METI EKAYANI

COMPARISON OF DISCOURSES IN GLOBAL & INDONESIAN MEDIA AND STAKEHOLDERS' PERSPECTIVES ON FOREST FIRE

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Meti Ekayani

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GLOSSARY

AKECOP	=	ASEAN Korea Environmental Cooperation
ASEAN	=	Association of South East Asian Nations
BAPPEDA	=	*Badan Perencanaan Pembangunan Daerah,* Regional Development Planning Board
BKSDA	=	*Balai Konservasi Sumber Daya Alam,* Natural Resources Conservation Office
BLHD	=	*Badan Lingkungan Hidup Daerah*, Regional Environmental Board
BPDAS	=	*Badan Pengelola Daerah Aliran Sungai*, Watershed Management Board
BPK	=	*Buletin Penelitian Kehutanan*, Journal of Forestry Research – a National Journal
BPKH	=	*Balai Pemantapan Kawasan Hutan,* Forest Area Arrangement Office
CIFOR	=	Center for International Forestry Research
CJFR	=	Canadian Journal of Forest Research
DISHUT	=	*Dinas Kehutanan,* Forestry Service at province and regency
ENSO	=	El-Nino Southern Oscillation
FEM	=	Journal of Forest Ecology and Management
FORDA	=	Forestry Research and Development Agency
FS	=	Journal of Forest Science
GFMC	=	Global Fire Monitoring Center
HPH	=	*Hak Pengusahaan Hutan,* Forest Concession
HTI	=	*Hutan Tanaman Industri,* Timber Estate

ICRAF	= International Centre for Research on Agroforestry, World Agroforestry Centre
IFFN	= International Forest Fire News
IHT	= International Herald Tribune
INPA	= *Instituto Nacional de Pesquisas da Amazonia*
IPB University	= *Institut Pertanian Bogor,* Bogor Agricultural
JF	= Journal of Forestry
JMHT	= *Jurnal Manajemen Hutan Tropika,* Journal of Tropical Forest Management – a National Journal
KBT	= *Kemakmuran Berkah Timber,* a forest concession
KL	= *Kiani Lestari,* a forest concession
KLH	= *Kementerian Lingkungan Hidup,* Ministry of Environment
LATIN	= *Lembaga Alam Tropika Indonesia,* a National Environmental NGO
MoF	= Ministry of Forestry of the Republic of Indonesia
NRC	= National Research Council (Canada)
PERHUTANI	= State-Own Forest Enterprise in Java island
PK	= *Panca Karya*, a forest concession
SEAMEO BIOTROP Biology	= Southeast Asian Regional Centre for Tropical
TM	= Time Magazine
UNDAC Coordination	= United Nations Disaster Assessment and
UNEP	= United Nations Environmental Programme
UNMUL	= *Universitas Mulawarman,* University of Mulawarman at Samarinda East Kalimantan
WWF	= World Wildlife Fund

CHAPTER 1

INTRODUCTION

"FIRE IS a powerful symbol of chaos, often marking the destruction of order in both the social and the natural worlds" (Matthews 2003:1)

1.1 Forest Fire Discourses in Media

Media have important roles in directing opinions of the society as well as influencing policy-making processes of the government sector. Moreover, media can also be used as key socialization agents, particularly in developing countries. The term socialization refers to an ongoing process by which people learn attitudes, values, and behaviours consistent with their social setting. In a developed society, the media are considered among person's key socialization agents. This role is largely determined by the extensive penetration of the media into daily life. It implies that people's actions and attitudes are principally shaped and influenced by media content (Palmer 2004).

Gerhards *et al.* (1998) stated that public statements in the media are important as a strategy of the integration of collective symbols. Symbols are ways of simplifying. In fact, it is the requirement of the media to represent simplified complex circumstances since they address themselves to a public (Krumland 2004:37). The use of the media to influence belief systems is not unique to the government. Likewise, NGOs and media themselves affect the value system using publicity campaigns and developing relationships with media organizations as a means of raising public awareness. The task of getting this information to the public is best accomplished through the use of public media (Turner 2004 *in* Palmer 2004). Accordingly, the media become the key socialization agent, which influence decision-making and change value systems.

In environmental protection (included forest), media have been evaluated as prominent entities that socialize the general public to include environmental understanding and consideration into their value systems. When evaluated as an instrument to influence public opinion and overall belief systems, the effects of media socialization vary in relation to the entity controlling the information source (Palmer 2004:4). As sources of information, each media has specific targets. Accordingly, an international media has particular targets to influence international lobby groups as well as global society, while a national media usually gives priority to the news related to national interests.

Pluralists perceive society as a complex of competing groups and interests, none of whom is predominant all of the time. Media in a democratic country, on the other hand, can be seen as a bounded system, enjoying an important degree of autonomy from the state, political parties and institutionalized pressure groups. In a democratic country, freedom is assured by the law and, therefore, control of the media is said to be in the hands of autonomous managerial elites who allow a considerable degree of flexibility to media professionals (Gurevitch *et al.* 1982 *in* Chandler 2000).

Chandler (2000) cited that according to Marxists' view, the media are seen as parts of an ideological arena in which various class views are fought out. The ultimate control is increasingly concentrated in the monopoly capital. It is assumed that the media can and is used to socialize into and internalize the norms of the dominant culture. The media send to sound the interests of the dominant classes. Media institutions are regarded as being locked into the power structure, and consequently, as acting largely in tandem with the dominant institutions in society. The media, hence, reproduce the viewpoints of dominant institutions, not as one among a number of alternative perspectives, but rather, as the central and obvious perspective (Curran *et al.* 1982 *in* Chandler 2000). Similar arguments are also given by Eriyanto (2005:11), that media belongs to and is dominated by strong groups of society and tends to marginalize the weak ones.

Forestry, similar to other sectors, is not sterile to media influences. The informative performance of media, such as the one of political programs, varies

greatly in quality (timely and validity of information). Vaguely formulated goals cannot be realized for lack of information. The quality of information is, thus, an important aspect for recognizing the possible impact of forestry programs (Krott 2001:28). Forest fire issues usually receive high attention from various media because they have caused a large catastrophe and become very serious problems both at global and national levels. Severe problems of environmental degradation threatened humans, such as erosion, loss of nutrients, disturbance of vegetation, smoke and haze, are the consequences of forest fires.

The largest areas worldwide regularly affected by fire are the tropical open forests and savannas which are characterized by intermix of seasonally flammable grass layer and more or less open cover of trees and bushes. A major portion of the areas are burned regularly. Prehistorically, fires in these areas were caused by lightning (natural factors). Currently, however, the relative share of fires caused by human intervention (anthropogenic factors) has been rapidly increasing. Fire-return intervals depend on the productivity of ecosystems. It is estimated that several hundred million ha of savannas and open tropical forests are burnt annually. Major problems arise at the interface between fire savannas, residential areas, agricultural systems and forests, which are not adapted to fire. Although fires are not always bad, many important resources are often destroyed by uncontrolled fires (GFMC; Syaufina 2008).

1.2 Problems' Definition

Many issues concerning sustainable forest management emphasize mostly on technical rather than policy aspects. Since sustainable forest management can never be achieved without proper policies, it is very important to conduct studies focussing on the various aspects of forest policies, e.g. regulation, fiscal, administration, and information. Such aspects are information that hold a pivotal role to deliver bottom-up aspirations to the policy makers as well as to disseminate results of policy making process in a top-down way. One of the most important tools in delivering information and making communication of any forestry issues is the media.

Issues concerning forestry are often highlighted in the media, i.e. biological diversity conservation, forestland tenure, illegal logging, poverty situation around forest, and forest fire. Forest fire is one of the most interesting issues discussed in the media both at global and national levels because of its large impacts. The issue of forest fire is more relevant to be discussed by focusing on the highly relevant countries experiencing forest fires, such as Indonesia. However, reliable information on forest fire, especially in the media, has to be understood for further policy making process to manage and combat fires effectively.

Forest fires are a complex problem, related to various aspects of environment, socio-economic, and political situations. Therefore, the active role of scientists is needed to help decision makers in identifying causes of forest fire as well as in finding the best solutions. It follows the arguments of Dunn (2000) about the importance of knowledge utilization in policy-making and Pielke (2007), who argued for the different role of scientists in policy-agenda setting as well as decision-making process. This study, thus, evaluate the role of scientists in forest fire discourses in media and stakeholder's perception towards scientist's influence in policy-making.

Another concern of this study is to understand asymmetrical information due to the domination of powerful groups of society over media Eriyanto (2005:26). Under such situation, he believed that any study on media discourses, which emphasizes on the evaluation of biased information due to imbalance access of information and domination of public and scientific media discourses by strong groups of society will be very significant.

1.3 Outline of the Study

This study is organized into six chapters. Chapter 1 provides an introduction and background of the issues evaluated in the study, problem's definition, and outlines of the study. Chapter 2 explores the previous study of forest fires in Indonesia and their global consequences. It consists of reviews of the characteristics of forest fire in Indonesia, El Nino phenomenon, nature and human factors causing forest fire and impact of forest fires to green house

gases emissions. To lay the theoretical basis for the inquiry, Chapter 3 presents the theoretical backgrounds of the study, comprising the theory of media, discourse, the role of scientists in policy making, interests, information and power, globalization, framing and agenda setting, policy instruments, policy making, and research questions.

Chapter 4 deals with the study frameworks and the research methods used for the study, while Chapter 5 explores the results of study concerning forest fire discourses in media and journals, and discusses the common and different features of those discourses, as well as compares perspectives of media discourse and stakeholder's perception.

Finally, Chapter 6 presents the conclusions of the study. It concludes the results of study according to four research questions, i.e. the portrayal of forest fire discourse in the global and national media, the investigation of the imbalance perspectives in forest fire discourse between global and national news media as well as international and national journals, the role of scientists in media discourse and knowledge-utilization considered in policy-making concerning forest fire, and evaluation of the asymmetrical perspectives between media and stakeholders.

CHAPTER 2

INDONESIAN FOREST FIRE AND ITS GLOBAL CONSEQUENCES

2.1 Indonesia as the Focused Country's Study

Southeast Asia, particularly Indonesia, is one of regions with very large and frequent cases of forest fire in the world. Narendran (2001) summarized major forest fires by countries within the year 1988 to 1998 (**Table 2.1**).

Table 2.1. Major Forest Fire Occurrences by Countries 1988-1998

Country	Year	Causes	Burnt Area	Source
North America (Yellow Stone National Park)	1988	Human, Climate variations, lightning	> 250.000 ha	Ecological Monographs, 1997
Israel	1995	Incendiaries	8,153 ha	IFFN-15
Mongolia	1996	Human	3 million ha	UNEP
Canada	1997	Human, lightning	620,471 ha	NRC, Compendium of Canadian Forestry Statistics, 1998
Brazil	1997	Human, climatic variations	3,3 million ha	INPA, UNEP
S-E Asia (particularly Indonesia)	**1997**	**Human, climatic variations**	**4,5 million ha**	**UNEP**
Russian Federation	1998	Human, climatic variations, lightning	2 million ha	UNEP, UNDAC, National Forest Fire Centre of Russia
Greece	1998	Human	100.000 ha	WWF

Source: Narendran (2001)

In Indonesia, those repeated fires led to the formation of fire climax grasslands of low productivity and short-return interval fires. Severe problems of environmental degradation such as erosion, loss of nutrients, disturbances of vegetation, smoke and haze are the consequences of fires in these forests.

The country contains a large area of peat and peat-swamp forests, covering approximately 19 million hectares. Most of these peat-lands are located in three islands, i.e. Papua, Sumatra, and Kalimantan (Borneo). These peat-lands are naturally covered by closed forest; however, they have suffered extensive fire damage in some El Niño years. In the 1997/98 El Niño event, forest fires dried-out peat and wetlands accounted for 2.1 million ha or 18 percent of the total area burnt in Indonesia. As would be expected, much of the burning occurred in logged or drained peat forestlands. Fires are also common in non El Niño years but are smaller in scale and restricted to accessible areas along rivers, streams and lakes. Deforested and drained peat lands are, however, becoming major annual fire flashpoints, such as in Kalimantan Island and, more recently, in Riau Province (Chokkalingam and Suyanto 2004)

Moreover, Chokkalingam and Suyanto (2004) reported that due to frequent cases of forest fire, Indonesia became a major source of both the annual smoke haze blanketing in Southeast Asia and the greenhouse gas emissions contributing to global warming. In the 1997/98 El Niño event, Indonesian wetland fires accounted for 60% of the regional haze and emitted 0.81-2.57 Gt of Carbon, making Indonesia one of the largest air polluters in the world. In Kalimantan and Sumatra, recurrent fires and associated disturbances in wetlands have led to widespread deforestation, forest degradation and biodiversity loss. In East Kalimantan, repeatedly burnt degraded forests are ultimately transformed into open floodplains and shallow lakes as the peat collapses with vegetation removal or is lost with burning.

Besides the climatic factors, forest fires are often caused by human activities such as land clearing for oil-palm and other crops plantation as well as timber estate, logging, and forestland encroachment (Syaufina 2008:65). Fire is also considered as a cheap and effective community agricultural land management tool in Indonesia, and is a major cause of fire ignition in much of the Sumatra and Kalimantan forests. Fire is used by communities to clear vegetation and improve access into the forestlands for harvesting fish, timber, and other products, to clear land for cultivation, to generate fresh grass for cattle, and to ward off insects and chilliness while camping. Burning is not controlled because communities do not perceive the need to control them. In non El Niño years, community fires are

generally small and create no problem, except in the case of drained peat-lands. In El Niño years, in contrast, intensified community activities and dry conditions lead to more widespread fires (Chokkalingam and Suyanto 2004).

2.2 El Nino Phenomenon and Forest Fire

Historically, fire has been present in Southeast Asian biota since the Pleistocene. Long-term climate variability (glacial vs. non-glacial climate) and short-term climate oscillation are caused by ENSO, events that have repeatedly caused rain forest to be subjected to wildfires (Goldammer 1998). Climatic factors strongly influence the occurrence of forest fire, because they will determine the availability and flammability of fuel material, long-period of drought, as well as humidity (Syaufina 2008:49). A climatic variability, which is supposed to be highly responsible for forest fire in Indonesia, is El-Nino. The El-Nino Southern Oscillation (ENSO) phenomenon is regarded as one of the most striking examples of inter-annual climate variability at a global scale. It is caused by complicated atmospheric-oceanic coupling which is not yet entirely understood. The event is initiated by the Southern Oscillation, which is the variation of pressure difference between the Indonesian low and the South Pacific tropical high. During a low pressure gradient, the westward trade winds are weakened, resulting in the development of positive sea surface temperature anomalies along the coast of Peru and most of the tropical Pacific Ocean. The inter-tropical convergence zone and the South Pacific convergence zone then merge in the vicinity of the dateline, causing the Indonesian low pressure to shift its position into that area. Subsequently, during a typical ENSO event, the higher pressure over Malaysia and Indonesia leads to a decrease in rainfall. The severity of the dry spells depends on the amplitude and persistence of the climate oscillations (Goldammer 1998).

Strong El Nino conditions were associated with heavy precipitation in some areas and exceptionally dry condition in others. Anomalous temperatures and atmospheric circulations were also observed, where in Indonesia long-term dryness persisted over the region, despite the scattered heavy rains. The 1997/1998 El Nino was one of the strongest on record, developing a higher temperature rise than ever recorded. The warming effect of El Nino was

considered as a major factor contributing to the record of high global temperature in 1997 (Winarso 1997; Goldammer 1998; Mori *et al.* 1999).

2.3 The Characteristics of Indonesian Peat Forests

Indonesia contains more than 17 million hectares of peat land, the largest tropical peat-lands in the world (Syaufina 2008:196). Consequently, Seiler and Crutzen argued that a considerable part of the biomass exposed to fire remains unburned, mainly as dead organic matter and charcoal. Whereas the dead organic matter is gradually decomposed by microbial activity, the charcoal cannot be metabolised in significant amounts by micro-organisms and therefore, remains in the soil for a long time. Charcoal or charred organic material is formed during each normal burning process and will, therefore, be present in each area where biomass is regularly burned such as in Kalimantan, Indonesia.

Syaufina (2008:203) stated that there are three types of forest fire: ground fire, surface fire, and crown fire. The peat fire is usually involved in the type of ground fire, where fire spreads under surface and burning organic material slowly (smouldering). In the rain forest biome, a prolonged drought drastically changes the fuel complex and the flammability of the vegetation. Once the precipitation falls below 100 mm per month, and periods of two or more weeks without rain occur, the forest vegetation sheds its leaves progressively with increasing drought stress. In addition, the moisture content of the surface fuels is lowered, while the downed woody material and loosely packed leaf-litter layer contribute to the build-up and spread of surface fires. Aerial fuels such as desiccated climbers and lianas become potential fire ladders resulting in crown fires or “torching” of single trees (Goldammer 1998).

2.4 The Natural Factors as Cause of Forest Fire

Syaufina (2008:49-55) reported that there are several natural factors, both climatic and biomass characteristics, that influence the occurrence of forest fire. The climatic factors, such as sun radiation, air temperature, relative humidity, precipitation, wind, and lightning, are very important factors in determining forest fire. Besides climatic factors, Goldammer and Seibert (1989) stated that

long-lasting fires in coal seams extending to, or near, the surface, found in various rain forest sites in East Kalimantan are other important natural fire sources. It has been assumed that all of the ca. 150 coal seam fire known to be burning at present (White 1992 *in* Goldammer 1998) were ignited by the 1982-1983 wildfires. This, however, was questioned by Goldammer and Seibert (1989), since there were numerous oral reports of burning coal seams had been made prior to the 1982-1983 droughts. In the late 19th century, a Norwegian explorer, Bock (1981) *cited in* Goldammer (1998), reported that Modang people considered burning of coal seams had lasted "since the memory of man".

Syaufina (2008:203) explained that typically peat (associated with coal) fire is characterized by a ground fire. Goldammer and Seibert (1989) observed that the edges of the burning coal seams progress slowly through the ground of the rain forest and cannot be extinguished by water. Even a water body cascading over the edge of a burning coal seam cannot affect the combustion process. During the 1987 ENSO, the ignition of a forest fire by a burning coal spread into the Bukit Suharto Forest Reserve in East Kalimantan. These observations, together with the data on ancient fires and the longevity of coal fire occurrence, suggest that burning coal seams represent a permanent fire source from which wildfires spread whenever a drought occurs and fuel conditions are suitable for carrying a fire. This interaction among climatic variability, fire sources, and wildfires seems to be unique and may clarify the role and impact of long-term interval disturbances of forests caused by fires in the evolutionary process of the rain forest biome.

2.5 The Human Factors as Cause of Forest Fire

Nowadays human factors contributed as a major cause of forest fire (Syaufina 2008:63). Due to increasing number of population, relative share of fires caused by human intervention is rapidly increasing. The direct causes of forest fire, among others, are burning for land-clearing activity for plantation, tenurial conflicts, unintended fire, and shifting cultivation. Shifting cultivation or slash and burn agriculture is commonly practiced in tropical developing countries. Crutzen and Andreae (1990) reported that within shifting agriculture, the land is used for a few years and then allowed to return to forest vegetation during a fallow period

and permanent conversion of forest to grazing or crop lands. In both cases, during the dry season, undergrowth is cut and trees are felled and left to dry some time in order to obtain good burning efficiency. The material is then set on fire. The efficiency of the first burn is variable, and relatively low efficiency is due to the large fraction of the biomass that resides in tree trunks, only a small portion of which is consumed in the first burn. The remaining material may be left to rot or dry but is often collected and set on fire again. Adequate statistics on how much of the original above-ground biomass is finally burned are not available. It is assumed that in primary forests, some 40% was combusted. For secondary forests, which have been affected by human activities and contain smaller material, however, it is assumed that 50% is burned.

Syaufina (2008:154) reported that shifting cultivation is a kind of intended burning that has been practiced by traditional communities in Indonesia since thousand years ago. Crutzen and Andreae (1990) stated that originally, shifting cultivators typically practiced crop and fallow periods of 2 to 3 and 10 to 50 years, respectively. Because of the growing population and lack of forest areas, fallow periods in many regions were shortened so much that the land could not recover to the required productivity, causing shifting agriculture to decline. On the other hand, in other regions, it may still be expanding. In traditional shifting agriculture, no net release of CO_2 to the atmosphere takes place because the forest is allowed to return to its original biomass density during the fallow period. The estimated rates, therefore, mainly represent prompt CO_2 release. However, because of overly frequent burning, the affected ecosystem can hardly recover to their original biomass, so that it results in a net release of C to the atmosphere.

Crutzen and Andreae (1990) also argued that another cause of forest fire is the activity of converting forestland into other land use, primarily agricultural crops or plantations. Permanent removal of tropical forests into timber estates or oil palm plantations, for instance, has currently been progressing at an alarming rate. Besides to develop plantations, the process of forestland conversion is also driven by the expansion of human populations which require additional land, by large-scale resettlement programs from Java into outer islands such as Sumatra, Kalimantan, Sulawesi, Papua and other islands, namely transmigration programs, and by land speculation.

Due to a higher cost of zero burning land clearing, Sahardjo and Munoz (2005:109) stated that controlled burning may be considered as one method of land preparation by small farmers, who have limited financial access. Prescribed burning, however, should be implemented very carefully in peat lands. Low impacts on peat lands could be achieved by applying practical techniques prior to and during burning, e.g. slashing and drying to evenly spread the fire and limit the occurrence of wildfires and creating water canals to protect peat from heat penetration.

2.6 Fire Disaster and Forest Degradation

Forest fire has caused a large catastrophe and resulted in very serious problems in Indonesia's forestry sector. Forest degradation and repeated fires lead to the formation of fire climax grasslands of low productivity and short-return interval fires. Severe problems of environmental degradation such as erosion, loss of nutrients, disturbances of vegetation, smoke and haze are the consequence of fires in these forests. According to Syaufina (2008:195) forest fire in 1997/1998 burned approximately 10 million ha of Indonesian forests and economically lost about US$ 10 billion to the country.

The Ministry of Forestry (2008) reported that forest fire burned nearly seven thousands ha of Indonesian forest areas in the year 2007. A number of preventive measures had been taken to combat the fire, for example, by hotspots detection. During 2008, for instance, it was identified that there were about 30 thousands fire hotspots in Indonesia (**Figure 2.1**).

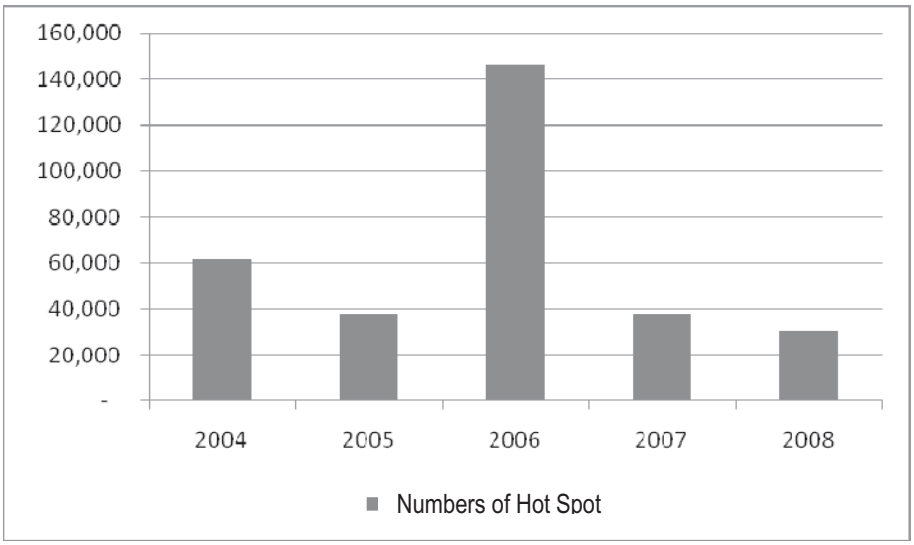


Figure 2.1. Hot Spot Distributions in Indonesia 2004-2008

It is also important to note that forest fires occurred mostly in the *Imperata* lands, grasslands or uncovered-lands. Other fires might also occur in forest concession areas and in forest plantation areas. **Table 2.2** illustrates an estimation of the forest fire extent in Indonesia by province.

Table 2.2. The Extent of Forest Fire in Indonesia by Provinces

No	Province	Year (Ha)		
		2005	2006	2007
1	Nangroe Aceh Darussalam	-	-	24.00
2	North Sumatra	4,000.12	315.50	131.00
3	West Sumatra	-	-	16.50
4	Riau	-	-	37.75
5	Riau Islands	-	-	-
6	Jambi	67.00	1,227.60	55.00
7	Bengkulu	-	-	-
8	South Sumatra	-	-	27.00
9	Bangka Belitung	-	17.50	-
10	Lampung	-	-	2,532.25
11	Special Capital Region of Jakarta	-	-	-
12	West Java	1.05	1,704.00	372.00
13	Banten	-	-	-
14	Central Jawa	-	-	516.50
15	Special Region of Yogyakarta	-	-	-
16	East Java	588.80	488.99	1,821.80
17	Bali	-	-	-
18	West Nusa Tenggara	-	-	-
19	East Nusa Tenggara	657.50	300.00	1,415.82
20	West Kalimantan	4.00	85.00	-
21	Central Kalimantan East	-	-	-
22	Kalimantan	102.00	-	-
23	South Kalimantan	-	-	25.00
24	Gorontalo	-	-	-
25	North Sulawesi	-	-	-
26	Central Sulawesi	-	-	-
27	South Sulawesi	82.00	2.00	-
28	South-east Sulawesi	-	-	-
29	West Sulawesi	-	-	-
30	Maluku	-	-	-
31	North Maluku	-	-	-
32	Papua	-	-	-
33	Papua Barat	-	-	-
	Total	**5,502.47**	**4,140.59**	**6,974.62**

Source: Directorate General of Forest Protection and Nature Conservation, MoF (2008); Note: (-) = No data

2.7 Forest Fire Cycle in Indonesia

Chandler *et al.* (1983) stated that weather and climate influence forest fires through various ways, some are:

1) Climate determines the total number of available fuel of vegetation in the forests.
2) Climate determines the duration and intensity of forest fire.
3) Weather determines the moisture contents and flammability of forest biomass.
4) Weather determines the burning process and spread of fire.

Although the common role of climate and weather in determining forest fire was generally accepted, until now it is still difficult to define a fixed model to predict forest fire cycle due to the complexity of climatic factors, vegetations, fuels, different actors and other various triggering factors. To predict forest fire cycle, firstly, it is important to understand the climatic factors that can affect burning. Since the beginning of 20th century, there have been only few cases of the large fires but one important note was that large fire started during 1982 coincided with the drought as the impact of El Nino phenomena. The impact of this phenomenon caused the perfect fires of the peat soil area over East Borneo Island of Indonesia. As the source of coal mining, this soil is usually active within dry environment and inactive in wet environment. The sudden arise of the El Nino activity in 1991/92 definitely caused large fires and for the first time caused trans-boundary air pollution of haze/smoke over Indonesia and neighbouring countries. This occurrence took place again in 1994/1995 with the same impact of fires and trans-boundary air pollution. The latest or current development of El Nino in 1997/1998 was classified as strong El Nino activity with faster increasing of SST (Sea Surface Temperature) anomaly over East Equator Pacific waters compared with the previous occurrence 30 years ago (Winarso 1998).

The current development of the variability of the El Nino and its impact, together with supporting other matters of the changing environment due to the increasing population might encourage new development of the meteorological parameter

of haze over wider areas. It occurred and coincided with the land & forest fires as further impact of the drought for the latest occurrences of 1991, 1994 and 1997/98. Syaufina (2008:135) reported that the increasing or decreasing number of hotspots is strongly influenced by the intensity of the precipitation. In general, the highest number of hot spots in Indonesia is found in July, when the precipitation intensity is very low.

