 30				x		x	
3	TARAKAN	NE 5	RA	6 - 10	24 - 31	65 - 95	10 - 30		x			x		x
4	BULUNGAN	NE 5	RA	6 - 10	23 - 32	65 - 95	10 - 30			x		x		x
5	BERAU	NE 5	RA	6 - 10	23 - 32	65 - 96	10 - 30	x		x		x		x
6	KUTAI TIMUR	NE 5	RA	6 - 10	23 - 31	65 - 98	10 - 30	x		x	x			x
7	BONTANG	NW 5	RA	6 - 10	23 - 31	65 - 98	10 - 30	x			x			x
8	KUTAI BARAT	NW 5	RA	6 - 10	23 - 30	65 - 98	10 - 30	x	x	x			x	x
9	KUTAI KARTANEGARA	NW 5	RA	4 - 9	24 - 31	65 - 98	10 - 50	x	x	x		x	x	
10	SAMARINDA	NW 5	RA	4 - 9	24 - 31	65 - 98	30 - 50	x	x		x	x		x
11	BALIKPAPAN	NW 5	RA	4 - 8	24 - 31	65 - 99	30 - 60	x	x		x	x		x
12	PENAJAM PASER UTR	NW 5	RA	4 - 8	24 - 31	64 - 98	30 - 60	x	x	x	x		x	x
13	PASIR	NW 5	RA	4 - 8	24 - 31	64 - 98	30 - 60	x	x	x	x	x	x	x

KETERANGAN :

HZ (haze) udara kabur yang disebabkan oleh partikel padat

RA (Rain) hujan

NE (North East) = Timur Laut

N (North) = Utara

FU=Smoke

TS=Guntur

Table 18: Daftar Prakiraan Cuaca Mingguan Wilayah Kalimantan Timur
Sumber : Badan Meteorologi dan Geofisika - Balikpapan



Table 19: Daftar Situs dengan Informasi Hotspot, Ramalan Cuaca, El-nino

Tabel Situs Informasi	
Meteorological Services Division, NEA	Informasi arah angin, kabut/asap, citra NOAA
Malaysian Meteorological Service	Informasi beserta peta Temperature, Humidity, Precipitation.
www.haze-online.or.id	Informasi artikel tentang kabut asap yang terjadi
www.bmq.go.id	Informasi meteorology, kabut/ asap, peta arah angin
www.lapanrs.com	Informasi cuaca, kabut/asap, hotspot.
www.pmel.noaa.gov/tao/elnino/	Informasi El nino
www.elnino.noaa.gov/	Informasi El nino
www.wmo.ch/	Informasi El nino
www.cpc.ncep.noaa.gov/product/analysis_monitoring/enso_update/index.html	Informasi El nino



Appendix 5

Fire report form (example of East Kalimantan)



DINAS KEHUTANAN PROPINSI KALIMANTAN TIMUR, BALAI PKHL Fire Report	1. Province	4. Fire Name
	2. District	5. Started on (day, month, year)
	3. Sub-District	6. Forestry Office (LFC, CDK)
Date	Hour	
7. Cause	26. Non-commercial Forest	
8. Discovered	27. Natural Commercial Forest	
9. First Attack	28. Plantation Commercial Forest	
10. First Reinforcements	29. Non-Forest	
11. Fire Controlled	30. Volume of Timber Burned (Destroyed)	
12. Fire Out	31. Latitude of Origin	
13. Discovered by	32. Longitude of Origin	
14. First Attack (Number of People & Equipment)	Sketch Map	
15. First Reinforcements (Number of Personnel & Equipment)		
16. Maximum Number of Personnel Used		
17. Maximum Number of Equipment Used		
18. Temperature & Relative Humidity		
19. Fire Danger		
20. Slope		
21. Aspect		
22. Elevation		
23. Topography		
24. Total Burned Area		
25. Prevailing Fuel Type on Burned Area		
Remarks:		
Submitted by (Signature)	Date	Approved by (Signature) Date