Winarso (1998) reported that based upon earlier operational study of fire occurrence in 1991 and 1994, it was found that the fire commenced after a period of more than one dry month, especially from August to October. Further investigation found that fires usually started in the middle of August then became intense during September-October coincided with smoke/haze formation especially over Sumatra and Kalimantan Islands, then they spread out to entire Malaysia and Singapore areas (**Figure 2.2**).

Figure 2.2. Time Distribution of Forest Fire's Pattern in Indonesia

Notes:

: rainy season

: early dry season

: forest fire

: smoke and haze in Sumatra and Kalimantan :

: smoke and haze spread out entire Malaysia and Singapore

The occurrence of strong development of 1997/98 El Nino, however, coincided with the delay of the onset and the weakening of the monsoonal wind system which gave other considerations for the development of fires and trans-boundary smoke/haze over this region. Lack of models and studies of tropical atmosphere during the episode of these occurrences, have encouraged misperception of the fires and trans-boundary smoke/haze formation (Winarso 1998).

Nevertheless, one aspect that might often be forgotten is the characteristic of other meteorological parameters of surface air temperature and humidity. This

character gives an idea of the air temperature and humidity annual patterns. Air temperature relates to the warming of environment and humidity associates with cloud, fog, or haze formation. Besides, the monsoonal wind pattern over the region can be analyzed to obtain either unstable or stable air structure. Based upon the operational investigation and studies, it can be concluded that fires arose if the environment was dry due to the impact of El Nino. The fires might be intense especially during March to April and September to October with continuing emission smoke phase (Winarso 1998).

As discussed previously, forest fires in South East Asia have additional implications which are not yet entirely understood. The global climate is determined critically by tropical convective air movements, leading to the injection of air masses into high altitudes of the atmosphere and their long-range transport and redistribution. These global circulation patterns originate at the continental and oceanic surfaces with elevated temperatures. This “warm pool” of the globe is in the maritime continent of the equatorial region of Asia. In the mid of the warmest region of the world, the Indonesian archipelago, extensive burning of vegetation (shifting cultivation, forest conversion burning, and other agricultural burning) took place although the impacts of these fires on atmospheric chemistry have not yet been explored. It is assumed that two major patterns of emission distribution from vegetation fires exist (Goldammer 1998):

- During the “High Phase” (normal years), low pressure is centred over the hot spots. Air masses with products from biomass burning (aerosols, trace gases) are carried to the high troposphere and exported globally.
- During the “Low Phase” the warm waters of the “warm pool” are transported to the eastern Pacific, and high pressure builds up over the Indonesian archipelago. A typical ENSO situation develops during which emission from forest burning are trapped in the lower troposphere.

The last years with extraordinary fire activities in Indonesia were years characterized by the Low Phase of the Walker Circulation. The fire season of 1982-83 was characterized by escaped land-use fires which caused large-size wildfires on several million hectares. In the following years, the situation was different. The smokes emitted from the Indonesian archipelago in 1987, 1991,

1994 and 1997 were not primarily caused by wildfires. The main sources were shifting cultivation and the systematic application of fire for converting forests into plantation (Goldammer 1998).

2.8 Forest Fire's Impacts to the Green House Gases Emission

The impact of fires on the climate has been a cause of concern among scientists. During the burning process, several gases such as CO_2, CO, and NO_x are released which contribute to the overall burden of green house gases concentration in tropospheric ozone (Syaufina 2008:23). Crutzen and Andeae (1990) reported that with net global CO_2 emissions of 1.1 to 3.6 Pg of C per year, tropical forests clearing may be responsible for 20 to 60% of the greenhouse warming caused by the CO_2 emission from fossil fuel burning. Biomass burning also releases another greenhouse gas, CH_4. In this case, biomass burning accounts for only about 10% of the global CH_4 source, but probably for a greater fraction of the increase in global emissions. Estimates of the temporal trends of CH_4 source strengths from 1940 to 1980 suggested that the pyrogenic contribution to the increase in CH_4 emissions over that time period was 10 to 40%.

Syaufina *et al.* (2003) reported that the emission level of green house gases resulted from ground fire of peat lands in West Kalimantan (Indonesia) are relatively high (**Table 2.3**).

Table 2.3. Green House Gases Emission of Peat land's Ground Fire

Burning Phase	Green House Gases Emission (ppm)			
	CO_2	CO	NO_x	Total
Flaming	68,403	100,990	126,932	296,325
Smouldering	59,943	113,336	113,336	257,327
Glowing	62,435	118,229	118,229	268,718
Total	**190,781**	**237,093**	**358,497**	**822,371**

Source: Syaufina et al. (2003)

Crutzen and Andeae (1990) argued that the climatic effect of the smoke aerosols is beyond current understanding because of the complex nature of the interactions involved. Aerosols can influence climate directly by changing Earth's radiation balance. They reflect sunlight back into space. Smoke particles also contain black (elemental) C, which may strongly absorb sunlight and thus, causing the heating of the atmosphere and less penetration of solar energy to Earth's surface. Such an effect has an influence on the heat balance of the lower troposphere, and results in less solar heating of the surface, warming of the atmosphere, and more stable meteorological conditions. The large daytime temperature drops can occur below smoke plumes from mid-latitude forest fires. Considering the great extent and expansion of tropical biomass burning, a widespread effect of this kind may well have masked the expected greenhouse temperature rise during the dry season in tropical continents.

Crutzen and Andreae (1990) stated that the equatorial regions are extremely important in absorbing solar energy and in redistributing this heat through the atmosphere. Therefore, any changes in green house gases composition in these regions may have highly significant impact towards world's climate. In recent years, increasing attention has been given to the impact of tropical fires on regional and global scale environmental processes, e.g., the role of tropical fires in biogeochemical cycles and especially in the chemistry of the atmosphere (Crutzen and Goldammer 1993 *in* Goldammer 1998). Recent estimates of the magnitude of tropical plant biomass burned in shifting agriculture, permanent deforestation, other forest fires and savannah fires revealed that the prompt (gross) annual release of carbon into the atmosphere from these fires range between one and four billion tonnes. Though the amount of carbon remaining in the atmosphere (net release) is not exactly known, it is generally accepted that the annual net release of carbon into the atmosphere from plant biomass burned for permanent conversion of tropical forest into other land uses (net deforestation) amounts ca. 1 billion tons per year (Goldammer 1998).

Although the emissions from tropical vegetation fires are dominated by carbon dioxide (CO_2), many products of incomplete combustion that play important

roles in atmospheric chemistry and climate are emitted as well. Much of the burning is regionally concentrated, occurring mainly during the dry season, and resulting in levels of atmospheric pollution that rival those in the industrialized regions of the developed world. Photochemical reactions, for instance, in the plumes of vegetation fires may be responsible for as much as one third of global input of ozone into the troposphere. Recent observations of seasonally elevated levels of tropospheric ozone in some tropical regions, particularly over the southern tropical Atlantic Ocean between South America and Africa, have been explained by emission from tropical wild land fires and subsequent photochemical processes which may play an important role in atmospheric chemistry over that large region of the earth (Andreae *et al.* 1993 *in* Goldammer 1998).

2.9 Air Pollution Affected by Forest Fires

According to IFFN (2000), between July and November 1997, an estimated 45,000 km^2 of forest and land were burnt on the islands of Sumatra and Kalimantan. In the first half of 1998, another fire episode affected roughly a similar area in Kalimantan alone. Syaufina (2008:196) stated that in differentiating with the 1982/1983 forest fire, the 1997/1998 and 2002 forest fires were dominated by fires in peat forests, which released much more emissions. The emissions of these fires caused considerable air pollution throughout the Southeast Asian regions, notably in Indonesia, Singapore and Malaysia, which resulted in decreased quality of life for more than 70 million people in this region. IFFN (2000) reported that the air pollutant that predominantly caused violations of ambient air quality standards was particulate matter. Particulate matter may cause acute and chronic respiratory diseases such as bronchitis, asthma and upper respiratory tract infections. Increased ambient particle concentrations are suspected to be linked with increased daily mortality. By scattering and absorbing light, particulates also result in reduced visibility, impairing transportation by air, land and water. Fire-related air pollution episodes are a recurrent phenomenon in Southeast Asia. Nine incidents have been reported to occur over the last 20 years, in which the 1997/98 smoke haze episode attracted the broadest attention.

IFFN (2000) reported that in contrast to Singapore and Malaysia, Indonesia has not yet had an integrated air quality monitoring network which could provide real-time, region-covering air quality information. Due to the absence of such information, an assessment of the severity of the fire-related air pollution episodes is limited. As a surrogate, horizontal visibility was frequently used to report the status of ambient air pollution. However, even though sufficient information on the status of air quality was available in Singapore and Malaysia, much uncertainty existed on the impacts of such air pollution episodes and on how to response adequately to them. The governments of the affected countries recommended the public to remain indoors as much as possible, to avoid physical exertion and to wear respiratory masks outdoors. In several places, the state of emergency was leading to the closure of schools, public offices and factories.

Similar to Winarso (1998), IFFN (2000) also stated that the influence of the 1997 fires in Kalimantan and Sumatra on ambient air quality was discernible by July, peaked in September to October and weakened by November, when the delayed monsoonal rain extinguished the fire. During the peak episode, satellite imagery showed a smoke haze layer which expanded over an area of more than 3 million km^2, covering large parts of Sumatra and Kalimantan. Its northward extension partially reached Malaysia, Singapore, Brunei and Thailand. During this period, particulate matter concentrations frequently exceeded the national ambient air quality standards. Scanty particle measurement data at hand for areas close to fires in Kalimantan and Sumatra indicate that ambient particle concentration was roughly 20 to 40 times the normal (non-haze) background concentration and exceeded levels categorised as “hazardous”. Monthly mean horizontal visibility at most locations in Sumatra and Kalimantan in September was below 1 km and daily maximum visibility was frequently below 100 metres.

In Singapore and Peninsular Malaysia, a two to five-fold rise in ambient particle concentration was recorded. Visibility below 2 km predominantly prevailed at both locations during the smoke haze episode. In contrast to the situation in 1997, the fire-related air pollution episode in the first half of 1998 was essentially restricted to Borneo. This was mainly due to the weakened southerly

monsoonal flow by that time. However, again, the population in Kalimantan and Borneo-Malaysia was exposed to distinctively elevated air pollution for a period of months (IFFN 2000).

CHAPTER 3

THEORETICAL FRAMEWORK

The overall discussion of this study is desired to understand the dynamics of political communication concerning the issues of forest fire. This study is aimed to discuss the portrayal of forest fire discourse in the global and national media. This study will also examine the asymmetrical perspectives of forest fire issues between global and national media, as well as media and stakeholders. To make a proper analysis, this study needs supports of interdisciplinary theories, which will be discussed in this section.

3.1 Media

Media play an important role in political communication and also provide diverse public platforms for the presentation of policies (Krott 2005:168). Curran (2002) stated that media assist in the aggregation of interests within the political process, provide a channel for communication, facilitate the revision of shared aims and policies, help society identity and evolve political responses. Hardt (2004) highlighted that the media play a crucial role in mediating in the process of public deliberation and sometimes, in defusing concerns and opinions of their own making.

According to Krott (2005:174) the political impact of opinions in the media lies primarily in the elaborated impact of the media on the individual and general public with indirect consequences for politicians. The media give the responsible person an objective instrument of information and control. However, in practice, it is greatly distorted by misinformation since the media report selectively and the public never gleans any information without distorting it to some extent. The similar arguments are also explained by Pan and Kosicki (2001), who point out that media reflect a constructed reality rather than reality itself. Media contents are also biased by institutional and ideological

orientation. Therefore, media are not a neutral arena but political actors in public deliberation.

3.2 Discourse

Discourse is one of the most popular contemporary terms together with democracy, human right, civil society, and environment. However, the more frequent a certain word is used, it usually tends to have large and unclear meaning (Eriyanto 2005:1). There are many definitions of discourse. Literally, discourse means written or spoken communication or debate, a formal discussion of a topic in speech or writing. In linguistics, furthermore, discourse refers to a text or conversation (Oxford University Press 2001). According to Keller (1997:311) discourse is a general every day understanding of "discussion", "speech" or "argument" which one associates with and examines regarding fundamental rules of linguistic communication and linguistically mediated interaction. Discourse can also be understood as a specific content-thematically institutionalized form of text-production.

From a methodological point of view, the discourse is mostly used in discourse analysis. In the 1960s discourse analysis referred to semiotic or linguistic methods of study of texts and communication events. Linguistic discourse analysis focused on the grammar of discourse and discourse structure (van Dijk 1985). Furthermore, van Dijk (1985) stated that in 1970s systematic discourse analysis took account of the language and social context in which language was used. Language began to be considered as a form of social interaction that had elements of conversation analysis and content analysis. Scientifically, Foucault (1981) explained that discourse can be a scope of all statements, individualization of a statement group, or a regulative practice from a number of statements. He was interested in the way discourses are organized, who get to participate in discourse and contribute to it, who is excluded from it, and under which conditions discourse is transformed. According to Hajer (1995), discourse is "...a specific ensembles of ideas, concepts, and categorizations that is produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities." Meanwhile,

Fowler (1996) stated that discourse is a spoken or written communication based on belief, value, and category, in which belief can represent a worldview, an organization, or representation of experiences.

The term discourse is used for various disciplines such as linguistics, psychology, sociology, politics, communication, literature, and many other disciplines. In general, different disciplines, scientists, and even dictionaries have their particular definition on discourse due to different contexts, purposes, and scopes of disciplines (Eriyanto 2005:1).

According to van Dijk (1989), discourse analysis emerged as a trans-disciplinary field of study in social sciences, concerned with the systematic study of the structures and functions of texts and talks. The theories and methods of the new interdisciplinary field of discourse analysis may be brought to bear in a more systematic and explicit account of the structures of media messages. Since discourse analysis is a multi-disciplinary approach, Eriyanto (2005:275) explained that discourse, according to van Dijk, has three dimensions i.e. text, social cognitive, and context. In the dimension of texts, a discourse studies the text structures and strategies to determine certain themes. In the social cognitive dimension, moreover, a discourse studies the process of making texts in news production which involves both individual and journalist cognitive. Finally, in the dimension of contexts, a discourse studies the discourse developed in a society towards certain problems.

Furthermore, van Dijk (1991) explained that such a process analysis may very well be combined with an analysis of structures or strategies. Indeed, processes involve structures or strategies of mental representations. The descriptions of structures, strategies or process should at least be somewhat interesting, new, or original.

There are several approaches to conduct discourse analysis, some of which are referred to Faucoult, Habermas, Hajer, Roger Flower, Robert Hodge, Gunther Kress, Tony Trew, Theo van Leeuwen, Sara Mills, Teun van Dijk, and Norman Fairclough. According to Eriyanto (2005:342), almost all approaches have similarities for certain views; namely:

- First: Ideology is the central and the most important analysis. Roger Flower stated that ideology and power always influence in choosing syntactical or grammatical of the text. Fairclough also stated that all texts always contain an ideology, whether it is shown or hidden. The ideology is reflected from the choice of words, sentences, or styles of texts.
- Second: all approaches hold that power is also the central issue of each analysis, and discourse can be used to enlarge and strengthen this power. Each actor or group in a society has different strength of power. The stronger the power, the more powerful it is in influencing discourse, or in determining the chosen discourses.
- Third: all approaches restrain that discourse can be manipulated by dominant groups or the power holders in a society to meet their own interest. Discourse is not only used to produce or reproduce power of the dominant group, but also to marginalize the weak groups.

All approaches try to connect texts on one side with society on the other. However, there are also some differences of these approaches, where the main difference lies on how the relation of text and social context can be explained. The following **Table 3.1** shows the similarities and differences of several approaches on discourse analysis.

Table 3.1. Similarities and Differences among Several Approaches on Discourse Analysis.

Approach	Level of Analysis		
	Micro (text)	Meso	Macro (social)
Roger Fowler, Robert Hodge, Gunther Kress, and Tony Trew	X		X
Theo van Leeuwen	X		X
Sara Mills	X		X
Teun van Dijk	X	X	X
Norman Fairclough	X	X	X

Source: Eriyanto (2005: 344)

Generally, there are three levels of discourse analysis. First, “micro analysis”; this analysis determines only on the text. Second, “macro analysis”; it analyzes social structure, economic, politic, or socio-culture of society. The macro analysis is often conducted to describe how the dominant groups or powerful actors (including the media) can determine discourses and spread their ideas into a society. The third is “meso analysis”; it is a bridging from the text (micro) into social context (macro). This analysis is commonly used by van Dijk and Fairclough, but ignored or less used by Fowler, Hodge, Kress, Trew, van Leeuwen, and Mills. The reason is that social context (macro) can mostly be explained only by analyzing the text. On the contrary, referring to van Dijk and Fairclough, there are large gaps between texts (at micro level) and social context (at macro level). Therefore, it will be very difficult to explain social context precisely without understanding the factual situation of the respective issues in a society (Eriyanto 2005: 344). In this study, the discourse on forest fire, both on a scientific level as on a public one, is understood as: the communication about topics and actors that are relevant to the discussion on forest fire.

3.3 The Role of Scientists in Policy-Making

Dunn (2000:45) introduced the term of “knowledge utilization”, “policy-relevant knowledge”, and “policy presentation”. Knowledge utilization means the use of knowledge by policy makers to improve processes and results of decision making. Using knowledge in a policy analysis varied on composition, scopes, and impacts. Meanwhile, “policy-relevant information” is defined as a selective interpreted data, structured in certain categories, to be informed to policy analysts and political actors concerning policy problems, policy prospects, policy actions, policy results, and policy performances. Any information relevant to a respective policy will be transformed into a scientific claim through policy arguments. The third important term related to knowledge is “policy presentation”, which is defined as interactive ways to communicate knowledge relevant to a policy, consisting of speaking, conference, meeting, informing, and public hearing.

Pielke (2007) indicates four types of scientist role and argued that most of them can play a very important role in policy-making. They are classified as follows:

1) "Pure scientist", with no interest in decision making process and simply share some fundamental information.
2) "Science arbiter", as a resource for decision making, standing ready to answer factual questions that the decision maker thinks are relevant.
3) "Issue advocate", try to convince the decision maker to take particular decision, telling the decision maker what he or she ought to prefer.
4) "Honest broker of policy alternative", provides basic information on each choices, makes an effort to expand (or at least to clarify) the scope of choices, and let the decision maker face the challenge of reducing the scope of choices based on his or her preferences and values. Honest Broker of Policy Alternative is often best achieved through a collection of experts working together with a range of views, experiences, and knowledge.

3.4 Interests

Interest is one of the most important factors in driving force of politics. The confusion, contradictions, selfishness, or hypocrisy characterize the political process. According to Krott (2005:7) "*… Interests are based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest".*

Abromeit (1993:13) *cited in* Krott (2005:7-8) argues that in general, interests constitute the cornerstone of modern social sciences and therefore, they play a major role in determining all measures taken by politicians. All goals are usually hardly binding, therefore, politicians tend to follow their self-interests as far as possible. Since interests unveil the truth, they are not all openly displayed, but kept secret according to the respective tactics. Interests are geared to the benefits gained by the political player or stakeholder. To reveal the key interests, the three dimensions of ecology, economy and social factors can be

of help. As a rule, each interest is embedded in these three areas (Grundmann 1998; Krott 2005:9).

In environment politics, interests are divided into three positions, i.e. causers, victims, and helpers. Any actor who represents one of those positions has either advantages or disadvantages in the political process. Actors will acquire a negative image if they are described as the causer of problems. Vice versa, actors who are seen as victims indicate powerlessness and therefore, could appeal sympathy. If actors are seen as helpers, they are definitely advantageous and could acquire a positive image from the public (Von Prittwitz 1990).

Interests are related to needs, since they are directly derived from the psychological and biological factors of humankind following the classification of Maslow, i.e. 1) physiological needs; 2) security needs; 3) the needs for belonging and love; 4) the needs for respect; and 5) the needs for self-actualization. These factors are related to the determination of interests. Because the psychological and biological needs of mankind have not yet been satisfactorily defined, it is difficult to identify the area of human interests (Heinze 1981:34; Krott 2005:11).

3.5 Information and Power

Information is the basic and most common political instrument for regulating human action which affects people's decisions and actions in two completely different political levels, i.e. public awareness and power. It can be stated that *"the most important aspects of information are clarity, consistency and truth in terms of corresponding to reality"* (Brewer *et al* 1983 *cited in* Krott 2005:13).

In some cases, it is commonly found that regulatory processes encompass numerous formulations that are very poor in information content. Therefore, it can be seen that the degree of quality in information is an important attribute for determining certain regulations. In forest policy practice, any efforts towards improving forest policy regulations and respective scientific analyses are mostly

aimed at quality information (Krott 2005:14). He summarized that by achieving high information content, forest policy regulation will become more effective.

Information is going to become much more effective when associated with power. Max Weber defined power as the probability in a social relationship, where one can assert one's own will against that of the opposition (Park 2009:26). According to the Weber's definition, power can be described as the *"probability that a person can assert his own will in a social relationship, despite resistance...."*. In actual fact, stakeholders and political players both avail themselves of power. In practice, "*power is a factor that comes in many forms and is often concealed where it is strongest – the powerful do not need loud voices. Power resists scientific analysis; all other aspects of forest policy are easier to discuss than that of power"* (Krott 2005:14).

By means of normative dimensions, borrowing the concept of communicative power from Arendt, Habermas (1998) viewed that power has potential for the formation of a common will in non-coercive communication. In the context of forest policy, Krott (2005:15) argued that by using information and power, forest policy can achieve three different types of conflict resolution, i.e. first, raising public awareness via information; second, promoting practical solution; and third, negotiation. He stated that by raising public awareness via information, policymakers hope to influence the stakeholders' views that were formed according to their self-interests. The use of information for the purpose of raising awareness is widespread and obvious in the forest sector, e.g. serving to alleviate the conflict. It is also important to note that policy-making has achieved far more success in regulating conflicts by using information to promote practical solutions. The traditional concept of multipurpose forests, for instance, offers a great potential of practical solutions along this line. The limits of providing information and practical solutions, however, are found wherever different interests in a forest cannot be realized simultaneously. It is also commonly found that the regulation of such conflicts follows a pattern of negotiation and therefore, various interests, instruments of power, threats, as well as executive power, are engaged until a regulation is found. The effectiveness of information is, thus, also strongly determined by political communication, which refers to *"any exchange of symbols or messages that to*

a significant extent have been shaped by or have consequences for the political system" (Meadow 1980:4).

A policy-relevant communication is a process in connecting these activities: policy analysis, structuring content, interactive communication, and science utilization (Dunn 2000). A raising public awareness, therefore, could be achieved among others, through correct information to stakeholders about the environment or their specific actions. Stakeholders, thus, can gain a broader basis for decision making by improving their capacity to take the proper action. In forest policy practice, the better the information, the easier it is for the stakeholder to choose the optimum forestry measures to promote his self-interests. Informational instruments are usually employed both for the purpose of achieving public awareness as well as power. In democratic systems, the public awareness is usually generated by proper instruments of information (Krott 2005:151-152).

3.6 Globalization

Globalization can be seen from several different perspectives. Fiss and Hirsch (2005) identified three main frames of globalization:

1) The positive frame points to the potential benefits of globalization. This frame is supported by several groups, i.e. neo-liberalism, global village, international cooperation and world government. Supporters for neo-liberalism claim that globalization will increase economic prosperity as well as opportunity, especially among developing nations, enhance civil liberties and lead to a more efficient allocation of resources.
2) The neutral frame portrays globalization as a natural, evolutionary, and largely inevitable development. This discourse, which is usually associated with the financial community, avoids making moral judgments.
3) The negative frame points out the increasing potential for economic crisis, the threat to the livelihoods of workers, and the growing income inequality caused by globalization. This frame also includes discourse which is primarily concerned with the negative impact of globalization in

> the developing countries. A large-scale anti-globalization movement is primarily concerned with the negative impact of globalization in developing countries. Their concerns range from environmental issues to issues like democracy, national sovereignty and the exploitation of workers.

In a global information era, however, global media communication has been posing a number of vexed problems for different people, cultures, and nations. It has also caused the efflorescence of localizing or globalizing forces in many of its subsets, including politics, economy, culture, technology, and identity. Therefore, unlike a common misconception about the conflict between the global and the local, these two forces in fact feed off each other (Giddens 2000:31; Tomlinson 1999:207). Globalization, therefore, is understood as an interlinked change of politics, economy, technology, and culture which are largely influenced by developments in systems of communication (Giddens 2000). Eriyanto (2005:26) stated that in the imbalance power situation of global society, media belonged to and dominated by the powerful group of society, where the powerless would be marginalized.

The impact of globalization, however, is a result of complex processes. Bustello (2003) argued that a mixture of global and local forces should be involved in the process and outcomes of globalization, rather than simplified binary views on globalization, such as: global vs. local, center vs. periphery, cultural imperialism vs. local resistance. Various political, economic, historical, and cultural factors are at interplay in shaping the contour of globalization in one region. Following Bustello's argument, thus, globalization is not the same with homogenization, and therefore, is not always creating imperialism. Giddens (2000:31) stated that globalization is not necessarily the same as homogenization of the world controlled by 'free-marketers,' but rather it presents a real opportunity *"for the revival of local cultural identities in different parts of the world … [creating] new economic and cultural zones within and across nations".* Instead of homogenization, Robertson (1992) argued globalization as integrating both globalizing and localizing dimensions.

Tomlinson (1991) summarized more comprehensive views on the relation between globalization and imperialism by giving explanation on a wide spectrum of theoretical views on imperialism, particularly the (cultural) media imperialism. Media imperialism has been a powerful theoretical framework with respect to the nature, process, and outcomes of global communications, especially since the seventies when the western government and multinational corporate aggressively sought to expand their political and cultural powers internationally (Antonio and Bonanno 2000; Rupert 2000).

According to the political economic approach, the corporate on mass-media gives neo-liberal demagogues a propaganda station in order to disseminate their pro-market messages into every corner of our cultural environment (Herman and McChesney 1997). Although cultural aspects of globalization has been understood as a process towards cultural imperialism, as seen in terms such as McDonaldization (Ritzer 1996) and Coca-colonization (Wagnleitner 1994), it is also argued that globalization is far less coherent as cultural-media imperialism.

3.7 Framing and Agenda-setting

The term of “framing” is the activity “to select some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described” (Semetko and Valkenburg 2000). McCombs *et al.* (1997) argued that framing is regarded as an extension of agenda setting and it naturally has an impact in audience interpretation of news.

According to Manser (1995:8), agenda is a list of things to be discussed at a meeting, and setting is a place in which something is fixed. The agenda-setting process is an ongoing competition among proponents of an issue to gain the attention of the media, the public, and policy makers (Dearing and Roger 1996). Agenda-setting theory, however, has been introduced among others by McCombs and Shaw. They defined agenda-setting as the creation of public awareness and concern of salient issues by the public media. It describes a

very powerful influence of the media which reflects the ability to tell us which issues are important (McCombs and Shaw 1972). In other words, the agenda-setting theory states that the public media have a large influence on audiences by their choice of stories that they consider newsworthy. The theory's main postulate is salient transfer, i.e. the ability of the mass media to transfer issues of importance from the mass media agendas to public as well as policy agendas.

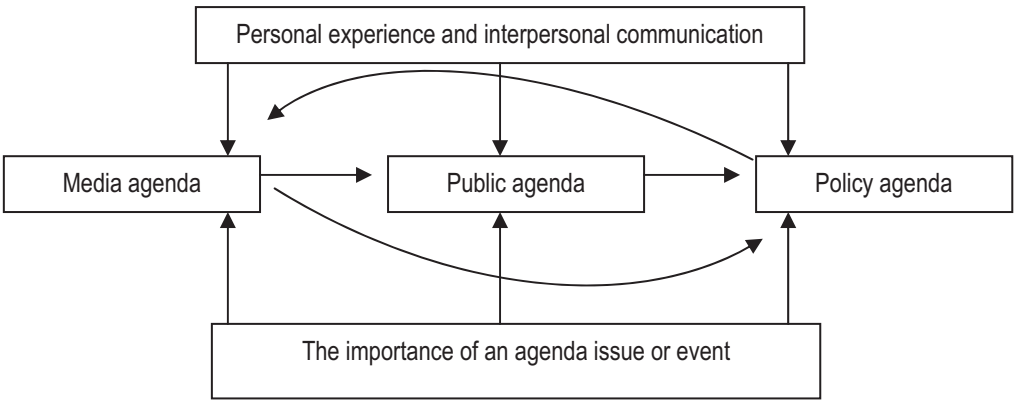
McCombs and Shaw (1972) reported that there are two most important elements of agenda-setting, i.e. awareness and information. To investigate the agenda-setting function of the mass media, they attempted to assess the relationship between what people in certain community said about the important issues and the actual content of the media messages. They concluded that the media exerted a significant influence on what people considered to be the major issues of certain matter.

Agenda-setting is one of the ways in which the mass media can influence public opinion. Usually, different media have different agenda-setting and therefore, in this way, analysis of agenda-setting seems quite appropriate to understand the pervasive role of different media. The news media, by choosing what they display as news, can determine which issues the public will think and talk about (Severin and Tankard 1992). Scientifically, the agenda-setting theory has been widely accepted, since it predicts that if people are exposed to the same media, they will place importance on the same issues. A more comprehensive explanation about agenda-setting was given by Chaffee and Berger (1987) and then, Dearing and Rogers (1996). The agenda-setting research should focus on the characteristics of audience, the issues, and the media that might predict variations in the agenda setting effect. Chaffee and Berger (1987) explored that the agenda-setting process includes three different kinds of agendas, i.e.

- Media agenda (issues discussed in the media, such as newspapers, television, and radio).
- Public agenda (issues discussed and personally relevant to members of the public).

- Policy agenda (issues that policy makers consider important, such as legislators).

Dearing and Rogers (1996) hold that there is also interrelationship between those three elements (media, public, and policy) of agenda-setting. They stated that the heart of process comes when knowledge about an issue changes in the media agenda, the public agenda and the policy agenda (**Figure 3.1**).



Source: adopted from McQuail and Windahl (1993); Dearing & Rogers (1996)

Figure 3.1. Interrelationship Between Media Agenda, Public Agenda and Policy Agenda

According to McCombs (2002:2), social scientists who examine the agenda-setting of the news media, which influence the public, usually have focused on public issues. Certain agenda is found in its pattern of coverage on public issues over some period of time, a week, a month, an entire year, or any other periods. Over this period of time, few issues are emphasized; some received light coverage, and many are seldom or never mentioned. It should be noted that the use of the term “agenda” here is purely descriptive. The media agenda presented to the public results from the decisions by many different journalists and their supervisors about the news of the moment. Since there are interrelationships between media agenda, public agenda and policy agenda, changing the media and public agenda will also influence to the policy agenda.

There are two levels of agenda-setting research. The first-level agenda setting is most traditionally studied by researchers. In this level, the media use objects or issues to influence the public or policy makers, and suggest what the public or policy makers should think about (amount of coverage). It refers to the

question about which issue the public think and discuss. In second-level agenda setting, the media focus on the characteristics of the objects or issues. It is focused on the questions if and how the characteristic of an issue leads to how the public or policy maker thinks about this issue. Unlike the first level agenda, in this level, the media suggest how people or policy makers should think about the issue. Considering the attribute is also important in conducting agenda-setting research. There are two types of attributes: cognitive (substantive or topics) and affective (evaluative, or positive, negative, neutral). Cognitive attribute refers to the substance of issue, while the affective attribute means evaluated "position" of certain issue or importance level of issue. Inter-media agenda setting involves salient transfer among the media (Coleman and Banning 2006; Lee 2005; Shoemaker & Reese 1996).

In a political study, understanding policy agenda-setting is very important since the policy agenda is one of the pivotal steps of policy cycle (Birner 2001). Research on policy agenda-setting is primarily needed for an analysis of policy-making process (ex-ante analysis). According to Birner (2001), there are two ways to make policy analysis, i.e. normative analysis and positive analysis. The normative analysis is an analysis to answer the question "what should be", while positive analysis is done to answer the question "what is". Similar with Birner, Dunn (2000) appointed three approaches of policy analysis: empiric or descriptive, function or valuative, and normative or prescriptive. Those analytical approaches are very important and can be applied in a policy study.

3.8 Policy Instruments

Policy is *"a standing decision characterized by behavioral consistency and repetitiveness on the part of both those who make it and those abide by it"* (Jones 1977). Jenkins (1978) defined policy as *"a set of interrelated decision taken by political actors or group of actors concerning the selection of goals and the means of achieving them within a specified situation where these decisions should, in principle, be within the power of these actors to achieve."* Policy instruments are the tools which can be used to overcome problems and achieve objectives (Konsult 2010). Vedung (1998) defined *"Public policy instruments*

are set of techniques by which governmental authorities wield their power in attempting to ensure support and effect or prevent social change". They are particular types of policy that can be used in varying degrees or intensities (Deardorff 2010). Many scholars refer to various categories of policy instruments, however, adopting Krott (2005) in general, there are three kinds of policy instruments, i.e. regulatory instruments, fiscal or economic instruments and information instruments. To achieve a certain policy objective, usually two or more policy instruments are implemented.

According to Krott (2005:219) regulatory instruments comprise *"all regulatory political interventions which formally influence social and economic action through binding regulation."* He argued that these regulations determine how certain target groups should act. In forest policy practice, they prevent forest owners and those persons benefiting from forests, from taking action which could harm forest policy objectives.

The economic situation drives a policy making and vice versa, policy making also affects economics, through a set of economic instruments. *"The economic instruments are all those political means of intervention which formally influence social or economic action through the exchange of economic values"* (Krott 2005:191). Adopting Thieme (1995) Krott argued that politics makes direct use of economic values involving money, services, and goods, to regulate action taken by forest owners, as well as the general public.

Besides regulatory and economic instruments, there is another important instrument of policy, namely informational instruments. *"Informational instruments are all those political means of intervention which formally influence social and economic action through information alone."* (Krott 2005:151). He argued that controlling society via information would seem to be taken for granted. In the context of forest policy, compiling and processing data on the forest sector for the purpose of decision making is the characteristic for all stakeholders who are involved in forest policy making.

3.9 Policy Making

In a society, each individual and institution has its fixed place; one member of society supports another in harmony. Interests deviating from the principle of "common welfare" constitute disturbing factors which are to be avoided. The aspiration or postulation of a society, in which all members naturally strive to attain a harmonious whole through reason or moral powers, has characterized political thinking (Dietrich 1953:21; Krott 2005:11). Nature knows no compromise; a good social order can be derived from the laws of nature and the environment to ensure a sustainable economy and society in "partnership and harmony with nature" (Saretzki 1989; Krott 2005:11).

Krott (2005:11-12) argued that there are numerous policy fields formed by individual stakeholders, each with their self-interests in forests. Diverse conflicts characterize the *status quo* where a political order still needs to be found to be able to build upon interests. When interests come together in a world of limited forests resources, conflicts are bound to evolve. Policy-making is one of the diverse methods of conflict resolution. Referring to Lindblom (1968) policy making is *"an extremely complex, analytical and political process to which there is no beginning or end, and the boundaries of which are most uncertain. Somehow a ... complex set of forces that we call policy-making all taken together, produces effects called policies."* Krott (2005:12) defined policy-making as *"a social bargaining process for regulating conflicts of interest. Forest policy is that social bargaining process which regulates conflicts of interest in utilizing and protecting forests according to the programs of the forest sector."*

Policy-making can also be seen as a set of process to make a policy. By means of process, Udoji (1981) argued that policy making is *"the whole process of articulating and defining problems, formulating possible solutions into political demands, channelling those demands into the political systems, seeking sanctions or legitimation of the preferred course of action, legitimation and implementation, monitoring and review (feedback)."* Similar to Udoji approach, Dunn (2000:45) also defined policy-making as a political process consisting of inter-dependent stages of political cycle: policy formation, policy agenda, policy formulation, policy adoption, policy implementation, and policy evaluation.

Through the "social bargaining process," policy making differs from the conflict resolution efforts of individual stakeholders. Policy-making should be limited in the definition to mean the actions of "society as a whole." The measures and tactics of individual enterprises or persons are important, yet they follow such diverse principles that they cannot be considered one and the same as the social bargaining process. They can be summed up under the term of "policy-related action." "Regulation" means that conflicts of interest are swayed in favour of political goals.

3.10 Research Questions

Media discourse can be used as a part of analytical tools for forest policy analysis. Hajer (1995) argued that media discourse represents a specific ensemble of ideas, concepts, and categorizations that is “produced, reproduced, and transformed in a particular set of practices...”. In line with Hajer arguments, Fowler (1996) stated that discourse is a spoken or written communication based on belief, value, and category. They determined a discourse analysis based on the text. Van Dijk and Fairclough suggested a broader discourse analysis by making a bridge from the text into social context (Eriyanto 2005). Thus, after making discourse analysis of the texts concerning forest fire in global and national media, stakeholder interviews were also conducted in this study to compare perceptions of media (texts) and stakeholders (contexts). Following those approaches of discourse analysis, six research questions are formulated.

The first question concerns how the issue of forest fire is constructed in the global and national media. This first question included the analysis of distribution of articles and statements, events, speakers, interest positions, solution of problem, risk evaluation and frames. The second question is about the similarities and differences in the perception of the issue of forest fire in the global and national media. The media perspectives, the role of scientists, scopes of location, interest positions, and frames of the different global and national media are compared. According to the view of Habermas (1998), “power has potential for the formation of a common-will in non-coercive communication” – such as in media (Eriyanto 2005:26). Thus, this second

research question -referring to Habermas- is needed to evaluate asymmetrical information due to the domination of powerful groups of society over media.

The third question discusses the scientific discourse of forest fire. Similar to the first question, distribution of articles and statements, events, speakers, interest positions, solution of problem, risk evaluation and frames are also analyzed. Then, the fourth question has to be answered to understand scientist perceptions, the roles of scientists, determinant factors in scientific discourse, interest positions, and frames of the different global and national scientific journals towards forest fire issue. The analysis of scientific discourses is needed to understand "knowledge utilization". Understanding knowledge utilization is very important because forest fires are complex problems, related to various aspects of environment, socio-economy, and political situations. Therefore, the active role of scientists -according to Dunn- is needed to help decision makers in identifying causes of forest fire as well as in finding the best solutions. It follows the arguments of Dunn (2000) about the importance of knowledge utilization in policy-making.

The fifth question deals with the stakeholder perceptions on the levels of importance of forestry issues, media and policy agenda-setting, positive or negative image of different actors in the perception of stakeholders, solutions to problems, roles of forest fire on global climate change, and problem definition, i.e. economy or ecology. The last question is the comparison between media and stakeholders' perception towards the issue of forest fire, including the role of actors in policy making, causers and causes, and instruments of solution to problems. Analysis of the scientists' role on policy making is highly relevant with the arguments of Pielke (2007) that conclude for the different role of scientists in policy-agenda setting as well as policy-making process. Considering the importance of science in dealing with forest fire problems, the research questions have to answer whether scientists contribute significantly as speaking actors in media and in policy-making, according to stakeholders' perceptions. This study is aimed to evaluate and compare the role of scientists in forest fire discourses according to the perception of media and stakeholders.

This study, therefore, poses a leading research question, i.e. how the issues of forest fire are perceived by different communication levels. To answer the leading question, six questions and several sub-questions (SQs) are formulated as the following.

Question 1: Forest fire discourse in media

How is the issue of forest fire reported in the media?

SQ1-1: Which topic-career of forest fire is in the media?

SQ1-2: What kind of events do media refer to?

SQ1-3: Who are the speakers in the media discourse on forest fire?

SQ1-4: What kinds of interest roles are attributed to the different actors?

SQ1-5: What kinds of solution are mentioned in the news media reporting on forest fire?

SQ1-6: Is forest fire described as a risk issue?

SQ1-7: How are forest fire framed in the media?

Question 2: Comparison of perceptions on forest fire issue between global and national media

What are similarities and differences of forest fire issue in the perception of global and national media?

SQ2-1: What are the kinds of perceptions of global and national media towards forest fire?

SQ2-2: How is the role of scientists in global and national media?

SQ2-3: How are forest fire's issues scoped in the perception of global and national media?

SQ2-4: Which differences of the interest role are attributed to the different actors in global and national media?

SQ2-5: What differences of forest fire issue are framed in the global and national media?

Q3: Forest fire discourse in scientific journals

How is the issue of forest fire reported in the scientific journals?

SQ3-1: Which topic-career of forest fire is in the scientific journals?

SQ3-2: What kinds of events do scientific journals refer to?

SQ3-3: Who are the speakers in the discourses on forest fire in the scientific journals?

SQ3-4: What kind of interest roles are attributed to different actors in the scientific journals?

SQ3-5: What kinds of solution to forest fire are mentioned in the scientific journals?

SQ3-6: Is forest fire described as a risk issue in the scientific journals?

SQ3-7: How are forest fire framed in the scientific journals?

Q4: Comparison of perceptions on forest fire issue between global and national scientific journals

What are the similarities and differences in the perception of forest fire issue in the global and national scientific journals?

SQ4-1: What are the kinds of perception of scientific journals towards forest fire?

SQ4-2: How is the role of scientists in the scientific journals?

SQ4-3: What kinds of factor are determined in the perception of issue of forest fire in scientific journals?

SQ4-4: Which differences of interest roles are attributed to the different actors in the perception of global and national scientific journals?

SQ4-5: Which differences of forest fire issue are framed in the global and national scientific journals?

Question 5: Forest fire discourses in the perception of stakeholders

How is the issue of forest fire perceived by stakeholders?

SQ5-1: Is forest fire an important issue in the perception of stakeholders?

SQ5-2: How is the relation between media and policy agenda-setting in the perception of stakeholders?

SQ5-3: What kinds of image (positive or negative) are attributed to the different actors in the perception of stakeholders?

SQ5-4: What kinds of cause of forest fire are mentioned in the perception of stakeholders?

SQ5-5: What kinds of solution are proposed in the perception of stakeholders?

SQ5-6: Is forest fire responsible for global climate change in the perception of stakeholders?

SQ5-7: How are forest fire framed in the perception of stakeholders?

Question 6: Comparison of perceptions on forest fire issue between media and stakeholders

What are similarities and differences in the perception of forest fire issue viewed by media and stakeholders?

SQ6-1: Which actors play important role in policy-making related to forest fire issue in the perception of media and stakeholders?

SQ6-2: Which causers are mostly perceived in affecting forest fire (human vs. nature) in the perception of media and stakeholders?

SQ6-3: Which causes of problem of the issue on forest fire are perceived by media and stakeholders?

SQ6-4: Which differences of the solutions to problems on forest fire are identified in the perception of media and stakeholders?

SQ6-5: Which differences of forest fire issue are framed in the perception of media and stakeholders?

The questions, variables, sub-questions, and theories used in this study are summarized in the following **Table 3.2.**

Table 3.2. Questions and Variables Based on the Theories

No	Questions	Variables	Sub-questions	Theories
1	How is the issue of forest fire reported in the media?	Articles/Statements	SQ 1-1	Ideas, concepts, & categorizations (Hajer 1995); Discourse, belief, value, and category (Fowler 1996); Discourse & statements (Foucault 1981)
		Events	SQ 1-2	Type of events (Kepplinger,1992); Valence of events (Krumland 2004); Affective attributes of issue – positive, negative, neutral (Coleman & Banning 2006)
		Speakers	SQ 1-3	Scientists as important speaker (Dunn 2000; Pielke 2006)
		Victim/causer/helper	SQ 1-4	Interest positions (von Prittwitz 1999)
		Solution of problem	SQ 1-5	Policy instruments (Konsult, 2010; Vedung,1998; Krott, 2005); Dimensions of interests - ecology, economy, and social factors (Grundmann 1998)
		Risk Evaluations	SQ 1-6	Interests & action orientation (Krott 2005)
		Frame	SQ 1-7	Framing (Semetko and Valkenburg, 2000; McCombs *et al.* 1997)
2	What are similarities and differences of forest fire issue in the perception of global and national media?	Valence of event, country of origin of speakers	SQ 2-1	Affective attributes of issue – positive, negative, neutral (Coleman & Banning 2006); Valence of events (Krumland 2004)
		Role of scientists	SQ 2-2	The role of scientists in policy making (Pielke 2006); knowledge utilization (Dunn 2000)
		Scope of location of events	SQ 2-3	Contexts, purposes & scopes of discourse (Eriyanto 2005)
		Interest position	SQ 2-4	Interest positions (von Prittwitz, 1999)
		Frame	SQ 2-5	Framing (Semetko and Valkenburg, 2000; McCombs *et al.* 1997)
3	How is the issue of forest fire reported of the scientific journals?	Articles/Statements	SQ 3-1	Ideas, concepts, & categorizations (Hajer 1995); Discourse, belief, value, and category (Fowler 1996); Discourse & statements (Foucault 1981)
		Events	SQ 3-2	Type of events (Kepplinger 1992); Valence of events (Krumland 2004); Affective attributes of issue – positive, negative, neutral (Coleman & Banning 2006)
		Speakers	SQ 3-3	Scientists as important speaker (Dunn 2000; Pielke 2006)
		Victim/causer/helper	SQ 3-4	Interest positions (von Prittwitz 1999)
		Solution of problems	SQ 3-5	Policy instruments (Konsult, 2010; Vedung,1998; Krott, 2005); Dimensions of interests - ecology, economy, and social factors (Grundmann 1998)
		Risk Evaluation	SQ 3-6	Interests & action orientation (Krott 2005)
		Frame	SQ 3-7	Framing (Semetko and Valkenburg, 2000; McCombs *et al* 1997)

No	Questions	Variables	Sub-questions	Theories
4	What are similarities and differences in the perception of forest fire issue in the global and national scientific journals?	Valence of event	SQ 4-1	Affective attributes of issue – positive, negative, neutral (Coleman & Banning 2006); Valence of events (Krumland 2004)
		Role of scientists	SQ 4-2	The role of scientists in policy making (Pielke 2006); Knowledge utilization (Dunn 2000)
		Determinant factors in directing discourse	SQ 4-3	Power & non-coercive communication (Habermas 1998); Globalization & cultural imperialism (Tomlinson 1999); Ideology & power (Fowler 1996).
		Victim/causer/helper	SQ 4-4	Interest positions (von Prittwitz 1990)
		Frame	SQ 4-5	Framing (Semetko and Valkenburg 2000; McCombs *et al.* 1997)
5	How is the issue of forest fire perceived by stakeholders?	The importance and contexts of issue	SQ 5-1	Position & importance level of issue (Coleman & Banning 2006); Discourse & social contexts (van Dijk 1985);
		Policy agenda-setting	SQ 5-2	Agenda-setting process (Dearing & Roger 1996; Chaffee & Berger 1987); Agenda setting theory (McCombs & Shaw 1972); The role of scientists in policy making (Pielke 2006).
		Media and "imagination" (negative or positif image) of actors	SQ 5-3	Media & construction of reality (Pan & Kosicki 2001); Media & public opinion (Severin & Tankard 1992).
		Solutions of problem	SQ 5-4	Policy instruments (Konsult, 2010; Vedung,1998; Krott, 2005); Dimensions of interests - ecology, economy, and social factors (Grundmann 1998)
		Forest fire & climate change	SQ 5-5	Policy relevant information (Dunn 2000); cognitive & affective attribute of issue (Coleman & Banning 2006)
		Frame	SQ 5-6	Framing (Semetko and Valkenburg, 2000; McCombs *et al.* 1997)
6	What are similarities and differences in the perception of forest fire issue viewed by media and stakeholders?	Policy making	SQ 6-1	Policy making (Udoji 1981); Policy making & relevant information (Dunn 2000); Policy making & social bargaining process (Krott 2005).
		Causer of problem	SQ 6-2	Interest positions: causer, victim, & helper (von Prittwitz 1990);
		Causes of problem	SQ 6-3	Laws of nature & the environment (Saretzki 1989); interests, psychological & biological needs of humankind (Heinze 1981).
		Solutions of problem	SQ 6-4	Policy instruments (Konsult, 2010; Vedung,1998; Krott, 2005); Dimensions of interests - ecology, economy, and social factors (Grundmann 1998)
		Frame	SQ 6-5	Framing (Semetko and Valkenburg, 2000; McCombs *et al.* 1997)

CHAPTER 4

RESEARCH METHODOLOGY

4.1 The Study Framework

This study has been conducted through the following framework:

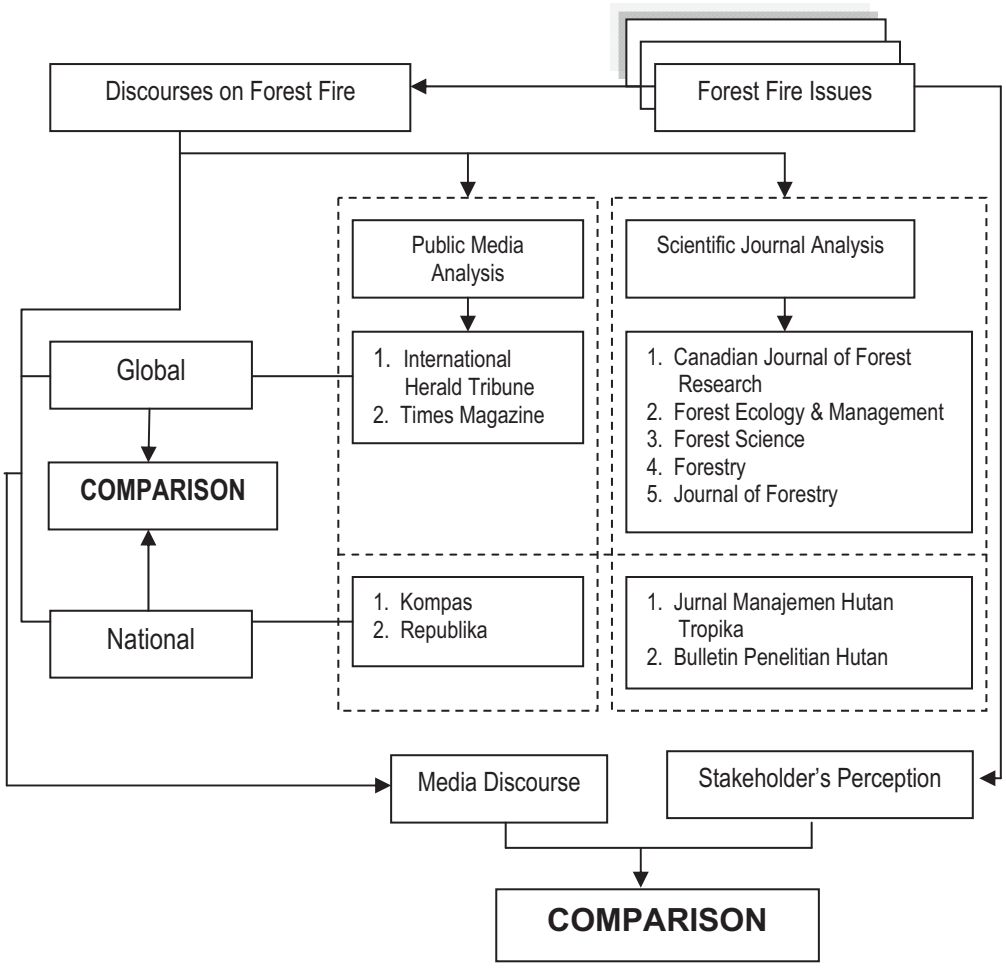


Figure 4.1: The Study Framework

4.2 Why Choosing Indonesia as the Focal Area of Study?

Indonesia is a country that is mostly referred to in the cases of forest fire in media. In Indonesia, forest fire occurs very often, causing a large catastrophe and becoming a very serious problem over cross-national borders. Forest degradation and repeated fires have led to the formation of fire climax grasslands of low productivity and short-return interval fires. Severe problems of environmental degradation such as erosion, loss of nutrients, disturbances of vegetation, smoke and haze are the consequences of fires in these forests.

Forest fire in Indonesia has very specific characteristic, results in a high frequency of fire occurrence and extremely difficult to be addressed, often causes wide-range, cross-national borders impacts. Naturally, some frequent fire islands in Indonesia such as Kalimantan and Sumatra contain burning coals under peatland-surface.

Indonesia is a tropical country and most part of the lands is covered by rain forests. In the rain forest biome, prolonged droughts drastically change the fuel complex and the flammability of the vegetation. Once the precipitation falls below 100 mm per month, and periods of two or more weeks without rain occur, the forest vegetation sheds its leaves progressively with increasing drought stress. In addition, the moisture content of the surface fuel is lowered, while the downed woody material and loosely packed leaf-litter layer contribute to the build-up and spread of surface fires. Aerial fuels such as desiccated climbers and lianas become potential fire ladders, resulting in crown fires or “torching” of single trees (Goldammer 1998).

The specific climatic characteristic of tropical rain forests, especially high humidity and the abundance of peat-soils over Kalimantan and Sumatra created a typical dense “smog” (smoke and fog) fires. This specific characteristic of Indonesian forest fire causes a wider scale, cross-national border impacts, on air pollution and of course, concerns global climate change.

4.3 Analytical Methods and Research Procedures

The study was conducted by the following procedures: first, selecting global public media; second, selecting international scientific journals; third, selecting national public media; fourth, selecting national scientific journals; fifth, developing category system; sixth, making content analysis; seventh, conducting key person interviews and the final step is making comparison between global and national as well as media and stakeholder perceptions concerning forest fire.

4.4 Selecting Media

4.4.1 Global Media

In this study, media are categorized as international media if they have international orientation. The criteria of selected international oriented media include: written in English language, distributed in many countries, and read by a broad range of people from various backgrounds all over the world (not merely a specific community media). Furthermore, the inclusion of topics with a global scope and international actors are most likely expected to occur in international oriented media, i.e. with recipients all over the world. Additionally, a discursive crossing -i.e. statement of opinion of foreign actors on events occurring in other countries (other than in the ownership country of the media) of public spheres can be more easily imagined from such kind of media.

Only few quality newspapers have international orientation, including *Wall Street Journal*, *Financial Times* and *International Herald Tribune* (UNESCO 1997:121). Kleinschmit *et al.* (2007), however, argued that the contents of the first two mentioned newspapers are limited to economic topics. In both media, topics on forestry issues can rarely be expected and only with an economic bias. Unlike the two other newspapers, the *International Herald Tribune* publishes general news and articles; the same as the weekly magazine *TIME*, which are well distributed internationally and concern with international topics[1]. Having considered several candidates that fulfil the criteria of both international

[1] There are different TIME editions, like Europe, TIME Asia, TIME Canada und TIME South Pacific.

oriented media and relevant with the topic of study (forest fire), two international media are selected; namely:

1) International Herald Tribune
2) TIME Magazine

The International Herald Tribune (IHT) has two main editions: the Atlantic Edition and the Asia-Pacific Edition. It is distributed to more than 180 countries and the circulation in the year 2007 was ca. 240.000 exemplars. Most of its readers are highly positioned as senior managers or key corporate decision-makers and two-thirds of them are based in Europe (IHT 2007). Reese (2008) argued that although IHT adapts to regional interests, its appeal mostly comes from the prestige of its parent company, the New York Times. Consequently, it mainly appeals to American citizens abroad, and especially to wealthy decision-makers who travel (Park 2009).

TIME is a weekly magazine, which is distributed world-wide and deals with international topics in its various editions. It has some different editions, i.e. Europe, Asia, North America (Canada), and South Pacific (Australia). The sizes of circulation, however, differ according to regions. The U.S. dominates in the magazine's circulation per issue because of the nationality of Time, Inc. Similar to IHT, the readers of TIME are also highly positioned as professional managers (Time 2007; Park 2009).

4.4.2 International Journals

The international scientific journals were selected from internationally recognized forestry journals. Adopted Real (2008), the process of selection for international forestry journals were mainly based on four criteria:

- The Journal Impact Factor (JIF) for each journal appearing in the section of forestry of the Web of science was gathered for a 10 year time frame (1994-2003), average for this period was calculated and afterwards ranked. Journals which did not have a JIF for any of the 10 years were eliminated from the process of selection.

- Journals had to have English as the main language of publication, as English language is supposed to be the global language of science (Ammon 2001; Crystal 1997). Thus any journal which did not publish in English was not considered.
- Journal had to offer a wide selection of forestry science topics within their pages. Journals which focused on limited topics of forestry science were eliminated from the process of selection.
- The journals selected were the top five rankerd journals, according to the ten year JIF ranking, and which fulfilled all criteria listed above.

Table 4.1 shows the five international journals that were selected for the analysis.

Table 4.1. International Forest Scientific Journals Selected for the Analysis

Journal	Published Since	Topics published
Canadian Journal of Forest Research	1971	All topics of forestry: biometrics and mensuration, conservation, disturbance, ecology, economics, entomology, fire, genetics, management, operations, pathology, policy, remote sensing, social science, soil, silviculture, wildlife and wood science.
Forest Ecology and Management	1976	Articles linked with forest ecology, forest management; applications of biology, ecology, and social knowledge to management and conservation of forests.
Forest Science	1963	Contributions dealing with: silviculture, soils, biometry, diseases, recreation, photosynthesis, and tree physiology, as well as all aspects of managements and harvesting and policy analysis.
Forestry	1927	Aspects of research, practice, and policy that promote sustainable development of forests, woodlands, and trees.
Journal of Forestry	1902	Economic, education and communication, entomology and pathology, fires,forest ecology, geospatial technologies, history, international forestry, measurements, policy, recreation, silviculture, social sciences, soils and hydrology, urban and community forestry, utilization and engineering, and wildlife management.

Source: Real (2008)

The focal issue of this study is forest fire and the analysis is strongly related to forestry in broader aspects, i.e. forest-ecology, -policies, -socio-cultural, as well as -economics. Therefore, the scope of international journals to be selected was focused on forestry issues and read by a broader range of forestry scientists.

4.4.3 National Media

Two Indonesian national daily media (newspapers) have been decided to be studied are:

1) Kompas
2) Republika

The reason for this choice is the newspaper's high circulation. Both newspapers are dailies that offer a broad range of information and have big attention to forest fire issues. Kompas is the most widely read national newspaper in Indonesia, while Republika is one of the biggest national media that has concerns for environmental issues. Kompas and Republika are also two newspapers that lead nation-wide opinions. Both papers have broad readers and usually used as the main references for the public and policy makers.

Kompas is the most widely read newspaper in Indonesia, has published since June 28th 1965 by Kompas-Gramedia Group in Jakarta. It is written in Indonesian and has a reputation for high-quality writing and investigative journalism. Moreover, Nuryadi (2003) reported that Kompas is one of the most balances, accurate, clear and objective national media referring to the articles concerning environment. Kompas began publication with an initial circulation of 4,800 copies. Since 1969, it has been the largest national newspaper in Indonesia. Recently, its daily circulation has reached approximately 530,000 copies.

The paper was first suggested by Ahmad Yani (a military general), when he suggested Frans Seda (a catholic's politician) to publish a newspaper that was balanced, credible and independent. Seda sounded out the idea to his friends, P.K. Ojong and Jakob Oetama. Ojong subsequently agreed to undertake the project and Oetama became its first editor-in-chief. The publication was initially

named Bentara Rakyat (People's Herald). Due to the suggestion of the first President of the Republic of Indonesia, Sukarno, it was renamed to Kompas referred to "compass", a direction-finding instrument.

Beside Kompas, Republika is another most important newspaper in Indonesia (Subiakto 2000). Republika was established on January 4th 1993, aiming to accommodate Moslem community's aspiration in a national discourse perspective which creates pluralism of public information. Since majority of Indonesian people are moslem, Republika has become an important reference for the public and policy makers. In 1995, Republika became the first newspaper in Indonesia which developed an internet publication service with a website called Republika Online or www. republika.co.id. Furthermore, Republika also became the first publisher that implement the teleprint system in 1997. In 1994, PT. Republika Media Mandiri joined PT. Abdi Bangsa Tbk. Business Group (Mahaka Media 2009).

With its motto of *"Pegangan Kebenaran"* (Truth Guidance), Republika shows its passion in preparing Indonesian community to enter the new era, the transformation era to the intimate and democratic life aspects of politics, economy, social, and culture. Republika is the biggest Moslem community national newspaper in Indonesia with 253.000 readerships which 81% of them are loyal subscribers (Mahaka Media 2009).

Kompas and Republika are chosen in this study because they fit to the criteria of nation-wide reader, broad-scope news, and important references for the public and policy makers.

4.4.4 National Journals

This study has decided to choose two national journals to be studied, these are:

1) *Jurnal Manajemen Hutan Tropika*
2) *Bulletin Penelitian Hutan*

Those national journals fit to this study due to the criteria of having nation-wide readers, containing broad aspects of forest science and published periodically

within more than ten years. The *Jurnal Manajemen Hutan Tropika* (The Journal of Tropical Forest Management) is a scientific journal published by Department of Forest Management, Faculty of Forestry Bogor Agricultural University – one of the biggest and oldest forestry higher education institutions in Indonesia. The journal covered scientific articles and conceptual ideas on the field of forest planning, forest policy, forest resource utilization, silviculture and forest ecosystem management. It was established in June 1986 with the name of "Technical Notes", published twice a year. In January 1995, the name of "Technical Notes" was changed into the Jurnal Manajemen Hutan Tropika, registered in the Center for Scientific Documentation and Information, the Indonesia Science Institute (LIPI) with ISSN: 2087-0469. This journal has nation-wide readers and contains broad aspects of forest science. Since 2006, this journal published three times a year and in 2007 collaborated with the Indonesian Forestry Scholar's Association (PERSAKI) for a join publication. It is one of the peer-reviewed forestry journals in Indonesia with national-wide scope of readers and published periodically, accredited by the Directorate General of Higher Education No. 134/Dikti/Kep/2001 and 23a/Dikti/Kep/2004.

The *Bulletin Penelitian Hutan* (the Journal of Forest Research) is a scientific journal published by the Forestry Research and Development Agency (FORDA), Ministry of Forestry of the Republic of Indonesia. This journal was published firstly in the year of 1984, covering broad aspects of forest science i.e. silviculture, forest botany, forest resource conservation, soil and water conservation, forest protection, and forest biometrics. Historically, the initial form of this journal was "a scientific announcement" published in 1915 by Dutch Administration and changing with some different form" such as "report" (1948-1977), "brief" (1977), 'technical info" (1984), "bulletin" (1984-2004). Since 2004 the name of the journal "forest research bulletin" has been changed with a new name "the journal of forest research and nature conservation". This journal is published by the center of state forestry research agency in Indonesia; therefore, the scope of its readers covers a national-wide.

4.5 Content Analysis

Content analysis is a social science methodology that studies the content of communication and commonly used to analyze recorded transcripts of interviews with participants, reports, news, or written publications. This kind of analysis is closely related to and often included under the general rubric of "qualitative analysis". However, recently content analysis has also used "quantitative analysis" primarily in the social sciences and it is defined as "a systematic, replicable technique for compressing many words of text into fewer content categories based on explicit rules of coding" (Stemler 2001:1).

It often involves building and applying a fixed vocabulary of terms on the basis of which words are extracted from the textual data for concordant or statistical computation. Referring to Lasswell (1964) there are some core questions of content analysis; namely:

- who says what,
- to whom,
- why,
- to what extent, and
- with what effect.

The method of content analysis enables a researcher to include large amounts of textual information and systematically identify its properties. A quantitative-qualitative content analysis has been chosen as the adequate method to carry out the discourse analysis. According to Bos and Tarnai (1999) texts are generally the exclusive subjects of content analysis. It includes all sorts of texts from newspaper articles to transcripts of interviews. They also argued that "the basic assumption of all content analysis is that cultural forms of expression in the broadest sense can be expressed in texts, which means that the content analysis of texts is concerned with *social reality* and that the results of the analysis and their interpretation are correspondingly dependent."

4.5.1 Developing Category System

To make a content analysis, all comments on fragments of a text should be framed in terms of theoretically based categories of structure or strategy, and hence, presuppose knowledge of classical theories as well as new developments in the field (van Dijk 1991). The most important stage to initiate content analysis is, therefore, developing a category system. The category system has been discussed and developed together by a research group of forestry media at the Institute of Forest Policy and Nature Conservation, University of Goettingen. Developing a coding of category system is a very important step to conduct content analysis of respective media as well as scientific journals. The coding of category system had been completely developed using SPSS program. Data have been collected from **a ten-year time series** of two global public media, five international journals, two national public media, and two national journals.

All articles and statements are evaluated for their formal characteristics through a quantitative-qualitative content analysis, using a category system. The category system is subdivided into groups of categories. According to Holsti (1969) there are five important requirements for categories in content analysis, i.e. first, categories shall adequately reflect the investigator's research question; second, categories must be exhaustive - all coding items have to be capable of being placed into a category; third, categories must be mutually exclusive – no content datum can be placed in more than a single cell; fourth, categories have to be independent – the assignment of any data into category must not affect the classification of the other data; and fifth, each category shall be derived from a single classification principle.

In this study, the articles are evaluated based on the categories of "formal information" and "event", consisting of "type", "valence", and "location" of event. The "location of the event" variable is categorized as "global", "regional", "national" and "local" by the scope of the reported event. The statements, however, are divided into categories of "speakers", "interest positions", "risk evaluations", "causes of problem", "solutions of problem", "instruments of solution, and "frames". The attributes of the variable "speakers" were then

subdivided further to allow examination on which type of actor 'has a say' (speaks) in the respective media (**Table 4.2**).

Table 4.2. Category System

Unit of Analysis	Category	Subcategory
Articles	Formal Information	Coder Articles number Case number Newspaper/Journal source Date Author Style of the articles
	Event	Type of event Valence of event Location of event
Statements	Speakers	Scientists Non-scientists: - Politicians - Administrations - Media - NGOs - Organizations - Enterprises - Others
	Interest Positions	Victims Causers Helpers
	Risk Evaluation	Probability of occurence Resources damage Location Mobilization Potential
	Causes of Problem	Accidental causes Inadvertent causes Mechanical causes Intentional causes Others
	Solutions of Problem	Economics Social Ecological
	Instruments of Solution	Economic instruments Informational instruments Procedural instruments Planning instruments Regulative instruments Praxis Others
	Frames	Problem definition between economy and environment Causal interpretation of forest fire between human and nature factors Impact evaluation about role of forest fire in climate change Effective regulation on forest fire: national or international

Following Dunn (2000) and Pielke (2007), who argued for the importance of "knowledge utilization" and "role of scientists in policy-making, one aim of this study is to investigate the contribution of scientists in forest fire discourses. Therefore, "speakers" in this study are categorized into two main groups: "scientists" and "non-scientists". Then, the "non-scientist's speakers" are divided into sub-groups, namely: "politicians", "administrations", "media", "non-governmental organizations", "organizations", "enterprises" and "others". The category of "politicians" consider, both "government politicians" and "non-government politicians"[2]. Additionally, nationality is captured under the variable "speakers". The operationalization of the status and resources of nations is completed through a classification into either high-income, middle-income, and low-income countries following the criteria of the World Bank (2004).

4.5.2 Coding

Holsti (1969) defined coding as the process whereby raw data are systemically transformed and aggregated into units that permit the precise description of relevant content. A central part of the research design is coding rules, which serves as the operational connection between data, theory, and research questions.

In this study, the scope is defined as the level of the area affected by the event from the perspective of the speaking actors in the articles. The event is coded as "global" if the whole world is involved, "regional" if it is only relevant to certain region and "national" or "local" if they are described as occurring in a single nation or a specific place within a country, respectively (Kleinschmit *et al*. 2007).

The unit of analysis for categorizing the speaker is the statement. Statements, which are identified as relevant for coding, are single verbal messages from actors speaking in the article (Gerhards *et al.* 1998). Thus, in one article more than one message (statement) can be coded. Relevant for coding are statements referring to forest fire issues in the respective public media and scientific journals.

[2] *Belonging to "government politicians" or to "non-government politicians" depends on whether she/he has been elected by popular vote or not respectively.*

An actor can make a statement in either a direct or indirect speech. It has to be taken into consideration that the media themselves can appear as speakers. Furthermore, the unit of analysis for the categorization of “locations of event” is the whole article, because the place directly refers to the reported event which is the basis for the article. The coding proceeds are supported by computer. This means that data are directly entered in a developed SPSS-mask. During the analysis, continued tests prove the reliability of the coding persons.

4.6 Stakeholder Interviews

Stakeholder (key person) interviews were carried out in relevant institutions at the international (and regional), national, and provincial levels. The interview aims to understand the differences of perception between media and stakeholders concerning forest fire issues. Key person’s interview involves detailed questions to only relatively few persons in a certain location, which is relevant to the study theme. According to Kirk and Mai (1997:33), there are some advantages of key person interviews:

- It provides deeper and more detailed analysis.
- It probes deeply into the behaviour and the interrelationships among people or between people and institutions.
- It helps to establish and to explain attitudes and beliefs of person or people.
- It shows why certain behaviour occurs in certain situation.

The interview is aimed to get a sharper and deeper analysis to compare media and stakeholders’ perception by searching the arguments as well as identifying exceptions to the general conclusion in conditional cases of forest fire issues. It is also proposed to result more reliable conclusions and enable more relevant recommendations. Such interview, moreover, is expected to reveal the perceptions of stakeholders.

Primary data were gathered from interviews with key persons from forest-related institutions at the international, regional, national and provincial levels. There were two types of questionnaires used in the interviews. The first type

was a semi-structured questionnaire, which was used for key person interviews. These questions provided only general guidelines of the question's topics with emphasis on qualitative data. The key person interviews were mostly conducted by personal discussions using open questions in order to understand the perceptions of various stakeholders towards forest fire and forest fire issues in media.

The second type of questionnaire is a structured one, used for measuring the perception, awareness, or cognitive level of respondents towards causes of forest fire and efforts to reduce forest fire. This provides detailed questions using close-questions and semi open-questions. These interviews were carried out in November 2008 to June 2009.

A number of key persons representing institutions at the international, regional, national and provincial levels were interviewed. The choice of person for each interview was determined using the 'snowball method'. Bryman (2001:98) holds that by using this method, further interview partners were selected by considering the recommendation of the former interview partners. To limit the number of interview partners in certain institutions, a quota control could be applied. In snowballing method, it is also important to ensure that each important stakeholder is represented; however, the final choice of whom to be interviewed depends on the interviewer's judgment. According to Kirk and Mai (1997:12), to design a quota sample, the researcher has to know at least the approximate conditions of the target group (institution) according to the research objectives.

The selection of institutions and key persons in which and with whom the interview were conducted, was based on the relevance to the research topic and the principle of the representativeness. At the international and regional level, several experts from Centre for International Forestry Research (CIFOR), ASEAN-Korea Cooperation (AKECOP), ASEAN Secretariat, and SEAMEO-BIOTROP were interviewed. Interviews were conducted with ASEAN institution because they are highly relevant with forest fire issues in Indonesia, since there are many cross-country borders' problems of forest fires within ASEAN countries, such as smoke. At the national level interviews were conducted with

policy makers at the Ministry of Forestry (MoF), scientists at Bogor Agricultural University (IPB), NGO (LATIN) activists, and forest enterprises (KBT, KL, and PK). At the provincial level, interviews were conducted in seven provinces:

1) Riau
2) East Kalimantan
3) West Java
4) North Sulawesi
5) Bali
6) Bangka Belitung
7) Yogyakarta

This interviews are important to understand, how important forest fire is, based on stakeholder perception from the different characteristics of provinces in Indonesia. Key person interviews in the provinces of Riau, East Kalimantan, and West Java were focused to identify the causes and impacts of forest fire, since those provinces were the main and potential locations of forest fires in Indonesia. While in the less potential occurrence of forest fire, i.e. provinces of North Sulawesi, Bali, and Special Region of Yogyakarta, interviews were focused to understand the perceptions of stakeholders, related to the importance of forest fire issue in the respective regions (**Appendix 1**).

4.7 Discourse Analysis

Variation of perceptions among different media could occur because of their different roles and goals. Roles refer to the “function” of media, whether they are public or scientific media. Goals, on the other hand, usually refers to the target of news or reports as well as “ideology” of media. Beside roles and goals, gaps in interests among media could also be caused by different cognition of the journalists or resource persons. Therefore, actors behind the news or reports are also very important in determining the “colour” of issues in a media. Referring to van Dijk in Eriyanto (2005), with regard to the dimension of a text, a discourse study on text structure and strategy is used to determine certain theme. In the social cognitive dimension, a discourse study should understand the process of making texts in news production which involves both

individual and journalist cognitive. In the dimension of context, a study on the discourse is usually developed in a society towards or to address a certain problem. **Figure 4.2** shows the dimensions of media discourse according to the theory of van Dijk in Eriyanto (2005).

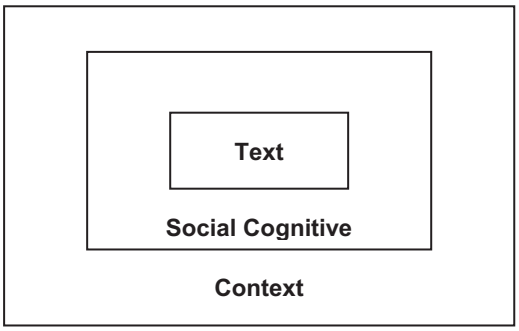


Figure 4.2. Dimensions of Media Discourse

Figure 4.2 shows that there are three dimensions of media discourse i.e. text, social cognitive, and context. Understanding social cognitive (van Dijk) or discourse practice (Fairclough) is obligatory as it is the only way to bring a text into context. Therefore, a "meso analysis" on social cognitive or discourse practice is required to conduct discourse analysis (Eriyanto 2005). "Meso analysis" was partly used in this study and therefore in-depth interviews with various stakeholders were conducted. The following **Table 4.3** shows the methods to conduct three levels of discourse analysis.

Table 4.3. Methods to Conduct Discourse Analysis

Levels of analysis	Methods
Texts	Critical linguistics
Social cognition* or discourse practice**	In-depth interview***
Social analysis* or socio-cultural practice**	Literature review or historical review

Note: * van Dijk, ** Fairclough (Eriyanto 2005), *** used in this study

4.8 Comparative Analysis

Comparison is a universal method in the social sciences. Hartmann (1995) stated that there are some key terms in comparative approach that are important to be considered as a focus of analysis, i.e. institutions, state, democratic system, policy, political culture, third world, and regional regulations. In comparative approaches, many theories are useful and might be applied for syntheses, but the best studies find their inspiration from contradictory and multiple cases. In this study, contradictory situations could be found in the results of global and national media, low and high income countries, as well as public and scientific media discourses. While choosing multiple locations (different provinces) for key person interviews was intended to get better results of stakeholder's perception.

4.8.1 Comparison between Global and National Media

In this study, comparison of media results was conducted by comparing statements in the global and national media as well as in the scientific journals and public media. The categories of statement analyzed are:

- Speaking actors
- Locations of event
- Interest positions
- Risk evaluation
- Causes of problem
- Solutions of problem
- Intruments of solution
- Frames

4.8.2 Comparison between Media and Stakeholder's Perception

To facilitate comparisons from one research setting to another, social scientists frequently calculate the correlation between the ranking of issues on the media and the ranking accorded the same issues based on stakeholder's perception. This quantitative measure provides a substantial degree of precision for the

comparisons. The comparisons between how issues are ranked on media and how the stakeholder ranks the importance of these same issues could be applied. That reflects a substantial degree of influence (McCombs 2002:3). In this study, comparison was conducted by comparing statement of media and stakeholder's perception according to the following frames:

- Problem definition of forest fire: economy vs. environment
- Main cause of forest fires: human vs. nature factors
- Impact evaluation of forest fires: responsible vs. not responsible for global climate change
- Effective regulations on forest fires: national regulations vs. international conventions.

CHAPTER 5

RESULTS AND DISCUSSIONS

5.1 Media Discourse on Forest Fire

This section discusses forest fire discourses in global and national media, in Indonesia. Speakers' perspectives and asymmetries on forest fire related information at both the global and national levels will be identified through the analysis of these forest fire discourses.

5.1.1 Global Media Discourse on Forest Fire

The global media discourses on forest fire were analyzed from two international (news) media, i.e. International Herald Tribune (IHT) and Time Magazine (TM). The International Herald Tribune is a daily newspaper, published six days per week, while Time is a weekly magazine. Both of these media reported events related to forest and environment. Specifically for Time Magazine, these events were written under its Environment and Nature section.

5.1.1.1 Distribution of Articles and Statements

A total of 360 statements and 86 articles on forest fire were analyzed from global news media. The International Herald Tribune reported 44 articles and 237 statements, which is higher than Time Magazine with 42 articles and 123 statements (**Table 5.1**).

Table 5.1. Number of Articles and Statements on Forest Fire in Global Media

Source	Articles		Statements	
	n	%	n	%
International Herald Tribune	44	51.16	237	65.80
Time Magazine	42	48.84	123	34.20
Total (N)	**86**	**100.00**	**360**	**100.00**

Note: % = n/N, n= number of article in the respective media, N= 86 (total number of articles) and 360 (total number of statements)

In general, an issue will be covered by the media if such issue is a hot topic or a topic in progress (ongoing topic). This is also applied with the issue of forest fire. Forest fire issue was covered by many global media, since at the time of incident, it was attracting quite large worldwide attention, or produced impacts across the country such an issue, could be categorized as a global issue.

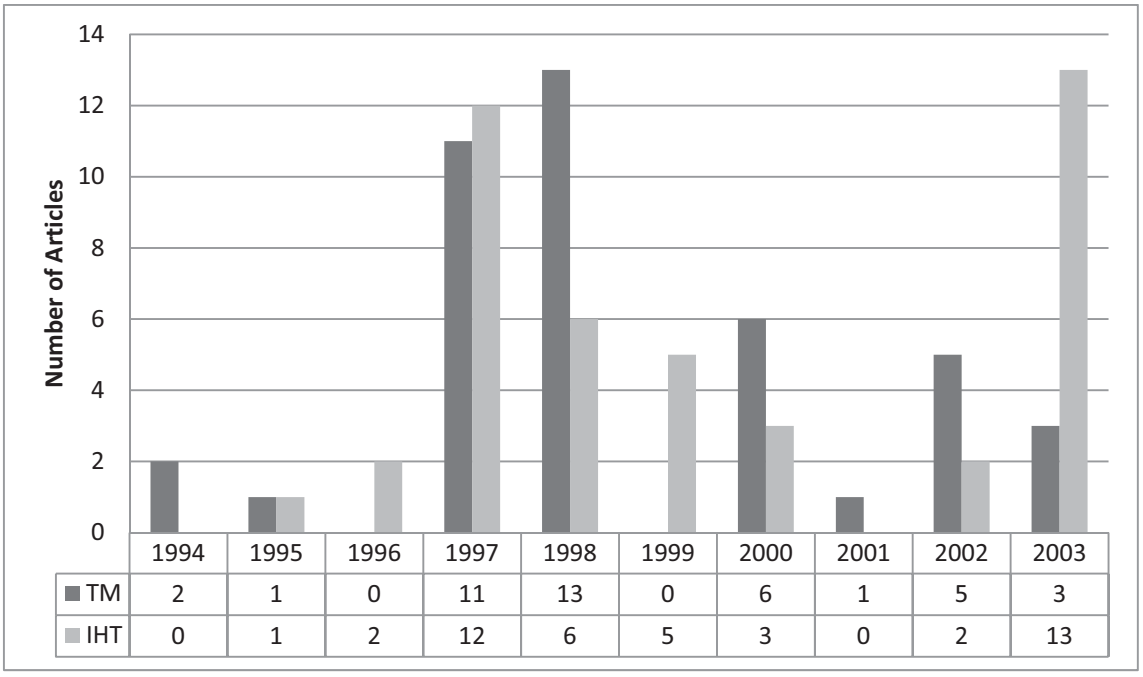
Figure 5.1 shows the fluctuations in the number of forest fire-related articles published by the International Herald Tribune and Time Magazine for the period of 1994-2003. It indicates that many articles on forest fire were reported by global media in 1997 and 1998. The number of articles on global forest fire in the media tent to decline through 2001 and increased again in 2003. This was related to the occurrence of large forest fires in Kalimantan, Indonesia in the years of 1997 and 1998.

The large number of articles on forest fire in Indonesia reported in global media was related to the trans-boundary implications of the fires. Haze from the forest fires resulted in air pollution which not only threatened the health of the people of Kalimantan, Indonesia but also the neighbouring countries, as well as the resulting ecological and economic losses within these areas. The following excerpts were taken from two reported global news on forest fire with cross-border impact:

> *"President Suharto of Indonesia apologized Tuesday for a series of uncontrolled fires that have blanketed **a large part of Southeast Asia** in*

smoke that traps pollution and threatens the health of millions of people." (IHT, September 17, 1997).

"The fires raging in Indonesia have resulted in serious air pollution not only for some 20 million people in Indonesian Kalimantan and Sumatra but also for many millions more in ***Malaysia, Singapore, Brunei and part of the southern Philippines and Thailand.****"* (IHT, October 13, 1997).



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
TM	2	1	0	11	13	0	6	1	5	3
IHT	0	1	2	12	6	5	3	0	2	13

Figure 5.1. Number of Forest Fire Articles in Global Media 1994-2003

Indonesia's forest fires were perceived as serious threats to the neighbouring countries, especially Southeast Asia. Therefore, the Environmental Ministers from the Association of South East Asian Nations (ASEAN) believed it was necessary to hold a meeting in Kuching, Malaysia to further discuss the matter.

"The meeting noted that ***the fires in east Kalimantan are of serious concern*** *because of the prolonged dry weather and welcomed any immediate international assistance, especially in enhancing fire-fighting capacity"* (IHT, February 26, 1998).

Until 1999, Indonesia's forest fires were still a global issue although the reports were not as much as those in the previous years.

"For the third year in a row, fires are blazing across parts of Indonesia. Thick clouds of smog have affected inhabitants of Kalimantan and Sumatra. When the

*winds blow from the South, **as they often do at this time of year, the haze blankets Brunei, Malaysia, Singapore and reaches other parts of Southeast Asia**."* (IHT, August 31, 1999).

Most of the locations of forest fire events reported in both media were in Indonesia. The existence of a prolonged summer due to the El Nino resulted in the widespread impacts and prolonged forest fires. Until 2002, there were still many forest fire-related articles published in global media (**Figure 5.2**).

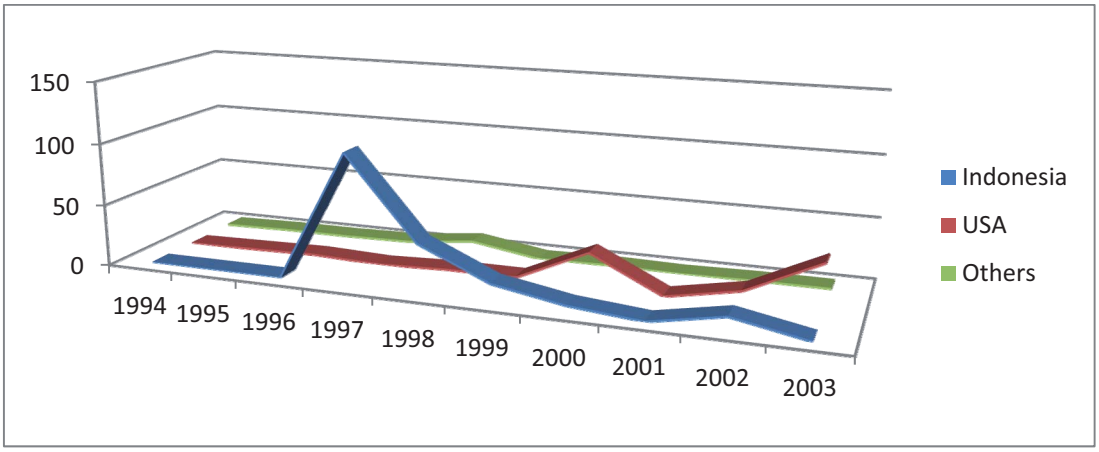


Figure 5.2. Locations of Events of Forest Fire Issues in Global Media 1994-2003

In 2003, several European countries experienced a summer with high temperature and long drought that resulted in severe fires, including in forest areas. This phenomenon made coverage in much global news, especially in the IHT.

> *"Usually high temperatures and a summer-long dearth of rain have wrought serious damage to crops and weather related deaths **throughout Europe**, a continent of increasingly scorched earth."* (IHT, August 6, 2003)

> *"Around **the city of Bradenburg, in eastern Germany**, officials were barring people from entering forest in an effort to prevent fires. The summer drought had contributed to 300 forest fires in that area this year, officials said."* (IHT, August 6, 2003).

5.1.1.2 Events

In this study, forest fire events were analyzed according to the “type”, “valence”, and “location” of event. The media articles included various types of events. Kepplinger (1992) classified the events into three types based on the cause, i.e. genuine, medialized, and staged events. **Genuine events** were completely independent of press coverage, e.g. forest fires could occur even without the coverage of the press. **Medialized events** were events that probably would occur even without the press coverage but hold some sort of media interest, e.g. the annual report on the state of the forest, press conference over a certain theme, reports about conferences, seminars etc. **Staged events** were events, whose occurrence were provoked by press coverage and would probably not take place without this coverage, e.g. environmental demonstrations and campaigns: staged or produced events and invited the press for coverage.

Based on its balance, Krumland (2004) classified events into three groups: positive, negative, and ambivalent. **Positive events** referred to a positive orientation of the articles, e.g. problem solving, technical development, scientific discovery, etc. **Negative events** referred to a negative orientation of the article, e.g. wars, disasters, conflicts, crisis, etc., whereas **ambivalent events** referred to both orientations.

Within the global media, both Time Magazine and the International Herald Tribune generally considered a forest fire as a "genuine event" with a "negative" valence. Almost all of the selected articles argued that forest fire was a real event even at the time of the news coverage. Without publication and medialization through media, forest fire events would still occur and attracting worldwide attention due to the negative effects of forest fires that were felt beyond local boundaries, in particular the case of forest fires in Kalimantan, Indonesia where the resulted smoke disturbed the neighbouring countries. **Table 5.2** shows the types and valence of events in global media.

Table 5.2. Types and Valence of Events of Forest Fire Issues in Global Media

	Source				Sum	
	Time Magazine		The International Herald Tribune			
	n	%	n	%	n	%
A. Type of Events						
Genuine	42	100.00	41	93.18	83	96.51
Medialized	0	0	2	4.55	2	2.33
Staged	0	0	1	2.27	1	1.16
Total	**42**	**100.00**	**44**	**100.00**	**86**	**100.00**
B. Valence of Events						
Positive	2	4.76	2	4.55	4	4.65
Negative	39	92.86	40	90.91	79	91.86
Ambivalent	1	2.38	2	4.55	3	3.49
Not recognizable	0	0	0	0	0	0.00
Total (N)	**42**	**100.00**	**44**	**100.00**	**86**	**100.00**

Note: % = n/N, n= number of article in the respective media, N= 42 (number of articles in TM), 44 (number of article in IHT), and 86 (total number of articles).

Almost all of the valences of events were "negative" because the media reported many damages and losses resulting from the fires. Only a few which had "positive" valence of event i.e. informing the efforts to prevent forest fire by involving forest communities and the foreign ministers of ASEAN member countries have an agreement on future mitigation and disaster management of forest fire. Furthermore, "ambivalent" valence of events referred to both positive and negative valences. For example, at the beginning, the article discussed the damages and losses caused by forest fires, but at the end of the article, the reports were on the efforts that could be done to repair the damages, since basically forest is a renewable natural resource.

Apart from the type and valence of events, scopes of event were also analyzed. The scopes of the event were categorized as “global”, “regional”, “national”, and “local”. The scope was defined as the level of the area affected by the event based on the perspectives of the speaking actors in the articles. “Global” was selected when the entire planet referred to as being involved in the issue. “Regional” was used when specific regions of the world were mentioned, e.g. countries form North America, South America, Europe, Asia, etc. “National” was

used when specific countries were mentioned, e.g. Indonesia, Germany, etc., and “local” was used when the issue deals with a specific region of a specific country, e.g. Kalimantan, Indonesia.

Although IHT and TM were considered as global news media, but in the case of forest fire discourse, the scopes of event that were written tend to be more “national” and "local" rather than "global" and "regional" (**Table 5.3**).

Table 5.3. Scope of Event of Forest Fire Issues in Global Media

Scopes of Events	Sources				Sum	
	Time Magazine		The International Herald Tribune			
	N	%	n	%	n	%
Global	8	19.05	3	6.82	11	12.79
Regional	4	9.52	4	9.09	8	9.30
National	8	19.05	19	43.18	27	31.40
Local	20	47.62	18	40.91	38	44.19
Not recognizable	2	4.76	0	0.00	2	2.33
Total (N)	**42**	**100.00**	**44**	**100.00**	**86**	**100.00**

Note: % = n/N, n= number of article in the respective media, N= 42 (number of articles in TM), 44 (number of article in IHT), and 86 (total number of articles)

Only few articles on forest fire in global news media discussed a “global scope”. In this study, “the scope of event” refers to a level on which the event or problem is taking place. If the actor refers to the issue on a scale dealing with the whole world, it is categorized as “global scope”. The following quotation from the International Herald Tribune gave an example of the “global scope of event” in media discourse:

> **“***But with Borneo now choking in haze -and thousands of residents sick from pollution- officials on the Malaysia side of the island are increasingly angry and frustrated.* ***The world*** *is only watching ...*” (IHT September 27, 1997).

In addition to the scope of event (global, regional, national, and local), the distribution of location of event could also be viewed on the basis of the country distribution. The countries of event were coded and categorized into "high-

income", "middle-income", and "low-income" countries according to the country classification criteria given by the World Bank (2004).

In this study, statements on forest fire from high-income countries published in global media came from Australia, Canada, France, Greece, Italy, Spain, and USA. Whereas statements from middle income countries found in global media were related to forest fires that occurred in Brazil, Indonesia, Mexico, and Peru (**Table 5.4**).

Table 5.4. Countries of Event of Forest Fire Issues in Global Media

Countries	Sources				Sum	
	Time Magazine		The International Herald Tribune			
	n	%	n	%	n	%
High Income	**13**	**30.95**	**15**	**34.09**	**28**	**32.56**
Australia	1	2.38	0	0.00	1	1.16
Canada	1	2.38	1	2.27	2	2.33
France	0	0.00	2	4.55	2	2.33
Greece	1	2.38	0	0.00	1	1.16
Italy	1	2.38	0	0.00	1	1.16
Spain	0	0.00	1	2.27	1	1.16
USA	9	21.43	11	25.00	20	23.26
Middle Income	**16**	**38.09**	**21**	**47.73**	**37**	**43.02**
Brazil	4	9.52	0	0.00	4	4.65
Indonesia	10	23.81	21	47.73	31	36.05
Mexico	1	2.38	0	0.00	1	1.16
Peru	1	2.38	0	0.00	1	1.16
Not recognized	13	30.95	8	18.18	21	24.42
Total (N)	**42**	**100.00**	**44**	**100.00**	**86**	**100.00**

Note: % = n/N, n= number of article in the respective media, N= 42 (number of articles in TM), 44 (number of article in IHT), and 86 (total number of articles)

Table 5.4 shows that most countries of events of forest fire written in TM were located in "high-income countries", especially the USA. Whereas IHT contained more issues of forest fire that occurred in "middle-income countries", especially Indonesia.

5.1.1.3 Speakers

Speakers are the actors whom directly and indirectly spoke out in the articles. One of the very important speakers was the "scientists" due to their very important roles in the policy making process (Dunn 2000; Pielke 2006). To examine the extent of scientists' role in a forest fire discourse in global media, speakers in this study were differentiated into "scientists" and "non-scientists", where "non-scientists" were classified into seven groups, namely: "politicians", "administrations", "media", "NGOs", "organizations", "enterprises", and "others" (**Table 5.5**).

"Politicians" consisted of "government politicians", meaning all actors that have been elected to form parts of the government (e.g. President, Prime Minister, Mayors, Senators, Congressman/woman, etc), and "non government politicians", included actors that were involved in politics but had not been elected by the public, like the head of political parties. "**Administrations"** referred to all actors originated from the administrative body of the government, e.g. ministers, public representatives, government, state, city, local authority, countries, etc., including "forest and non forest administrations". To identify the role of media as speaking actors, journalists or other members from the media that were analyzed in this study (IHT and TM) and journalists from other media were coded as "**media"**. All actors from forest enterprises were coded as "Forest Enterprises", including wood and paper industry sectors. Meanwhile, all actors from other non forest enterprises were coded as "Non Forest Enterprises". Both of these speakers belonged to **"enterprises"** category.

The study emphasized **to evaluate the different role of forest and non-forest speakers** (scientists, administrations, organizations, NGOs, and enterprises). Therefore, the category of **"organizations"** was also divided into forest and non forest organizations. "Forest organizations" referred to all actors representing or belonging to forest organizations (including international forest organizations), such as CIFOR and ICRAF. "Non-Forest Organizations" referred to all actors of non forest organizations, e.g. United Nation (UN), Food and Agricultural Organization (FAO), International Monetary Fund (IMF), World Bank (WB). "**NGOs"** comprised forest and non forest NGOs, including profit and non-

profit organizations. The speaking actors that did not belong to any of the previous categories were coded as "**others"**.

Table 5.5. Speaking Actors of Forest Fire Issues in Global Media

Speaking Actors	Time Magazine		International Herald Tribune		Sum	
	n	%	N	%	n	%
A. Scientists	**20**	**16.26**	**22**	**9.28**	**42**	**11.67**
a. Forest science	2	1.63	2	0.84	4	1.11
b. Non forest science	10	8.13	14	5.91	24	6.67
c. Not Recognizable	8	6.50	6	2.53	14	3.89
B. Non Scientists	**103**	**83.74**	**215**	**90.72**	**318**	**88.33**
1. Politicians	**2**	**1.63**	**7**	**2.95**	**9**	**2.50**
a. Politicians / government	2	1.63	7	2.95	9	2.50
b. Politicians / non government	0	0.00	0	0.00	0	0.00
2. Administration	**12**	**9.76**	**65**	**27.43**	**77**	**21.39**
a. Forest administration	5	4.07	9	3.80	14	3.89
b. Non forest administration	7	5.69	56	23.63	63	17.50
3. Media	**36**	**29.27**	**45**	**18.99**	**81**	**22.50**
4. NGO	**1**	**0.81**	**3**	**1.27**	**4**	**1.11**
a. Forest NGO	0	0.00	0	0.00	0	0.00
b. Non Forest NGO	1	0.81	3	1.27	4	1.11
5. Organization	**11**	**8.94**	**35**	**14.77**	**46**	**12.78**
a. Forest organization	0	0.00	3	1.27	3	0.83
b. Non forest organization	11	8.94	32	13.50	43	11.94
6. Enterprises	**1**	**0.81**	**3**	**1.27**	**4**	**1.11**
a. Forest enterprises	1	0.81	0	0.00	1	0.28
b. Non forest enterprises	0	0.00	3	1.27	3	0.83
7. Others	40	32.52	57	24.05	97	26.94
TOTAL (N)	**123**	**100.00**	**237**	**100.00**	**360**	**100.00**

Note: % = n/N, n= number of speakers in the respective media, N= 123 (number of speakers in TM), 237 (number of speakers in IHT), and 360 (total number of speakers)

"Non-scientist speaking actors" spoke more frequently rather than "scientists" since TM and IHT are public media, not scientific media. As a weekly magazine,

TM with its special section on environment has brought up more scientists as speakers more than IHT. Although there were very few scientists who spoke in public media, the number was higher than "enterprises", "politicians", even "NGOs". Most of the scientists who spoke about global forest fire in the media were the "non-forest scientists". This was because most of the issues raised were indirectly related to forest management issues, but had more relevance to the causes or effects of forest fires that were indirectly related to forest science as a social problem, climate, or the handling of victims of fires.

The category of “others” was present because the individuals or communities around the forest fire occurrence were often asked their opinions by the media about the chronology of events, impacts and losses from the forest fire. "Media" and "administrations" appeared as the second most speakers. In this case, “**non-forest administrations”** appeared more frequently than the forest administrations as found in the following quotation in a global media.

> *“Fueled by drought and forests dry as “kindling,” wildfires have burned 2.3 million acres in the United States this year – three times the normal amount,* ***Secretary of Agriculture*** ***Dan Glickman*** *said on a visit to a federal center...*” (IHT July 01, 1996)

> “*...**Indonesia’s Environment Minister** **Sarwono Kusumaatmadja** finally admitted that satellite photos show most of the fires originate on the grounds of large plantations.”* (TM October 6, 1997).

"Organizations", particularly "non-forest organizations” such as UN, WB, and IMF also appeared as speakers after media and administrations.

The country of origin of the speakers were coded and categorized into high-income, middle-income, and low-income countries according to the country classification criteria of World Bank (2004), as shown in **Table 5.6**.

Table 5.6. Country of Origin of Speakers on Forest Fire Issues in Global Media

Countries	Time Magazine		International Herald Tribune		Sum	
	N	%	n	%	N	%
High Income Country	**41**	**33.33**	**62**	**26.16**	**103**	**28.61**
Canada	9	7.32	2	0.84	11	3.06
France	0	0.00	2	0.84	2	0.56
Germany	0	0.00	1	0.42	1	0.28
Greece	1	0.81	0	0.00	1	0.28
Hongkong	0	0.00	2	0.84	2	0.56
Italy	0	0.00	6	2.53	6	1.67
Portugal	0	0.00	1	0.42	1	0.28
Singapore	0	0.00	10	4.22	10	2.78
Spain	0	0.00	1	0.42	1	0.28
United Kingdom	0	0.00	2	0.84	2	0.56
USA	31	25.20	35	14.77	66	18.33
Middle Income Country	**12**	**9.76**	**64**	**27.00**	**76**	**21.11**
Brazil	4	3.25	0	0.00	4	1.11
Indonesia	5	4.07	32	13.50	37	10.28
Malaysia	1	0.81	31	13.08	32	8.89
Philippines	1	0.81	0	0.00	1	0.28
Thailand	1	0.81	1	0.42	2	0.56
Low Income Country	0	0.00	0	0.00	0	0.00
Not Recognizable	70	56.91	111	46.84	181	50.28
TOTAL (N)	**123**	**100.00**	**237**	**100.00**	**360**	**100.00**

Note: % = n/N, n= number of speakers in the respective media, N= 123 (number of speakers in TM), 237 (number of speakers in IHT), and 360 (total number of speakers).

Half of the speakers on forest fire statements in global media were from unrecognized country of origin, while 28% came from high-income countries and 21% from middle income countries, while none came from low income countries.

Time Magazine quoted speakers from "high-income countries" more often than speakers from "middle-income countries", while the reverse occurred for International Herald Tribune. Most speakers from high-income countries

originated from USA, the country of origin of both of these global media. While the countries of origin of the “middle-income countries” speakers were often from Indonesia and Malaysia, two neighbouring countries that were often troubled by forest fire haze in Kalimantan.

5.1.1.4 Interest Positions

In the research of environmental politics, there are three interest positions, i.e. causers, victims, and helpers (von Prittwitz 1990). In this research, actors were categorized into these three interest positions. In such cases, sometimes the causers of forest fire could as well be the victim or helper, and vice versa.

5.1.1.4.1 Causers

The causers of the problem on forest fire issues in the global news media were classified into scientist and non scientist categories. Non scientiest categories were devided into seven categories: “politicians”, “administrations”, “media”, “NGOs”, “organizations”, “enterprises”, and “others”. Totally, 315 of 360 speakers in global media spoke about the causers concerning forest fire issues (**Table 5.7**).

The category of "others" was considered as the most stated causer of problem as mentioned by 144 speakers, followed by "nature" with 83 times. From 136 causers assigned by the journalist (“media”) in global media, 55 of them (40.44%) were blamed to “others” as the causer of problem. “Others” were also appointed to the “causer of problem” in the 21 of 46 statements given by “administrations”. Included under the category of "others" were: single person, "human activities" (agricultural waste burning, camp fire, or discarding cigarette butts carelessly) or anything else that could not be classified in any particular categories, such as "smoke", as found in the following quotation in a global media.

> *“As this **smoke** bound city endured another day of choking fumes Thursday, neighbouring Indonesia declared a national disaster and called on all levels of society to mobilize against the forest fires that have left several countries in the region under a thick, gray haze.” (IHT September 26, 1997).*

Table 5.7. Causers of Problem on Forest Fire Issues in Global Media

Speakers	Causers of Problem													
	Politicians		Adminis-trations		Enter-prises		Society		Others		Nature		Sum	
	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**1**	**0.33**	**1**	**3.33**	**3**	**10.00**	**0**	**0.00**	**16**	**53.33**	**9**	**30.00**	**30**	**100.00**
B. Non-Scientists	**21**	**7.37**	**17**	**5.96**	**39**	**13.68**	**6**	**2.11**	**128**	**44.91**	**74**	**25.96**	**285**	**100.00**
Politicians	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Administrations	3	0.95	1	2.17	8	17.39	1	2.17	21	45.65	12	26.09	46	100.00
Media	7	2.22	6	4.41	20	14.71	2	1.47	55	40.44	46	33.82	136	100.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	1	100.00
Organizations	5	1.59	4	9.09	4	9.09	1	2.27	25	56.82	5	11.36	44	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00	1	50.00	2	100.00
Others	5	1.59	6	10.91	7	12.73	2	3.64	25	45.45	10	18.18	55	100.00
Total	**22**	**6.98**	**18**	**5.71**	**42**	**13.33**	**6**	**1.90**	**144**	**45.71**	**83**	**26.35**	**315**	**100.00**

Note: % = n/N; where n= frequency of the respective causer, N = 315 (total number of causers)

The causer of problem under the category of "nature" included an extreme heat or prolonged dry season (long drought). **Table 5.7** appoints that 46 of 136 causers (33%) assigned by journalists (“media”) and 26% of “administrations” blamed “nature” as the causer of problem.

Other than causers of problem, causes of problems were also analyzed, comprising five categories: accidental causes, inadvertent causes, mechanical causes, Intentional causes, and others. **Accidental causes** referred to unintended consequences beyond human control, e.g. natural disasters such as drought, floods, lightning, etc. **Inadvertent causes** referred to unintended consequences of willed human actions (ignorant actions by humans; carelessness or recklessness), e.g. out of control fire due to burning of waste by local farmers. If the causes were intended consequences by intervening indirect agents guided (things are designed, programmed or trained by humans to result in certain consequences), use of machine to result is a consequence, then they would be classified as **mechanical causes**. If the causes were intended consequences by human beings in order to bring about the consequences that actually happened, whether they had negative or positive consequences, e.g. intentional burning for land preparation, which would be categorized as **intentional causes**. The category of “others” related to other causes that could

not be classified under any of the previous categories, such as out of control population growth (**Table 5.8**).

Table 5.8. Causes of Problem on Forest Issues in Global Media

Speakers	Causes of Problems											
	Accidental Causes		Inadvertent Causes		Mechanical Causes		Intentional Causes		Others		Sum	
	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**9**	**29.03**	**6**	**19.35**	**0**	**0.00**	**6**	**19.35**	**10**	**32.26**	**31**	**100.00**
B. Non Scientists	**74**	**28.91**	**43**	**16.80**	**0**	**0.00**	**43**	**16.80**	**96**	**37.50**	**256**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	1	100.00
Administrations	12	30.00	4	10.00	0	0.00	8	20.00	16	40.00	40	100.00
Media	45	35.71	24	19.05	0	0.00	24	19.05	33	26.19	126	100.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Organizations	6	15.38	5	12.82	0	0.00	5	12.82	23	58.97	39	100.00
Enterprises	1	20.00	1	20.00	0	0.00	0	0.00	3	60.00	5	100.00
Others	10	22.22	9	20.00	0	0.00	6	13.33	20	44.44	45	100.00
Total (N)	**83**	**28.92**	**49**	**17.07**	**0**	**0.00**	**49**	**17.07**	**106**	**36.93**	**287**	**100.00**

Note: % = n/N; where n= frequency of cause, N = 287 (total number of causes)

The category of "others" was the most widely mentioned causes of problems of forest fire quoted in global media, and it is related to human factors that could not be classified in any particular category. Among them “haze" or "smoke" that endangered human health and disrupt transportation, and even led to aircraft accidents which caused many victims, as shown by the following statement analyzed from a forest fire article in Time Magazine:

> *“Besides worrying about the loss of tropical forests, with their unmatched natural resources, policymakers have to be concerned about the clouds of* ***smoke*** *that have endangered public health from Singapore to Houston.”* (TM, June 22, 1998).

Similar statements were also found in International Herald Tribune which mentioned "haze" as the cause of several air and sea transportation accidents due to forest fires related problems.

> “***The haze*** *is reported to have contributed to Indonesia’s worst air disaster, on Friday, when an Airbus passenger jet belonging to the national airline, Garuda,*

*crashed while trying to land in poor visibility near Medan, on the island of Sumatra, killing all 234 passengers and crew." (*IHT, October 3, 1997).

***"The haze** has also been blamed for a recent collision between two cargo ships, resulting in the loss of 29 seamen, in the busy Strait of Malacca, the main sea lane connecting the Indian and Pacific oceans."* (IHT, October 3, 1997).

From 40 causes assigned by "administration's speakers" in global media, 16 of them indicated "others" as causes of problems. With regard to forest fire issues written in global media, none of the problems was caused by "mechanical causes", and less than 30% of the total causes analyzed were considered as "accidental causes" due to natural factors beyond human control, such as prolonged drought and extreme hot temperatures. Almost 36% causes of problem assigned by the journalists ("media") in the global media were "accidental causes".

Furthermore, some causes were included under the category of "inadvertent" that is, causes as a result of human carelessness, such as fire caused by camp fire that were not completely extinguished. Meanwhile, the rest included several forest fires highlighted by global media as a result of "intentional causes" such as fire caused by an act of conscious human being with a specific purpose, as quoted in the following news footage:

*"…hundreds of Indonesian and Malaysian companies … are **using fire as a cheap and illegal means of land-clearing**" (IHT September 25, 1997).*

5.1.1.4.2. Victims

A victim is someone or something that has been hurt or is scarred or in a danger. Based on the statements in global media, victims were classified into "administrations", "enterprises", "organizations", "society", "nature", and "others" (**Table 5.9**).

Victims of forest fires were difficult to be classified under certain categories, hence were grouped as "others". Included in this category were: a farmer (single person), forest community, tourism sector, transportation sector,

schools, business, government offices, etc. As shown by the following statement published in International Herald Tribune:

> *"… President Suharto of Indonesia stopped short of declaring a state of emergency, a move taken by Malaysian officials here last week that closed **schools, businesses and non-essential government offices**." (IHT, September 26, 1997).*

Table 5.9. Victims of Problem in Global Media

Speakers	Victims of Problem													
	Adminis-trations		Enter-prises		Organi-zations		Society		Nature		Others		Sum	
	n	%	n	%	N	%	n	%	n	%	n	%	N	%
A. Scientists	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**1**	**4.13**	**14**	**60.87**	**8**	**34.78**	**23**	**100.00**
B. Non Scientists	**2**	**0.68**	**2**	**0.68**	**2**	**0.68**	**83**	**28.04**	**95**	**32.09**	**114**	**38.51**	**296**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	2	40.00	0	0.00	3	60.00	5	100.00
Administrations	0	0.00	0	0.00	0	0.00	10	27.78	9	25.00	17	47.22	36	100.00
Media	2	1.18	2	1.18	2	1.18	47	27.81	59	34.91	59	34.91	169	100.00
NGOs	0	0.00	0	0.00	0	0.00	2	28.57	4	57.14	1	14.29	7	100.00
Organizations	0	0.00	0	0.00	0	0.00	13	41.94	9	29.03	9	29.03	31	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00	2	100.00
Others	0	0.00	0	0.00	0	0.00	9	19.57	14	30.43	23	50.00	46	100.00
Total (N)	**2**	**0.63**	**2**	**0.63**	**2**	**0.63**	**84**	**26.33**	**109**	**34.17**	**122**	**38.24**	**319**	**100.00**

Note: % = n/N; where n= frequency of victim, N = 319 (total number of victims)

Beside others, speakers generally placed "nature" as a victim of forest fire. From 169 statements about victims assigned by journalists ("media"), 59 of them appointed that "nature" is the victims of problems. Beside "nature", totally more than 26% of speakers pointed out "society" as the victims. Very few speakers spoke of "administrations", "enterprises", or "organizations" as the victims of forest fires.

5.1.1.4.3 Helpers

A helper is defined as someone or something that could help solve the problems or already helped. From the analysis of the existing statements in global media, helpers could be grouped into nine categories: scientists,

politicians, administrations, enterprises, NGOs, organizations, society, nature, and others (**Table 5.10**).

Most of the helpers of the problem in global media were considered as "others" that could not be classified in any particular category. From 23 helpers assigned by “administrations”, 8 of them indicated “others” as the helper of problems. Included as "others" were single person (e.g. forest ranger) or activity (such as: "coordination") as reported by International Herald Tribune in the following news footage:

> *“…Environment Minister Sarwono Kusumaatmadja said that **coordination** was improving among various ministries to deal with the situation …” (IHT September 26, 1997).*

"Politicians", "administrations", and "organizations" were also increasingly stated as helpers in many global media statements. From 89 statements about helpers assigned by the journalist (“media”), 22 of them appointed “politicians” as the helper of problem. In this case, "politicians" who were viewed as overall helpers included “politician government “such as president, governors or regency head. They were practically positioned as "helpers of problems" in global media, for example, the instruction of President in overcoming the problems resulting from the 1997 forest fires in Indonesia.

> *“In the latest move to atone for the harm, **President Suharto of Indonesia** said Sunday that “the thick smoke not only hurts our own community but also people from neighbouring countries and added, for that, once again, Indonesia deeply apologizes ...”. In an address Sunday to the country’s armed forces in Jakarta, Mr. Suharto issued instructions to all levels of the military to increase their efforts to fight what he called “this fire disaster” occurring in exceptionally dry conditions (IHT October 6, 1997).*

Table 5.10. Helpers of Problem on Forest Fire Issues in Global Media

Speakers	Helpers of Problem																			
	Scientists		Politicians		Administration		Enterprises		NGOs		Organizations		Society		Nature		Others		Sum	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**0**	**0.00**	**0**	**0.00**	**1**	**16.67**	**0**	**0.00**	**0**	**0.00**	**1**	**16.67**	**2**	**33.33**	**0**	**0.00**	**2**	**33.33**	**6**	**100.00**
B. Non Scientists	**2**	**1.36**	**39**	**26.53**	**23**	**15.65**	**1**	**0.68**	**2**	**1.36**	**17**	**11.56**	**8**	**5.44**	**6**	**4.08**	**49**	**33.33**	**147**	**100.00**
Politicians	0	0.00	2	66.67	1	33.33	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	3	100.00
Administrations	0	0.00	7	30.43	5	21.74	0	0.00	0	0.00	1	4.35	0	0.00	2	8.70	8	34.78	23	100.00
Media	2	2.44	22	26.83	13	15.85	0	0.00	2	2.44	11	13.41	2	2.44	3	3.66	27	32.93	82	100.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00	2	100.00
Organizations	0	0.00	5	25.00	3	15.00	1	5.00	0	0.00	4	20.00	3	15.00	0	0.00	4	20.00	20	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Others	0	0.00	3	17.65	1	5.88	0	0.00	0	0.00	1.00	5.88	3	17.65	1	5.88	8	47.06	17	100.00
Total	**2**	**1.31**	**39**	**25.49**	**24**	**15.69**	**1**	**0.65**	**2**	**1.31**	**18**	**11.76**	**10**	**6.54**	**6**	**3.92**	**51**	**33.33**	**153**	**100.00**

Note: % = n/N; where n= numbers of helper, N = 153 (total number of helpers)

5.1.1.5 Solutions of Problem

There are three categories of solution of the problem: economy, social, and ecology. The economic solutions were related to the solution of problems that relied in taking measures from an economic point of view. If the solution of problems relied in taking social actions, then it would be classified as social solutions. While a solution of problem would be classified as the ecological solution, if such solution relied in taking ecological solutions (**Table 5.11**).

Table 5.11. Solutions of Problem on Forest Fire Issues in Global Media

Speakers	Solutions of Problems							
	Economical		Social		Ecological		Sum	
	n	%	N	%	n	%	n	%
A. Scientists	**2**	**16.67**	**2**	**16.67**	**8**	**66.67**	**12**	**100.00**
B. Non Scientists	**24**	**13.71**	**63**	**36.00**	**88**	**50.29**	**175**	**100.00**
Politicians	0	0.00	1	25.00	3	75.00	4	100.00
Administrations	0	0.00	13	44.83	16	55.17	29	100.00
Media	15	15.46	36	37.11	46	47.47	97	100.00
NGOs	1	33.33	1	33.33	1	33.33	3	100.00
Organizations	5	19.23	8	30.77	13	50.00	26	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	100.00
Others	3	18.75	4	25.00	9	56.25	16	100.00
Total (N)	**26**	**16.99**	**65**	**42.48**	**96**	**62.75**	**187**	**100.00**

Note: % = n/N; where n= number of solution, N = 187 (total number of solutions)

Most of the speakers in global media stated that "ecological" was the solution of problem of forest fire, such as planting certain tree species that could serve as firebreaks, considering the wind direction at the time of extinguishing the fire, as well as considering the time of the arrival of rainy season. To avoid the occurrence of forest fires or to prevent the expansion of the burning areas, controlled fire activity was conducted by traditional community groups to open new fields, often carefully considered the timing of the arrival of rainy season.

"Social solution" was the second most mentioned solution of problems in many statements on forest fire issues in global media. From 29 statements about solutions assigned by “administrations”, 13 of them proposed “social solution” for solving the problem of forest fire. The "economical solutions" ranked the last

as the solution of problems, referred by about 15% of speakers in the global media. “Solution of problem” only considered general matters, how the speaker expressed the solution to the problem or spoke in general terms according to categories of economy, social or ecology in solving the problems. If the speakers referred to concrete instruments to be implemented in the solving of the problem, then the statements were also analyzed by instruments of solution of problems. These instruments were classified into six categories; namely: economical instruments, informational instrument, procedural instruments, regulative instruments, praxis and others. The **economical instruments** referred to all political interventions that through exchange of finances could influence the actions of actors, either negative or positive, e.g. taxes or subsidies. **The informational instruments** referred to political influences exerted through providing information, clarifications or public work, e.g. early warning system, extensions, public relation, etc. **The procedural instruments** involved socio-political programs or a dialogue-process between various interests groups to solve region-oriented problems through round tables, public hearings, public debates, symposia, etc. This instrument focused on a communication process. **The regulative instruments** would be checked if there were political regulations by obligatory (legal) rules, e.g. sanctions and laws. **The planning instruments** were defined as political means aiming at solving spatial related problems by representation and organization (plan), e.g. National Forest Program. The instrument was classified as **praxis** if political influence was achieved through the exchange of provisions of services and donations or practical activities, e.g. founding an association, planting trees, and other practical actions. Finally, the instrument would be considered as **others**, if the instruments could not be classified in any of the previous categories (**Table 5.12**).

Table 5.12. Instruments of Solution of Problem on Forest Fire Issues in Global Media

Speakers	Instrument's Solution of Problem													
	Economical		Informa-tional		Procedu-ral		Regulative		Praxis		Others		Sum	
	n	%	n	%	N	%	n	%	n	%	n	%	N	%
A. Scientists	**2**	**13.33**	**2**	**13.33**	**1**	**6.67**	**1**	**6.67**	**7**	**46.67**	**2**	**13.33**	**15**	**100.00**
B. Non Scientists	**22**	**11.00**	**3**	**1.50**	**13**	**6.50**	**21**	**10.50**	**86**	**43.00**	**55**	**27.50**	**200**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	2	66.67	1	33.33	3	100.00
Administrations	3	7.89	0	0.00	3	7.89	7	18.42	16	42.11	9	23.68	38	100.00
Media	14	13.33	2	1.90	9	8.57	7	6.67	43	40.95	30	28.57	105	100.00
NGOs	1	25.00	0	0.00	0	0.00	1	25.00	1	25.00	1	25.00	4	100.00
Organizations	3	9.38	1	3.13	1	3.13	5	15.63	15	46.88	7	21.88	32	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Others	1	5.56	0	0.00	0	0.00	1	5.56	9	50.00	7	38.89	18	100.00
Total (N)	**24**	**11.16**	**5**	**2.33**	**14**	**6.51**	**22**	**10.23**	**93**	**43.26**	**57**	**26.51**	**215**	**100.00**

Note: % = n/N; where n= number of instrument of solution, N = 215 (total number of instruments of solution)

Global media referred to "praxis" as the most potential instruments used for solution in connection to forest fire. There were 43 of 105 statements about instruments of solutions on forest fire issues spoken by journalists ("media") suggested "praxis" as instruments of solution of problem. For instance, mobilizing fire fighters, providing water shooters, making fire-belt by planting fire-resistant trees, using water bombs to extinguish fire, or making artificial rains as stated by the International Herald Tribune as followed:

> *"... the Indonesian government ...* ***had deployed 8,437 fire fighters*** *throughout the country. They are joined by more than 1,000 Malaysian fire fighters, who were sent to Sumatera, the centre of forest fires. Indonesian officials had also announced that Japan had offered to contribute* ***300 high-powered water shooters to help extinguish the fires*** *and that France had offered to send advisers"* (IHT September 26, 1997).

In addition to "praxis", the instruments for solution of problems that were practically written in global media statements were "others", "economical instruments" and "regulative instrument". Included under "others" were a variety of instruments, including changing the attitudes of society so they were

no longer applied burning activities in land clearing and land preparation for gardens or fields. Meanwhile, the "economical instruments" of solution of problems on forest fire were also mentioned by the speakers in global media during the great fire of 1997 that hit Indonesia, among which were written in the International Herald Tribune as follows:

> *"To overcome fire in 1997, the Indonesian government announced that it had **allocated 3.1 billion rupiahs (US$1 million)** to the cause and ... to help extinguish the fires..."* (IHT September 26, 1997).

"Regulative instruments" were mentioned quite often in global media, among others, developing new policies and regulations to support fire suppression, fire prevention management and law enforcement. Although the number was not great, some statements in the global media also mentioned "procedural instruments" as one of the solutions of problems, such as the following statement published in International Herald Tribune:

> *"The president has **instructed officials** in the central government and the regions to mobilize to overcome the disaster…" (IHT, September 26, 1997).*

5.1.1.6 Risk Evaluation

Forest fires are recurrent disasters that often resulted in substantial losses and high risk of environmental degradation which threatened the life survival on earth. Therefore, this study evaluated the media concerning future risk of forest fires. Risk denoted future event, or a situation or an event where there is uncertain probability of harmful occurrence. Speaking actor could use the word "risk, endanger or can/could, may, might, maybe", etc., in their statements in the articles. In this case, it was necessary to identify the words used by the speakers related to the probability of risk occurrence, loss of natural resources, loss of human lives, and loss of man-made material. "Risk evaluation" also tracts political relevance from such risk, keeping in mind that forest fire issues were often trans-national boundary, where the impacts were felt by countries beyond the location of forest fire event (**Table 5.13**).

In “risk evaluation” of forest fire issues, global media were mostly concerned with the “probability of risk occurrence” rather than other risks, such as “loss of natural resources”, “human lives”, “man-made materials”, or “political relevance”. From 58 statements about risk evaluation given by journalists (“media”), 22 of them indicated “risk occurrence probability” of forest fire as their major concern. The International Herald Tribune for instance, reported on the concerns of ASEAN's Environment Ministers of the recurrence of forest fires during the next dry seasons.

> *“For the environment ministers from ASEAN, the Association of South East Asian Nations, the issue is how to prevent* ***a repeat of disastrous forest fire in Indonesia over the next few months of the annual dry season****.”* (IHT, April 4, 2000).

Table 5.13. Risk Evaluation of Forest Fire Issues in Global Media

Speakers	Risk Evaluations											
	Risk Occurrence Probability		Loss of Natural Resources		Loss of Human Lives		Loss of man-made material		Political Relevance		Sum	
	n	%	n	%	n	%	N	%	n	%	N	%
A. Scientists	**1**	**14.29**	**3**	**42.86**	**0**	**0.00**	**0**	**0.00**	**3**	**42.86**	**7**	**100.00**
B. Non Scientists	**53**	**51.46**	**15**	**14.56**	**5**	**4.85**	**4**	**3.88**	**26**	**25.24**	**103**	**100.00**
Politicians	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Administrations	8	61.54	0	0.00	0	0.00	0	0.00	5	38.46	13	100.00
Media	22	37.93	12	20.69	5	8.62	2	3.42	17	29.31	58	100.00
NGOs	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Organizations	7	63.64	0	0.00	0	0.00	0	0.00	4	36.36	11	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Others	14	73.68	3	15.79	0	0.00	2	10.53	0	0.00	19	100.00
Total (N)	**54**	**49.09**	**18**	**16.36**	**5**	**4.55**	**4**	**3.64**	**29**	**26.36**	**110**	**100.00**

Note: % = n/N; where n= frequency of a respective risk evaluation, N = 29 (total number of Risk Evaluations)

In addition to probability of risk occurrence, "political relevance" of forest fire issue also received considerable global attention in the media. Forest fire was considered to have political relevance through future risk of relations between neighbouring countries. In 2002, for example, when forest fires and thick haze struck the ASEAN region again, one solution to solve the problems was through

political discussion between the Prime Minister of Malaysia and President of the Republic of Indonesia:

> *"In August 2002, the **Deputy Prime Minister Abdullah Ahmad Badawi was expected to discuss the issue of cross-border pollution with Indonesian President Megawati Sukarnoputri** when they met on the sidelines of the World Summit on Sustainable Development in Johannesburg." (IHT, August 30, 2002).*

5.1.1.7 Frames

Frames examined the tendency of one main position of each issue in the media. The most important frames of forest fire discourse in media discussed in this section. In this study, frames were adopted from Semetko and Valkenburg (2000). Following their approach, frames were applied by selecting some aspects of particular problem's definition (economy vs. environment), causal interpretation (human causes vs. natural causes), moral (impact) evaluation (forest fire responsible for global climate change vs. not responsible) and treatment (policy) recommendation (national regulations vs. international convention) as described in **Table 5.14**.

Table 5.14. Frames of Forest Fire Issues in Global Media

Speakers	Problem's definition				Causal interpretation				Impact evaluation				Policy recommendation				Sum	
	Economy		Environment		Human Causes		Natural Causes		FF are responsible for GCC		FF are not responsible for GCC		International Conventions		National Regulation			
	n	%	n	%	n	%	n	%	N	%	n	%	n	%	n	%	N	%
A. Scientists	**1**	**5.88**	**1**	**5.88**	**8**	**47.06**	**4**	**25.53**	**2**	**11.76**	**0**	**0.00**	**0**	**0.00**	**1**	**5.88**	**17**	**100.00**
B. Non Scientists	**11**	**7.19**	**24**	**15.69**	**58**	**37.91**	**40**	**26.14**	**7**	**4.58**	**1**	**0.65**	**2**	**1.31**	**10**	**6.54**	**153**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Administrations	1	5.00	2	10.00	10	50.00	6	30.00	0	0.00	0	0.00	1	5.00	0	0.00	20	100.00
Media	5	5.88	16	18.82	30	35.29	25	29.41	4	4.71	1	1.18	1	1.18	3	3.53	85	100.00
NGOs	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00	2	100.00
Organizations	3	13.64	2	9.09	8	36.36	2	9.09	3	13.64	0	0.00	0	0.00	4	18.18	22	100.00
Enterprises	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Others	2	8.70	3	13.04	10	43.48	6	26.09	0	0.00	0	0.00	0	0.00	2	8.70	23	100.00
Total (N)	**12**	**7.06**	**25**	**14.71**	**66**	**38.82**	**44**	**25.88**	**9**	**5.29**	**1**	**0.59**	**2**	**1.18**	**11**	**6.47**	**170**	**100.00**

Note: % = n/N; where n= frequency of a respective frames, N = total number of Frames

According to the “problem’s definition”, frames of global media on forest fires were mostly dominated by environmental problems rather than economic ones. This signified that in the perspectives of global media, reviews of environmental aspects of forest fires were considered more significant than the economic aspects.

Meanwhile, based on "causal interpretation", it was clear that speakers in global media tend to view forest fire incidents as being caused by human activities rather than due to natural factors. It was stated by 30 of 85 journalists spoken in global media. Some human activities were characterized by the speakers in global media as associated with causes of forest fires such as: shifting cultivation, forest encroachment, conflict over forestlands, camp fire, and some other human activities.

The “impact evaluation” mainly discussed whether forest fire was responsible for the global climate change. In general, speakers in global media assumed that forest fire occurrences were responsible for global climate change. In providing "policy recommendation" to prevent and combat forest fires, speakers in global media often stressed the importance of national regulations over international convention.

5.1.2 National Media Discourse on Forest Fire

Articles on forest fire in national media were analyzed from two Indonesian media, i.e. Kompas and Republika. Both of these media were the most prominent newspaper in Indonesia with many readers and coverage of the national territory (Subiakto 2000; Nuryadi 2003; Mahaka Media 2009).

5.1.2.1 Distribution of Articles and Statements

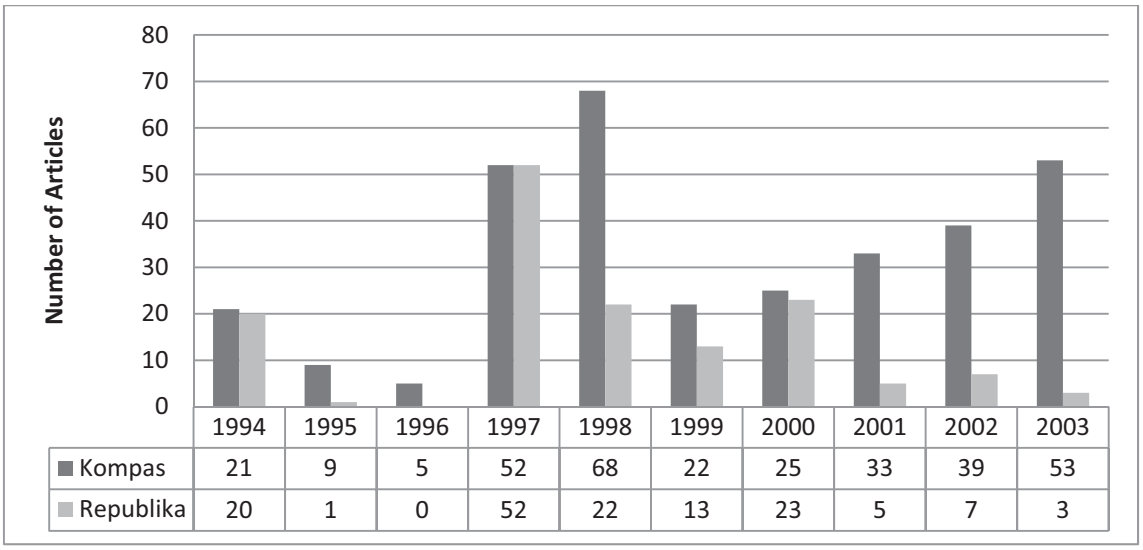
The numbers of forest fire articles in national media were higher than that in global media, which were about 473 articles and 1,447 statements. Kompas contained two times more articles on forest fire than Republika and three times as many statements related to forest fire than Republika (**Table 5.15**).

Table 5.15. Number of Articles and Statements on Forest Fire in National Media

Sources	Articles		Statements	
	n	%	n	%
Kompas	327	69.13	1,036	71.60
Republika	146	30.87	411	28.40
Total (N)	**473**	**100.00**	**1,447**	**100.00**

Note: % = n/N, n= number of article in the respective media, N= 473 (total number of articles) and 1,447 (total number of statements)

Similar to global media, the national media also covered many forest fire articles in 1997 and 1998, then declined in 1999 and rose rapidly in 2000 through to 2003 (**Figure 5.3**).



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Kompas	21	9	5	52	68	22	25	33	39	53
Republika	20	1	0	52	22	13	23	5	7	3

Figure 5.3. Number of Forest Fire Articles in National Media in 1994-2003

As explained in global media, during the periods of 1997-1998, large forest fires occurred in Kalimantan (Borneo), Indonesia, which were fatal and resulted in many losses in the location of event, even to the neighbouring Southeast Asian countries. The Indonesian President at the time, Suharto, apologized to neighbouring countries being affected by the haze from the fires and declared it as a national disaster as shown in the following excerpts:

> *"President Suharto, on behalf of the Indonesian nation, **apologizing to the people of neighbouring countries** disrupted by the smoke caused by forest fires that occured in Indonesia" (Republika, September 26, 1997).*

> *"The government finally declared the lately burning forest and land, with all its consequences, as a disaster, ... disaster that **has been endangering the public health and causes economic loss** "(Republika, September 16, 1997).*

As a national media, it was very likely that most of the locations of event of forest fire issues exposed in the articles were in Indonesia. However, although it contained mostly domestic news, the national media also reported forest fires occurring in other countries (**Figure 5.4**).

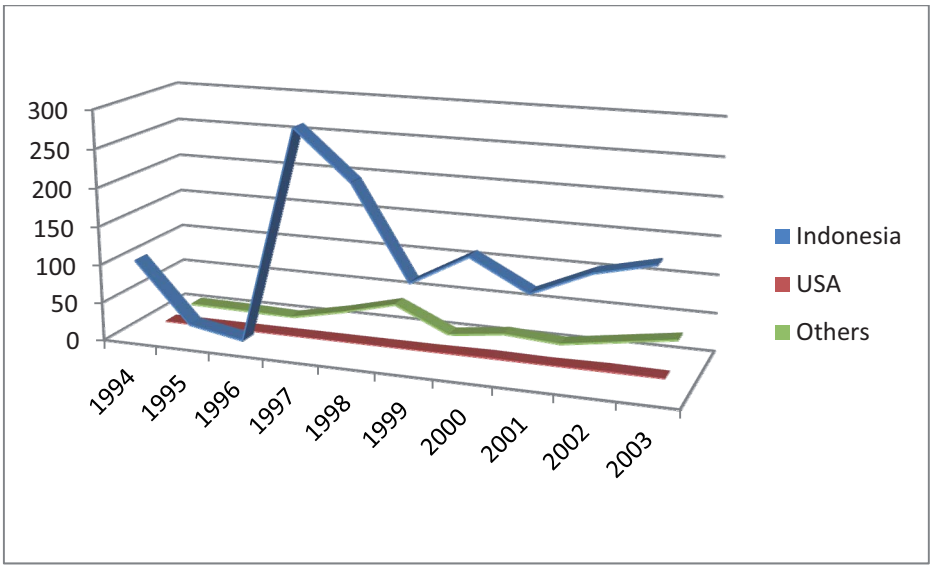


Figure 5.4. Locations of Events of Forest Fire Issues in National Media

5.1.2.2 Events

Each forest fire event in an article in national media, i.e. Kompas and Republika could be classified according to its type and valence (**Table 5.16**). Articles on forest fire issues written in Kompas were largely considered as "genuine event" since the reported news was an event that actually occurred and was in progress during the reportation (genuine), for example, news on an article entitled "Bung Hatta Grand Forest Park was Burnt" (Kompas, June 3, 2003). Other articles included in the category of "genuine event" was "Forest Fire Rage in Canberra" (Kompas, January 20, 2003).

In contrast to Kompas, Republika had more reports on forest fire issues from "medialized event", which hold some sorts of media interests, such as press conferences or reports of conferences. One example of such article entitled "The Australian Government was Considered Slow in Handling Forest Fire" was the news report released, based on representation of Antara News Agency in Canberra (Republika, January 5, 2002).

Table 5.16. Types and Valence of Event in National Media

	Source				Total	
	Kompas		Republika			
	n	%	n	%	N	%
A. Types of event (N)	**327**	**100.00**	**146**	**100.00**	**473**	**100.00**
Genuine	164	50.15	60	41.10	224	47.36
Medialized	162	49.54	85	58.22	247	52.22
Produced	1	0.31	1	0.68	2	0.42
B. Valences of event (N)	**327**	**100.00**	**146**	**100.00**	**473**	**100.00**
Positive	7	2.14	3	2.05	10	2.11
Negative	38	11.62	12	8.22	50	10.57
Ambivalent	281	85.93	131	89.73	412	87.10
Not Recognizable	1	0.31	0	0.00	1	0.21

Note: % = n/N, n= number of article in the respective media, n= 327 (number of articles in Kompas), 146 (number of article in Republika), and N=473 (total number of articles)

Unlike the global media which generally considered forest fire with negative valence, articles in national media, i.e. Kompas and Republika showed more "ambivalent" valence on forest fires. Forest fire articles in national media extensively covered the positive sides in addition to negative sides such as losses due to forest fires and the negative impact result; hence, valence of event in such article had unclear side, therefore, coded as ambivalent.

The positive sides written by national media were largely concerned with government efforts in disaster mitigation and prevention of forest fire that had been successful and recommended or suspected to overcome the problems of forest fire. Furthermore, the reports also included compliments or positive responses from the UN envoy such as in an article entitled “The UN Envoy Praised the Efforts to Combat Forest Fires”, as scripted below:

> *"Disaster Management Commission representative from the United Nations (UN) Richard van Hazebrovek (expert on forest and land fire management) and Timo Heikkela (expert on peat land fires)* ***praised the efforts to combat forest and land fire carried out by the District Government of Ketapang,***

***West Kalimantan**, who succeeded despite limited facilities available ..." (Kompas, October 9, 1997).*

However, the article also mentioned the thicken haze that was over the standard threshold value, as well as the extent of the burnt forest area that could not yet be extinguished.

Table 5.17 presented the "scope of the event" of forest fire issues in the national media.

Table 5.17. Scope of Event of Forest Fire Issues in National Media

Scopes of Event	Sources				Sum	
	Kompas		Republika			
	n	%	n	%	n	%
Global	6	1.83	3	2.05	9	1.90
Regional	10	3.06	9	6.16	19	4.02
National	173	52.91	91	62.33	264	55.81
Local	138	42.20	43	29.45	181	38.27
Not recognizable	0	0.00	0	0.00	0	0.00
Total (N)	**327**	**100.00**	**146**	**100.00**	**473**	**100.00**

Note: % = n/N, n= number of article in the respective media, n= 327 (number of articles in Kompas), 146 (number of article in Republika), and N=473 (total number of articles)

Most of the coverage on the scope of event of forest fires reported in Kompas and Republika were mostly national, followed by local, regional (Southeast Asia) and global. This was consistent with the existence of Kompas and Republika as the leading national newspapers in Indonesia.

Based on countries of event, news of forest fires reported in Kompas and Republika could be classified into high-income countries, middle income countries, low-income countries, and not recognizable (**Table 5.18**). Most of the locations of forest fires written in Kompas and Republika took place in the middle income countries, especially in Indonesia. Although Kompas and Republika are national media, they also raised news about the locations of forest fire events outside Indonesia, including forest fires that occurred in high-income countries, such as Australia, USA, Portugal and Switzerland. One of the

articles in national media, for example, raised the news of forest fire in Australia which engulfed hundreds of homes (Republika, January 20, 2003).

Table 5.18. Countries of Events of Forest Fire Issues in National Media

Countries	Source				Sum	
	Kompas		Republika			
	n	%	n	%	n	%
High Income	**5**	**1.53**	**3**	**2.05**	**8**	**1.69**
Australia	1	0.31	3	2.05	4	0.85
USA	2	0.61	0	0.00	2	0.42
Portugal	1	0.31	0	0.00	1	0.21
Switzerland	1	0.31	0	0.00	1	0.21
Middle Income	**308**	**94.19**	**134**	**91.78**	**442**	**93.45**
Brazil	2	0.61	0	0.00	2	0.42
Indonesia	302	92.35	134	91.78	436	92.18
Mexico	3	0.92	0	0.00	3	0.63
Russian	1	0.31	0	0.00	1	0.21
Low Income	0	0.00	0	0.00	0	0.00
Not recognizable	14	4.28	9	6.16	23	4.86
Total (N)	**327**	**100.00**	**146**	**100.00**	**473**	**100.00**

Note: % = n/N, n= number of articles in the respective media, N= 327 (number of articles in Kompas), 146 (number of articles in Republika), and 473 (total number of articles)

5.1.2.3 Speakers

As in the global media, speakers of forest fires in Kompas and Republika could be classified into the categories of scientists (forest science, non-forest science, and not recognizable) and non-scientists, i.e. politicians, administrations, media, NGOs, organizations, enterprises, research and others (**Table 5.19**).

Kompas and Republika are public media; therefore most speakers were non-scientists. In several occasions, Kompas brought up special coverage about the environment, resulting in a higher number and proportion of scientists who spoke about forest fire issues than in Republika. Slightly different from the global media which covered more statements from non-forest scientists, most

scientists who spoke on forest fire in Kompas and Republika were forest scientists. This was because in general, the resource persons who had competence on the problem of forest fires were scientists who teach at the Faculty of Forestry at several leading universities in Indonesia.

Table 5.19. Distribution of Speakers in National Media

Speakers	Kompas		Republika		Sum	
	n	%	n	%	n	%
A. Scientists	**28**	**2.70**	**8**	**1.95**	**36**	**2.49**
a. Forest science	15	1.45	5	1.22	20	1.38
b. Non forest science	13	1.25	2	0.49	15	1.04
c. Not Recognizable	0	0.00	1	0.24	1	0.07
B. Non Scientists	**1,008**	**97.30**	**403**	**98.05**	**1,411**	**97.51**
Politicians	**10**	**0.97**	**7**	**1.70**	**17**	**1.17**
a. Politicians government	7	0.68	6	1.46	13	0.90
b. Politicians non government	3	0.29	1	0.24	4	0.28
Administrations	**399**	**38.51**	**128**	**31.14**	**527**	**36.42**
a. Forest administration	138	13.32	46	11.19	184	12.72
b. Non forest administration	261	25.19	82	19.95	343	23.70
Media	**311**	**30.02**	**135**	**32.85**	**446**	**30.82**
NGOs	**51**	**4.92**	**19**	**4.62**	**70**	**4.84**
a. Forest NGO	7	0.68	1	0.24	8	0.55
b. Non Forest NGO	44	4.25	18	4.38	62	4.28
Organizations	**55**	**5.31**	**12**	**2.92**	**67**	**4.63**
a. Forest organization	15	1.45	3	0.73	18	1.24
b. Non forest organization	40	3.86	9	2.19	49	3.39
Enterprises	**28**	**2.70**	**12**	**2.92**	**40**	**2.76**
a. Forest enterprises	22	2.12	10	2.43	32	2.21
b. Non forest enterprises	6	0.58	2	0.49	8	0.55
Others	154	14.86	90	21.90	244	16.86
Total (N)	**1,036**	**100.00**	**411**	**100.00**	**1,447**	**100.00**

Note: % = n/N, n= number of speakers in the respective media, N= 1,036 (number of speakers in Kompas), 411 (number of speakers in Republika), and 1,447 (total number of speakers)

From the non-scientists category, speakers among the administrations were quite dominant in the forest fire discourse in national media. However, unlike scientists, the dominant speakers in national media were the non-forest administrations. This was because forest fires were considered not only a problem related to forest management under the responsibility of forest administration, but also closely related to the causes or effects of forest fires which were under the authority of non-forest administration, such as Bappeda (Regional Development Planning Board, Plantation Office, Fire Department or other agencies).

Based on the country of origin, speakers of forest fire discourse in Kompas and Republika were not only from Indonesia but also from high-income and middle-income countries (**Table 5.20**).

Table 5.20. Country of Origin of Speakers in National Media

Countries	Kompas		Republika		Sum	
	n	%	n	%	n	%
High Income Countries	**11**	**1.06**	**15**	**3.65**	**26**	**1.80**
Australia	3	0.29	9	2.19	12	0.83
Canada	0	0.00	1	0.24	1	0.07
France	1	0.10	0	0.00	1	0.07
Germany	1	0.10	1	0.24	2	0.14
Japan	0	0.00	2	0.49	2	0.14
Singapore	4	0.39	2	0.49	6	0.41
USA	2	0.19	0	0.00	2	0.14
Middle Income Countries	**643**	**62.07**	**231**	**56.20**	**874**	**60.40**
Brazil	3	0.29	0	0.00	3	0.21
Indonesia	616	59.46	221	53.77	837	57.84
Malaysia	17	1.64	7	1.70	24	1.66
Mexico	4	0.39	0	0.00	4	0.28
Philippines	1	0.10	3	0.73	4	0.28
Thailand	2	0.19	0	0.00	2	0.14
Low Income Countries	0	0.00	0	0.00	0	0.00
Not recognizable	382	36.87	165	40.15	547	37.80
Total (N)	**1,036**	**100.00**	**411**	**100.00**	**1,447**	**100.00**

Note: % = n/N, n= number of speakers in the respective media, N= 1,036 (number of speakers in Kompas), 441 (number of speakers in Republika), and 1,447 (total number of speakers)

Most speakers in Kompas and Republika originated from middle-income countries, especially Indonesia. Beside Indonesia, speakers of other middle-income countries include Malaysia, Brazil, Mexico, Philippines and Thailand. Speakers from high-income countries in Kompas and Republika came from Australia, Canada, France, Germany, Japan, Singapore, and USA. These were concluded from the news about forest fires in Australia in 2002, for instance, the Republika newspaper (January 5, 2002) referred to the opinion of several experts in Australia such as the environmental expert from the Institute for Scientific and Industrial Research of Australia (CSIRO), Professor Phil Cheney and Head of Australian Institute of Fire Research and Development Agency, Len Foster. Meanwhile, speakers of unrecognized country of origin formed quite a large number, as in the following article excerpt:

> *"**According to Miranda (name of speaker),** while the fire raged in Sydney continues, public anger is directed towards the perpetrators with unclear identities who were arrested simply because they bring matches in the bush." (Republika, January 5, 2002).*

5.1.2.4 Interest Positions

Interest positions in forest fire discourse in national media (Kompas and Republika) were classified into three categories: causers, victims, and helpers.

5.1.2.4.1 Causers of Problems

Like the global media, speakers in national media also specified “NGOs” and “organizations” as causers apart from the six categories mentioned in global media, although comprised of only a small frequency. All speakers in each category spoke of causer, but unlike the ones from the global media, "administration speakers" dominated over "media" followed by "others". The rest of the speakers’ categories spoke less on the causers. In total, there were 1,186 causers mentioned by 1,447 speakers in national media, meaning that not all speakers discussed about the causers (**Table 5.21**).

The category of "other causers" comprised more than half of the statements related to causer of forest fire, and was the most frequently appeared category. Single person, community, experts, and other human activities that could not be included into the earlier mentioned categories, such as illegal logging, camp fire, etc were included in this category. Moreover, smog was also the causer of problem that was often mentioned by the speakers. “Administration” and “media” often blamed others, e.g. smog, as causer of forest fire related problems. Similar with global media, national media also reported that forest fire’s smog in Indonesia had adversely affected the health, economic sectors such as agriculture, tourism, transportation, etc., of the people of Indonesia as well as the neighbouring countries. This would be further explained during the explanation of the victims of problems. The following excerpt was taken from a national media which contained causer of problem categorized as "others”:

> *"**The fog** accompanied by increasingly dense haze covering the city of Pontianak and the surrounding area, ... all types of aircraft have stop their flights to Supadio airport, ... Bouroq slip on the runway during landing, ... Pontianak is almost no longer visible from the air." (Kompas, December 26, 1994).*

Apart from the category of “others”, enterprises were actors who were often blamed as the causer of the problem of forest fire stated in national media. From 488 causers of problem assigned by “administration”, 215 of them were “enterprises”. Totally, more than 37% of the causers of forest fire problem stated by all speakers in Kompas and Republika were "enterprises". All of speakers, particularly administrations, blamed enterprises, who practiced burning for land preparation, as the causer of problems concerning forest fire.

Table 5.21. Causers of Problem on Forest Fire Issues in National Media

Speakers	Causers of Forest Fire																	
	Human														Nature		Sum	
	Politicians		Administrations		NGOs		Organizations		Enterprises		Society		Others					
	n	%	n	%	n	%	n	%	n	%	n	%	N	%	n	%	N	%
A. Scientists	**0**	**0.00**	**3**	**7.69**	**0**	**0.00**	**0**	**0.00**	**14**	**35.90**	**0**	**0.00**	**14**	**35.90**	**8**	**20.51**	**39**	**100.00**
B. Non Scientists	**4**	**0.35**	**20**	**1.74**	**1**	**0.09**	**4**	**0.35**	**434**	**37.84**	**9**	**0.78**	**615**	**53.62**	**60**	**5.23**	**1147**	**100.00**
Politicians	0	0.00	1	7.69	0	0.00	0	0.00	3	28.03	1	7.69	7	53.85	1	7.69	13	100.00
Administrations	0	0.00	3	0.61	0	0.00	2	0.41	215	44.06	5	1.02	236	48.36	27	5.53	488	100.00
Media	1	0.36	7	2.51	1	0.36	1	0.36	84	30.11	3	1.08	169	60.57	13	4.66	279	100.00
NGOs	0	0.00	3	2.97	0	0.00	1	0.99	53	52.48	0	0.00	41	40.59	3	2.97	101	100.00
Organizations	3	5.17	0	0.00	0	0.00	0	0.00	14	24.14	0	0.00	36	62.07	5	8.62	58	100.00
Enterprises	0	0.00	1	2.78	0	0.00	0	0.00	3	8.33	0	0.00	28	77.78	4	11.11	36	100.00
Others	0	0.00	5	2.91	0	0.00	0	0.00	62	36.05	0	0.00	98	56.98	7	4.07	172	100.00
Total	**4**	**0.34**	**23**	**1.94**	**1**	**0.08**	**4**	**0.34**	**448**	**37.77**	**9**	**0.76**	**629**	**53.04**	**68**	**5.73**	**1,186**	**100.00**

Note: % = n/N; where n= number of causer, N = total number of causers

Other causers of problems due to "human factors" were also mentioned in the national media, although their numbers were very small compared to the categories of "others" and "enterprises". Similarly, "causer of problems" originated from "nature" was also very small in number, only about 5% of the total "causers of the problem" that were published in national media, far smaller than that reported in global media. Similar to the analysis in global media, "causes of problems" were also analyzed, in which causes were classified into “accidental causes”, “inadvertent causes”, “mechanical causes”, “intentional causes”, and “others” (**Table 5.22**).

More than half of the causes of forest fire problems were referred to in national media as "intentional causes", meaning that speakers in national media referred to intentional human activities as causes of majority of forest fires events, including: land burning activity for plantation development, shifting cultivation, or forest encroachment as shown by the following excerpt:

> *"... **the forest fire was done intentionally by someone** who intends to go back into the wildlife reserve forest ... " (Kompas, September 11, 2003).*

Table 5.22. Causes of Problem on Forest Fire Issues in National Media

Speakers	Causes of Problem											
	Accidental Causes		Inadvertent Causes		Mechanical Causes		Intentional Causes		Others		Sum	
	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**9**	**20.00**	**12**	**26.67**	**1**	**2.22**	**19**	**42.22**	**4**	**8.89**	**45**	**100.00**
B. Non Scientists	**172**	**20.80**	**203**	**24.55**	**2**	**0.24**	**419**	**50.67**	**31**	**3.75**	**827**	**100.00**
Politicians	0	0..00	3	33.33	0	0.00	6	66.67	0	0.00	9	100.00
Administrations	64	18..99	74	21.96	0	0.00	189	56.08	10	2.97	337	100.00
Media	48	22.43	61	28.50	2	0.93	96	44.86	7	3.27	214	100.00
NGOs	5	8.20	12	19.67	0	0.00	40	65.57	4	6.56	61	100.00
Organizations	13	28.89	13	28.89	0	0.00	12	26.67	7	15.56	45	100.00
Enterprises	11	37.93	7	24.14	0	0.00	10	34.48	1	3.45	29	100.00
Others	31	23.48	33	25.00	0	0.00	66	50.00	2	1.52	132	100.00
Total (N)	**181**	**20.76**	**215**	**24.66**	**3**	**0.34**	**438**	**50.23**	**35**	**4.01**	**872**	**100.00**

Note: % = n/N; where n= number of cause, N= total number of causes

"Inadvertent causes" were the second largest causes of problems after "intentional causes". Usually "inadvertent causes" mentioned in national media were mainly due to the unintended consequences of willed human action, such as ignorant actions by humans or carelessness.

> *"... **eight youngsters, who accidentally threw cigarette butts** in the forest of Mount Selasih, Bandung Regency ... have caused at least 31 hectares of burned forest in the mountain. "(Republika, October 8, 1997).*

In addition to "intentional" and "inadvertent" causes, "accidental causes" were also increasingly called upon in national media as the causes of the problem of forest fire. "Accidental causes" were the unintended consequences beyond human control, such as the extreme heat or prolonged drought due to El Nino.

> *"Forest fires that hit Indonesia today are the impacts **caused by El Nino that occurred during the last four years**, ... in 1991 **a severe drought in Indonesia** had caused forest fires covering to an area of 88,000 ha..." (Republika, October 11, 1994).*

5.1.2.4.2 Victims of Problem

As in the global media, speakers in national media argued that “administrations”, “enterprises”, “organizations”, “society”, “nature”, and “others” were the victims of problems. Speakers mostly talked about "administration" as victim of problems, followed by "media", and "others" (**Table 5.23**).

"Nature" was the victim of problem that was widely mentioned in national media (41% of the total victims assigned by all speakers). Forests damages, for example, were the victims of problem of forest fires mentioned in national media. Wildlife, forest stands, biodiversity, and environment were also victims of "nature" mentioned by the speakers. Orangutan in Samboja, a research forest owned by the Orangutan Rehabilitation and Maintenance Centre in Kalimantan, and elephants in Way Kambas National Park Sumatra, were also victims of forest fires.

Table 5.23. Victims of Problems on Forest Fire Issues in National Media

Speakers	Victims of Problem													
	Adminis-trations		Organi-zations		Enterprises		Society		Others		Nature		Sum	
	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**0**	**0.00**	**0**	**0.00**	**6**	**9.68**	**4**	**6.45**	**27**	**43.55**	**25**	**40.32**	**62**	**100.00**
B. Non Scientists	**2**	**0.11**	**2**	**0.11**	**209**	**11.27**	**210**	**11.32**	**671**	**36.17**	**761**	**41.02**	**1,855**	100.00
Politicians	0	0.00	0	0.00	0	0.00	5	23.81	10	47.62	6	28.57	21	100.00
Administrations	0	0.00	0	0.00	119	15.95	71	9.52	254	34.05	302	40.48	746	100.00
Media	2	0.33	1	0.16	67	11.04	79	13.01	226	37.23	232	38.22	607	100.00
NGOs	0	0.00	0	0.00	4	4.30	11	11.83	38	40.86	40	43.01	93	100.00
Organizations	0	0.00	1	1.14	2	2.27	14	15.91	38	43.18	33	37.50	88	100.00
Enterprises	0	0.00	0	0.00	9	14.06	2	3.13	23	35.94	30	46.88	64	100.00
Others	0	0.00	0	0.00	8	3.39	28	11.86	82	34.75	118	50.00	236	100.00
Total	**2**	**0.10**	**2**	**0.10**	**215**	**11.22**	**214**	**11.16**	**698**	**36.41**	**786**	**41.00**	**1,917**	**100.00**

Note: % = n/N; where n= number of victim, N= total number of victims

In addition to "nature", various mentioned victims in national media were difficult to be classified under particular categories; thus, they were grouped as "others". Included under this category involve a single person or community like farmers whose farms were also burned, as well as tourists trapped at the airport because of delayed flights due to haze from forest fire, and those who were in poor health, thus they could not leave the house for work due to heavy smog which passed the threshold quality standard. Even passengers of Garuda airline became the victims of plane crash when it was flying in the middle of the smoke from forest fire. Transportation and tourism sectors seemed to be the most damaged victims. All of speakers, particularly “administration” and “media” perceived “nature” and “others” as victims of problem concerning forest fires.

“Enterprises” and "society" were the third largest victims of problems mentioned in national media after "nature" and "others". As has been widely discussed in "causers" and "causes" in both global and national media, the smog from Indonesian forest fires had endangered public health (society) not only in Indonesia but also the society in the neighbouring countries such as Malaysia, Singapore and the Philippines. Similar to the global media, not many speakers

referred to "administrations", "enterprises", or "organizations" as victims of problems. Besides blaming enterprises as the main causers of problem, “administration’s speakers” also perceived that enterprises, particularly forest company and oil palm estate, where their areas were burned, as some of the most frequent victims of problem.

5.1.2.4.3 Helpers of Problems

Similar to the analysis of statements in global media, helpers of problems in national media referred to by the speakers could be classified into nine categories, namely: "scientists", "politicians", "administrations", "enterprises", "NGOs", "organizations", "society", "nature", "others", and "media", although the later were not mentioned too often. The dominant speakers were also similar to the other interest positions, where the "administration" was placed first followed by "media" and "others" as well as any other category (**Table 5.24**).

As in global media, most of the helpers of the problems mentioned in national media were "others" that could not be classified into any particular existing categories, such as fire fighters, forest rangers, army and forest communities that helped extinguish the fire and evacuated the residents around the forest and orangutans at Wanariset Samboja. While the police assisted in law enforcement against rogue companies that performed land clearing by burning. Similarly, doctors and hospitals helped those whom experienced respiratory problems from inhaling the smokes from the forest fire that had spread over national boundaries. The local people were also included as helpers who were quite often mentioned in national media, for example:

> *"Forest fires spread everywhere ... **suppression efforts are done traditionally with local residents** after unsuccessful effort in bring in helicopters from Denpasar to extinguish fires from the air" (Kompas, October 26, 1994).*

In addition to "others", "administrations" was the second largest helpers of problem of forest fire mentioned in national media, particularly assigned by speakers of “administration” and “media”. Included under the category of

"administrations" were Forestry Service and Forest Resources Conservation Agency (BKSDA) as mentioned in "Kompas":

> *"Most of the fires were burning on fallen large trees. Several officers from ...* ***Forest Service, BKSDA****, and local police are still trying to extinguish it. "(Kompas, October 26, 1994).*

Table 5.24. Helpers of Problem on Forest Fire Issues in National Media

Speakers	Helpers of Problem																			
	Scientists		Politicians		Administration		Media		Enterprises		NGOs		Organization		Society		Nature		Others		Sum	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientist	**5**	**10.64**	**3**	**6.38**	**12**	**25.53**	**0**	**0.00**	**2**	**4.26**	**2**	**4.26**	**2**	**4.26**	**1**	**2.13**	**1**	**2.13**	**19**	**40.43**	**47**	**100.00**
B. Non Scientist	**2**	**0.12**	**23**	**1.39**	**527**	**31.96**	**6**	**0.36**	**196**	**11.89**	**42**	**2.55**	**107**	**6.49**	**19**	**1.15**	**10**	**0.61**	**723**	**43.84**	**1,649**	**100.00**
Politicians	0	0.00	4	14.29	11	39.29	1	3.57	0	0.00	0	0.00	4	14.29	0	0.00	0	0.00	9	32.14	28	100.00
Administrations	2	0.25	9	1.10	311	38.16	3	0.37	97	11.90	8	0.98	45	5.52	12	1.47	6	0.74	325	39.88	815	100.00
Media	0	0.00	6	1.67	116	32.31	2	0.56	31	8.64	11	3.06	23	6.41	4	1.11	3	0.84	165	45.96	359	100.00
NGOs	0	0.00	0	0.00	30	30.61	0	0.00	7	7.14	17	17.35	3	3.06	2	2.04	0	0.00	39	39.80	98	100.00
Organizations	0	0.00	0	0.00	3	4.41	0	0.00	8	11.76	0	0.00	24	35.29	0	0.00	0	0.00	33	48.53	68	100.00
Enterprises	0	0.00	0	0.00	10	18.87	0	0.00	23	43.40	0	0.00	1	1.89	0	0.00	0	0.00	19	35.85	53	100.00
Others	0	0.00	4	1.75	46	20.18	0	0.00	30	13.16	6	2.63	7	3.07	1	0.44	1	0.44	133	58.33	228	100.00
Total (N)	**7**	**0.41**	**26**	**1.53**	**539**	**31.78**	**6**	**0.35**	**198**	**11.67**	**44**	**2.59**	**109**	**6.43**	**20**	**1.18**	**11**	**0.65**	**742**	**43.75**	**1,696**	**100.00**

Note: % = n/N; where n= frequency of helper, N= total number of helpers

5.1.2.5 Solutions of Problem

Solutions of problems of forest fire which were stated by speakers in national media were classified into three categories, namely: economic, social, and ecological solutions (**Table 5.25**).

Table 5.25. Solutions of Problem on Forest Fire Issues in National Media

Speakers	Solutions of Problem							
	Economic		Social		Ecological		Sum	
	n	%	N	%	n	%	N	%
A. Scientist	**3**	**7.89**	**13**	**34.21**	**22**	**57.89**	**38**	**100.00**
B. Non Scientist	**99**	**8.67**	**390**	**34.15**	**653**	**57.18**	**1,142**	**100.00**
Politicians	4	20.00	9	45.00	7	35.00	20	100.00
Administrations	54	9.73	186	33.51	315	56.76	555	100.00
Media	18	7.06	79	30.98	158	61.96	255	100.00
NGOs	3	4.29	27	38.57	40	57.14	70	100.00
Organizations	5	8.77	19	33.33	33	57.89	57	100.00
Enterprises	3	7.69	13	33.33	23	58.97	39	100.00
Others	12	8.22	57	39.04	77	52.74	146	100.00
Total (N)	**102**	**8.64**	**403**	**34.15**	**675**	**57.20**	**1,180**	**100.00**

Note: % = n/N; n= frequency of a respective solution, N= total number of solutions

As with the statements in global media, most speakers in national media also believed that "ecological" was the solution of problem of forest fire, for instance the availability of water sources near the source of the fire would help solved the problems in extinguishing forest fires (Kompas, June 11, 2003). Similarly, some other news also referred to "ecological solution" as indicated by the following footage:

> *"After more than a week shrouded in thick smog, on Thursday (5/6) afternoon, the City of Pontianak **was poured by torrential rain**, hence the air in the "city of equator" felt fresh". (Kompas, June 6, 2003).*

Similarly, "social solution" was the second most mentioned solution of problem quoted in the statements on forest fire issues in national media. Included as "social solution" were the involvement or active participations of all citizens in an

effort to prevent and control forest fires, as described in the article entitled "Shared Responsibility of Forest Fires" in Kompas newspaper (May 29, 2003). Meanwhile, the least known solution of problem on forest fire mentioned by the speakers in national media was "economic solution". In line with the statements made in global media, instruments of solution put forward by speakers in national media were also classified into six categories, i.e. “economical instruments”, “informational instruments”, “procedural instruments”, “regulative instruments”, “praxis”, and “others” (**Table 5.26**).

Similar to the solution of problems stated by most speakers in global media, "praxis" was an instrument of solution of forest fire problem most widely spoken of in national media. Included under such category were: the use of satellite and other equipments to monitor the control of fire and use of aviation fleets to extinguish the fire, as written in Kompas below:

> *"... we must conduct early prevention of fire cases and **we have used a fleet flight to extinguish the fire** ..." (Kompas, November 28, 1994).*

Politicians and NGOs have rather different perception about instruments of solution concerning forest fire. Instead of “praxis”, "others" was the most frequent instrument of solution of problem assigned by politicians. NGOs, however, mostly perceived "regulative instrument" as the most important instrument of solution of problem concerning forest fire. Included as “regulative instruments” are formulation of rules for the prevention and control of forest fires, and provided strict sanctions to the perpetrators of forest fires, as written in the following part of the news article:

> *"Land and forest fires in Indonesia will always occur if the perpetrators were not given **strict law enforcement**." (Kompas, June 7, 2003).*

Table 5.26. Instruments of Solution of Problems on Forest Fire Issues in National Media

Speakers	Instruments of Solution of Problem													
	Economical		Informational		Procedural		Regulative		Praxis		Others		Sum	
	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientist	**3**	**5.77**	**9**	**17.31**	**8**	**15.38**	**13**	**25.00**	**7**	**13.46**	**12**	**23.08**	**52**	**100.00**
B. Non Scientist	**99**	**7.56**	**100**	**7.64**	**88**	**6.72**	**246**	**18.79**	**494**	**37.74**	**282**	**21.54**	**1,309**	**100.00**
Politicians	3	18.75	3	18.75	1	6.25	3	18.75	2	12.50	4	25.00	16	100.00
Administrations	54	8.29	47	7.22	38	5.84	122	18.74	256	39.32	134	20.58	651	100.00
Media	19	6.81	18	6.45	29	10.39	45	16.13	110	39.43	58	20.79	279	100.00
NGOs	4	5.00	5	6.25	3	3.75	29	36.25	27	33.75	12	15.00	80	100.00
Organizations	5	7.35	13	19.12	7	10.29	5	7.35	21	30.88	17	25.00	68	100.00
Enterprises	3	5.36	0	0.00	2	3.57	3	5.36	22	39.29	26	46.43	56	100.00
Others	11	6.92	14	8.81	8	5.03	39	24.53	56	35.22	31	19.50	159	100.00
Total (N)	**102**	**7.49**	**109**	**8.01**	**96**	**7.05**	**259**	**19.03**	**501**	**36.81**	**294**	**21.60**	**1,361**	**100.00**

Note: % = n/N; where n= frequency of a respective instrument of solution, N = total number of instruments of solution

5.1.2.6 Risk Evaluation

In national media, statements on forest fire-related "risk evaluation" were grouped into five categories: “risk occurrence probability”, “loss of natural resources”, “loss of human lives”, “loss of man-made material”, and “political relevance” (**Table 5.27**). As in the global media, speakers in national media mostly suggested "risk occurrence probability" as the future risk of forest fire, as stated by the Director of Forest Watch Indonesia, and cited in the article entitled "Over the Weak Law Enforcement, Forest Fire Will Continue" (Kompas, June 7, 2003). Equivalent were several other news, entitled "Riau Alert One for Forest and Land Fires" (Kompas, June 3, 2003) which referred to the risk occurrence probability of forest fire in Indonesia, particularly in the Province of Riau. From 53 statements about “risk evaluation” assigned by the journalists (“media”), 24 of them indicated “risk occurrence probability” as a major concern.

Table 5.27. Risk Evaluations of Forest Fire Issues in National Media

Speakers	Risk Evaluations											
	Risk occurrence probability		Loss of natural resources		Loss of human lives		Loss of man-made material		Political relevance		Sum	
	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientist	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**100.00**
B. Non Scientist	**78**	**38.05**	**65**	**31.71**	**6**	**2.93**	**36**	**17.56**	**20**	**9.76**	**205**	**100.00**
Politicians	2	25.00	2	25.00	2	25.00	2	25.00	0	0.00	8	100.00
Administrations	33	31.73	27	25.96	3	2.88	33	31.73	8	7.69	104	100.00
Media	24	45.28	21	39.62	0	0.00	1	1.89	7	13.21	53	100.00
NGOs	4	50.00	3	37.50	0	0.00	0	0.00	1	12.50	8	100.00
Organizations	7	58.33	5	41.67	0	0.00	0	0.00	0	0.00	12	100.00
Enterprises	1	33.33	1	33.33	0	0.00	0	0.00	1	33.33	3	100.00
Others	7	41.18	6	35.29	1	5.88	0	0.00	3	17.65	17	100.00
Total (N)	**78**	**21.67**	**65**	**18.06**	**6**	**1.67**	**36**	**10.00**	**20**	**5.56**	**205**	**100.00**

Note: % = n/N; where n= frequency of a respective risk evaluation, N = total number of Risk Evaluations

"Loss of natural resources" was the second largest future risks which were feared by speakers in national media. Included under such category was area of forest damage as proclaimed in Kompas on June 12, 2003. News in the same newspaper also stated that forest fires had potentially threatened the residential areas, especially the transmigrants ("loss of man-made material").

5.1.2.7 Frames

Frames of media discourse in national media were grouped into "problem's definition", which were divided into economic and environmental aspects, "causal interpretation" comprised of human and natural causes, "impact evaluation" whether forest fire responsible for global climate change or not, and "policy recommendation", which perceived speakers' views in national media towards the appropriate regulatory recommendations in addressing the problem of forest fires which skewed to either national/local regulations or international convention (**Table 5.28**).

Similar to the problem's definition in global media, forest fires discourses in national media also mostly discussed the environmental issues rather than economic issues. That is, in perspectives of the majority of speakers in national media, forest fires were related closer to environmental issues rather than economic. Likewise, in interpreting the causes of forest fires, majority of speakers in national media viewed human activities as the main causes of forest fire, such as land clearing, estate development, shifting cultivation and forest encroachment. This was clearly indicated by the article under the heading of "90% of Forest Fires in Riau were caused by Human" (Kompas, June 7, 2003) and also commonly found in many other articles, such as the article entitled "Shifting Cultivation as the Cause of Forest Fire" (Kompas, March 10, 2003).

In national media, not a single speaker spoke on the relevance of global forest fires to climate change, thus the speakers' perspectives on the link between forest fires and global climate change in national media were unknown. Regarding the "policy recommendation" only a few speakers in national media who recommended the need for "international convention" to combat forest fire.

One statement was made by Otto Sumarwoto, an environmental expert from Padjadjaran University in Bandung, in his article entitled “Utilizing the Kyoto Protocol for Dealing with Forest Fire" (Kompas, June 17, 2003). Recommendation on the need for international convention for handling forest fires was a minority view because most of the speakers in national media regarded “national regulations” as having more significance in preventing and overcoming forest fire, compared to international conventions.

Table 5.28. Frames of Forest Fire Issues in National Media

Speakers	Problem's definition				Causal interpretation				Impact evaluation				Policy recommendation				Sum	
	Economy		Ecology		Human Causes		Natural Causes		FF are responsible for GCC		FF are not responsible for GCC		International Conventions		National Regulations			
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientist	**0**	**0.00**	**36**	**39.56**	**19**	**20.88**	**4**	**4.40**	**0**	**0.00**	**0**	**0.00**	**1**	**1.10**	**31**	**34.07**	**91**	**100.00**
B. Non Scientist	**24**	**0.87**	**1,122**	**40.65**	**491**	**17.79**	**98**	**3.55**	**0**	**0.00**	**0**	**0.00**	**99**	**3.59**	**926**	**33.55**	**2,760**	**100.00**
Politicians	2	4.78	15	35.71	8	19.05	0	0.00	0	0.00	0	0.00	2	4.76	15	35.71	42	100.00
Administrations	10	0.81	502	40.71	208	16.87	42	3.41	0	0.00	0	0.00	33	2.68	438	35.52	1.233	100.00
Media	3	0.42	298	41.80	123	17.25	24	3.37	0	0.00	0	0.00	35	4.91	230	32.26	713	100.00
NGOs	3	1.81	59	35.54	48	28.92	1	0.60	0	0.00	0	0.00	3	1.81	52	31.33	166	100.00
Organizations	1	0.74	60	44.44	16	11.85	11	8.15	0	0.00	0	0.00	11	8.15	36	26.67	135	100.00
Enterprises	2	2.13	37	39.36	14	14.89	8	8.51	0	0.00	0	0.00	1	1.06	32	34.04	94	100.00
Others	3	0.80	151	40.05	74	19.63	12	3.18	0	0.00	0	0.00	14	3.71	123	32.63	377	100.00
Total (N)	**24**	**0.84**	**1,158**	**40.62**	**510**	**17.89**	**102**	**3.58**	**0**	**0.00**	**0**	**0.00**	**100**	**3.51**	**957**	**33.57**	**2,851**	**100.00**

Note: % = n/N; where n= frequency of a respective frame, N = total number of frame

5.1.3 Disscussion: Comparison Between Global and National Media

This section discussed the comparison between global and national media with regard to several important matters, namely: perspectives of media towards forest fire, roles of scientists in the media, scope of event of forest fire (global vs. local concerns), interest positions, and framing.

5.1.3.1 Perspectives of Media Towards Forest Fire

If viewed from the "valence of event", global and national media had different perspectives on forest fire. In global media, 95% of the articles on forest fire had "negative" valence, while most of forest fire articles in national media had "ambivalent" valence (**Figure 5.5**).

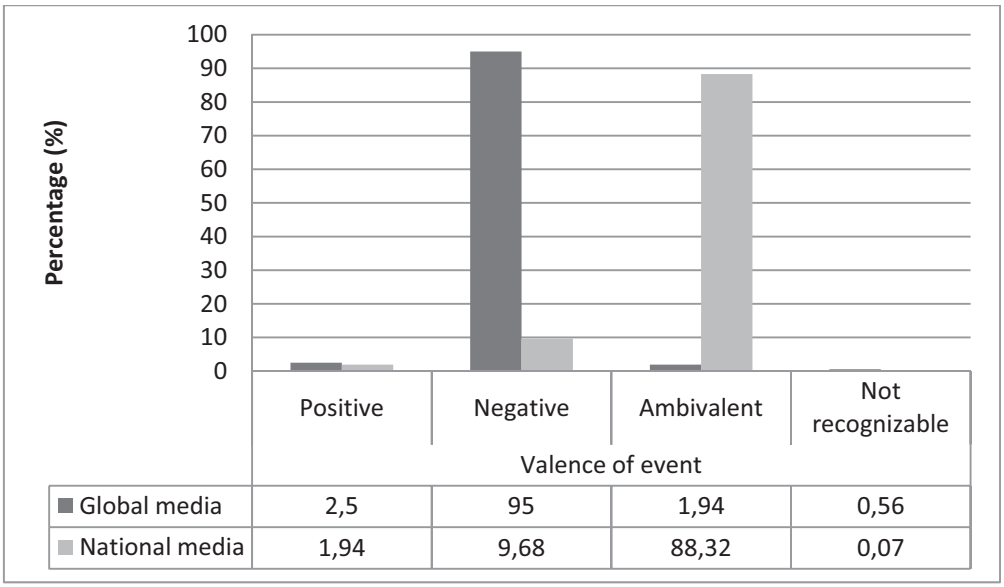
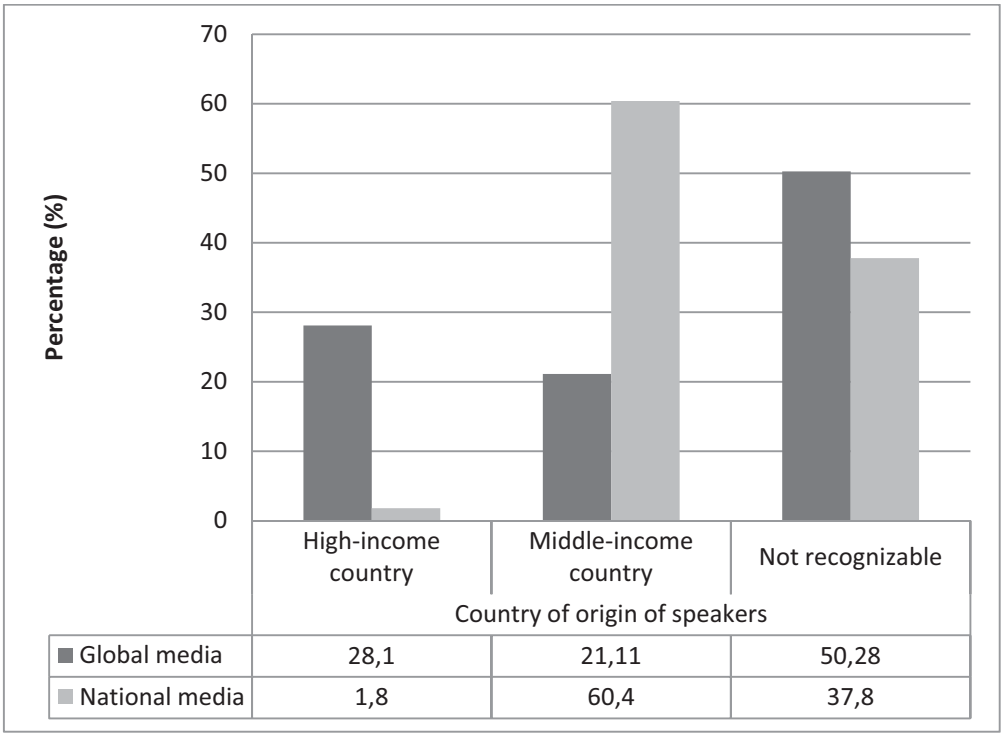


Figure 5.5. Valence of Forest Fire Event in Global and National Media

Based on the valence of events as shown in **Figure 5.5**, in general, national media shared more neutral views of forest fire. Apart from describing problems related to forest fire, articles in national media usually discussed solutions as well as efforts to overcome forest fire related problems. Meanwhile, articles on forest fire reported in global media, often discussed negative impacts of forest fire only.

Differences in perspectives between global and national media could also occur due to the differences in the origin of speakers (**Figure 5.6**).



	High-income country	Middle-income country	Not recognizable
Global media	28,1	21,11	50,28
National media	1,8	60,4	37,8

Figure 5.6. Countries of Origin of Speakers in Global and National Media

In national media, most speakers originated from middle-income countries, while speakers in global media were largely have unrecognized countries of origin. Out of the speakers with recognized country of origin, the number of speakers originated from high-income countries dominated the discourses on global forest fire in the media. The imbalance of origin of speakers led to imbalanced writing of the problems on forest fire in global media, which were dominated by perspectives of the speakers from high-income countries.

5.1.3.2 The Role of Scientists in Media

According to Dunn (2000:45) recognizing the roles of scientists is important to ensure “knowledge utilization” in policy making. Utilization of knowledge by policy makers is useful to improve policy-making process and outcome. Nonetheless, the role of scientists in forest fire discourse was not significant, as opposed to non-scientists who were very dominant speaking actors in the

media. The contribution of scientists through statements on forest fire in global media was 11.67% or 42 out of a total of 360 statements, and in national media, their contribution was only 2.49% or 36 out of the total 1,447 statements (**Figure 5.7)**.

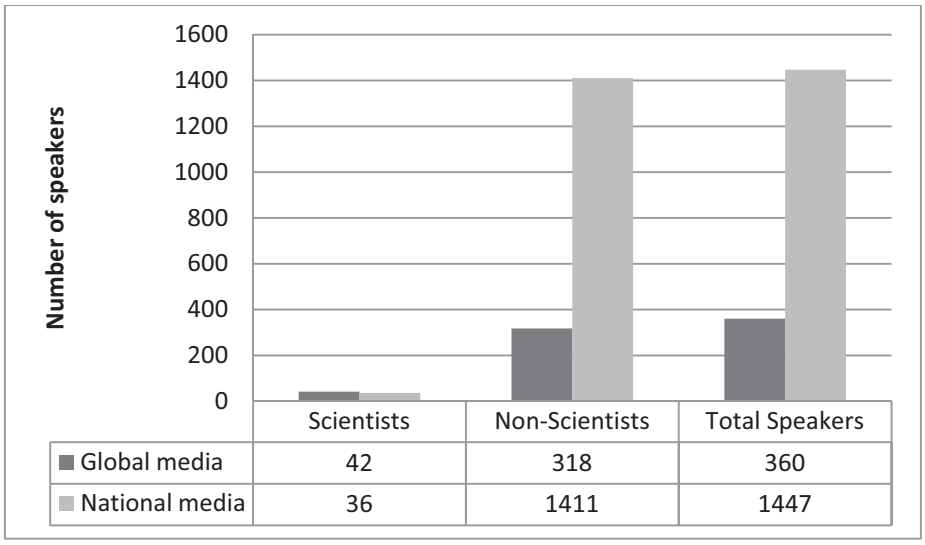


Figure 5.7. Number of Scientist and Non-Scientist Speaking Actors in Global and National Media

Judging from the number and proportion of "scientists", global media considered more scientists as the speaking actors (42 speakers or 11.67%) compared to national media (36 speakers or 2.49%). Borrowing the ideas from Dunn (2000), this indicated that the knowledge utilization were better in global media than in national media in responding to forest fire issues.

Looking at the distribution of non scientist speaking actors in media, “administration” was one of the most important speaking actors in news media, both at global and national levels. Forest fire was usually related to inter-sectoral issues, hence both global and national media mostly requested non-forest administration to obtain broader information concerning forest fire (**Figure 5.8**).

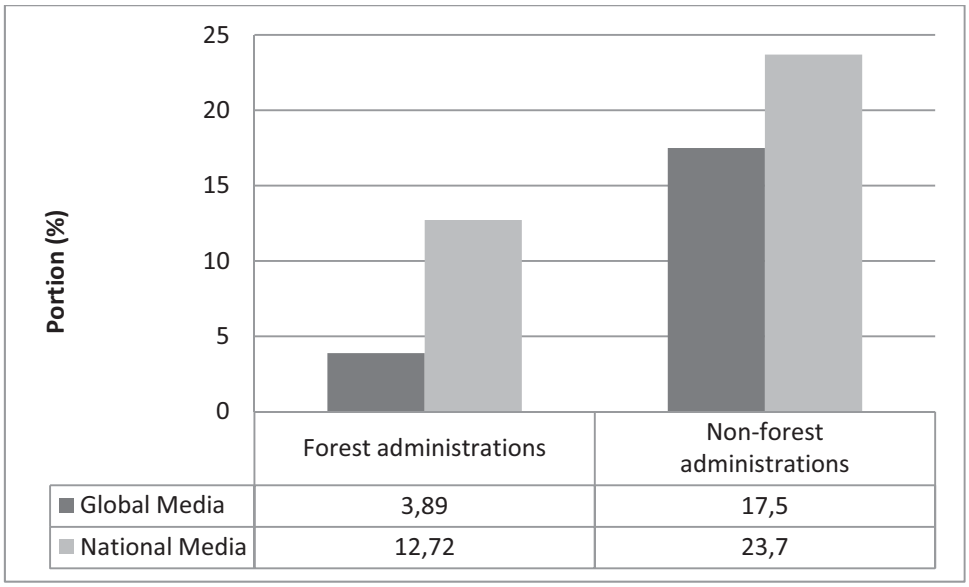


Figure 5.8. Portions of Forest and Non-Forest Administration's Speaking Actors in Global and National Media

A total of 17.5% speakers in global media were "non-forest administrations" which were higher than "forest administrations" (3.89%). Likewise, speakers of forest fire in national media originated from "non-forest administration" reached 23.7%, which was also higher than the proportions of speakers from "forest administration", which was only 12.72%.

It is important to note that in many cases of forest fires in Indonesian regions, forest administration operated under the supervision of, or coordinated by a non-forest administration, such as an environmental minister, special task force, Regional Development Planning Agency *(Bappeda)*, Meteorology & Geophysics Agency (BMG), or Regional Agriculture and Estate Office. In respond to forest fire, forest administrations would often spoke concerning the forest only.

The opinions of journalists ("media") were strongly influenced by the direction of forest fire issues in media. More than 30% of forest fire statements in national media were given by journalists (own statement of media) (**Table 5.19**), while journalists of global media contributed more than 22% of the statements on forest fire issues (**Table 5.5**). "Organizations" was also a moderately important speaking actor in global media, but not in national media. The term "organization" referred to forest and non-forest organizations. In global media,

12.78% of the speaking actors came from organizations, where most were non-forest organizations. While in national media, speakers that represented "organization" were less than 5% out of the total speakers.

5.1.3.3 Forest Fire: Global or Local Concerns?

According to the number of statements and articles on forest fire issues reported in news media, it could be observed that forest fire issues received much more attention at national level rather than global concern (**Figure 5.9**).

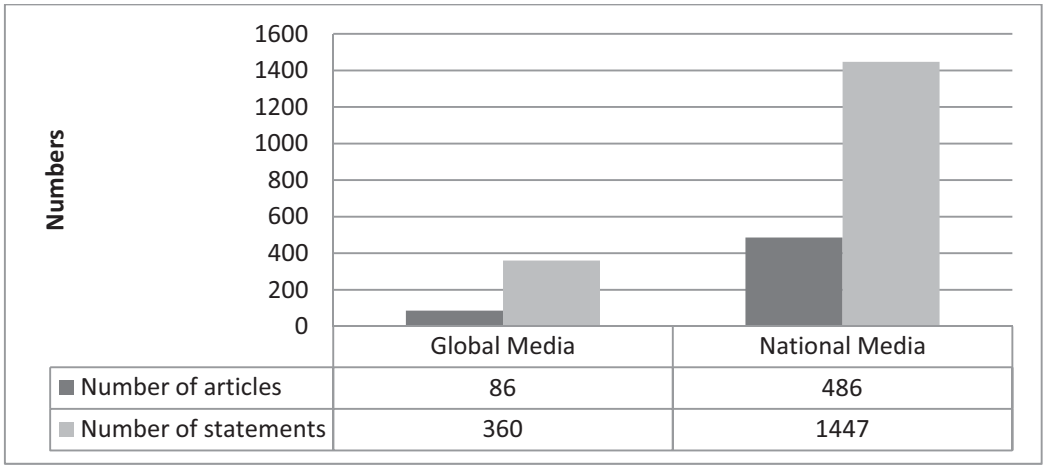
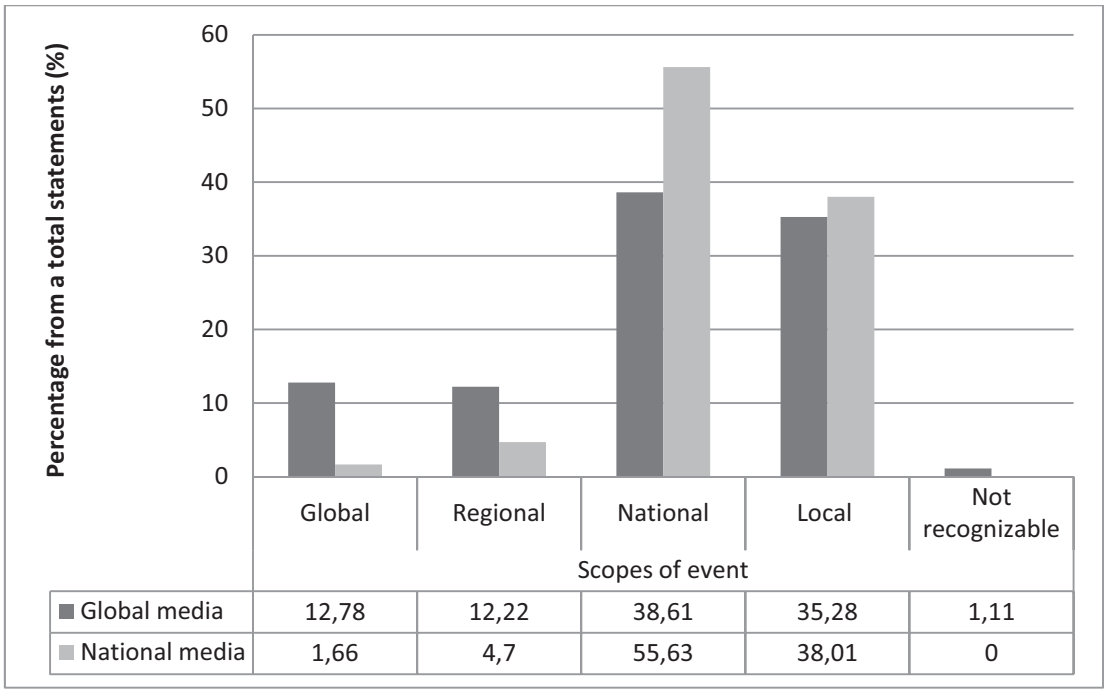


Figure 5.9 Distribution of Articles and Statements on Forest Fire in Global and National Media

Two most reputable national media, i.e. Kompas and Republika, reported a total of 486 articles including 1,447 statements on forest fire within the period of ten years (1994-2003), while in the same period the two global media, i.e. International Herald Tribune and Time Magazine reported only 86 articles (360 statements). This suggested that from the perspectives of common public, forest fire was still considered as local or national issues and less concern at global level.

Referring to the scope of event of forest fire issue, it could be seen that global media mostly did not concern the global scope (**Figure 5.10**).

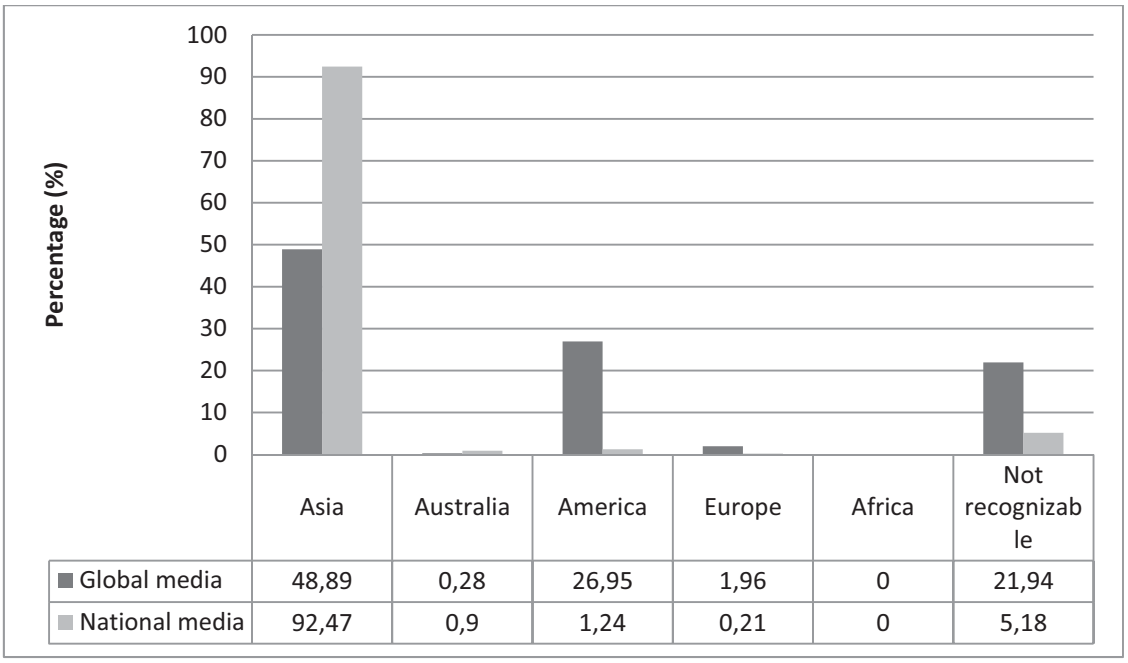


	Global	Regional	National	Local	Not recognizable
Global media	12,78	12,22	38,61	35,28	1,11
National media	1,66	4,7	55,63	38,01	0

Figure 5.10. Scopes of Events in Global and National Media

Overall, out of the total global statements in the media, only 12.78% had global scope of events and 12.22% of regional ones. As the scope of events in national media, global media were also largely accommodated local and national forest fire issues. Therefore, any claims which stated that global media focused on global concerns was unrealistic, since they do not only provided views globally but often referred locally.

Based on the location of events by continent, most of media coverage on forest fires in both global and national media was the Asian continent (**Figure 5.11**).



	Asia	Australia	America	Europe	Africa	Not recognizable
Global media	48,89	0,28	26,95	1,96	0	21,94
National media	92,47	0,9	1,24	0,21	0	5,18

Figure 5.11. Locations of Events of Forest Fires by Continent in Global and National Media

It is reasonable when the national media referred to Asian continent as the most frequent forest fire issues, since the highest intensity of forest fire was located in Asia particularly in Indonesia. The high local content of the national media was also not surprising because the scope of readers was only at national and local levels. Referring to location of events by continent, almost 50% of forest fire issues reported in global media, i.e. in International Herald Tribune and Times Magazine, referred to Asia as the most frequent locations of forest fires.

5.1.3.4 Interest Positions

Both in global and national media, most speakers referred to "others" as the causers of forest fire problems. However, there were some fundamental differences between the global media and national media. In global media, nature was considered an important causer of problem by more than 26% of speakers, while only 5.73% speakers in the national media who affirmed nature as causer of problem. This occurred because perception of "nature" such as El-Nino phenomenon at national level, tend to be positioned as an enabling factor for the occurrence of forest fire and not as the main causer of the problem.

In addition to differing views of "nature" as the causer of problem, the position of "enterprises" in global and national media was also different. Speakers in national media who viewed the position of "enterprises" as the causer of the problem of forest fire were very large, close to 38%, whilst, in global media, the number only reached about 13%.. This showed that in the event of forest fires, "enterprises" tend to get a "negative image" in national media, whereas the views of global media of "enterprises" tend to be more neutral. The negative image of "enterprises" at national level was congruent with the views of speakers on the "causes of problems". More than half the speakers in national media (50.23%) referred to "intentional causes" as the main cause of forest fire, while only 17% of the speakers in global media affirmed similar thought. In the case of Indonesia, "intentional causes" were generally performed by "enterprises", who performed land burning for land clearance for the development of new estate lands.

Global and national media also perceived a slightly different position for "victims of problems". Both media equally regarded "nature" and "others" as the major victims of forest fires. However, speakers in national media were more inclined to see "nature" as the most important victim of problem. Meanwhile, global media considered "others", such as farmers, tourism sectors and transportation activities as the major victims of forest fire problems.

In looking at "helpers of the problem", both global and national media similarly perceived "others" as a helper of the problem. This indicated the diversity of speakers in both media in viewing "helpers of problem" resulting in the difficulty to place most of them under particular category. However, it is interesting to note the differences existed in global and national media when viewing the roles of "politicians" and "administration". In global media, politicians, particularly government politicians, were one of the major "helpers of problem", as stated by more than 25% of speakers, whereas in national media there were only 1.53% of the speakers who said similar thing. Instead of "politicians", almost 32% of the statements in national media affirmed "administrations" as a helper of problem of forest fire. This was due to the fact that, in general, global media quoted more statements from high-level government politicians, such as president, governor, mayor or regency head in responding to forest fire issues.

On the other hand, national media communicated more easily and made interview schedules with "administrations" rather than "government politician", thus positioned "administration" as a helper of problem of forest fires in Indonesia.

5.1.3.5 Frames

There were some similar "frames" from both global and national media in the discourse of forest fire. In defining the problem, both media equally tend to place forest fire into an environmental dimension rather than economic. In addition, both media saw the strengthening of "national regulations" as a more effective means than "international conventions" in preventing and combating forest fires.

National media clearly interpreted "human factors" as the main cause of forest fires and very few statements pointed to "natural factors". In general, global media also stated "human factors" as the main cause of forest fires, although statements on "natural factors" as the main cause did not differ much.

In evaluating the impacts of forest fires, global and national media also had different position. Global media tend to view forest fire to be responsible for Global Climate Change, whereas no single statement in national media connected the issue of forest fire with global climate change. This suggested that for national media, forest fire issues were separated from global climate change issues, whilst the global media tend to look at the issue of forest fire as an integral part of global issue of climate change.

5.2 Scientific Discourse on Forest Fire

This section discusses forest fire discourses in international and national journals.

5.2.1 Global Scientific Discourses on Forest Fire

This study evaluated the discourses on forest fire in five international journals, i.e. Canadian Journal of Forest Research (CJFR), Forest Ecology and Management (FEM), Forest Science (FS), Forestry, and the Journal of Forestry (JF).

5.2.1.1 Distribution of Articles and Statements

This study analyzed as many as 68 articles and 2,873 statements on forest fire occurring in international journals (**Table 5.29**).

Table 5.29. Number of Articles and Statements on Forest Fires in International Journals

Sources	Articles		Statements	
	n	%	n	%
Canadian Journal of Forest Research (CJFR)	23	33.83	846	29.45
Forest Ecology and Management (FEM)	41	60.29	1.909	66.45
Forest Science (FS)	2	2.94	68	2.37
Forestry	0	0.00	0	0.00
Journal of Forestry (JF)	2	2.94	50	1.74
Total (N)	**68**	**100.00**	**2.873**	**100.00**

Note: % = n/N; where n= number of article or statement, N= 68 (total number of articles), N= 2,873 (total number of statements)

The number of articles published in each international journal was as follows: Canadian Journal of Forest Research (CJFR) 42 articles (132 statements), Forest Ecology and Management (FEM) 41 (1.909), Forest Science (FS) 2 (68), Journal of Forestry (JF) 2 (50) and not a single article on forest fire that was

published in the "Forestry" journal. This indicated that of the five international journals under analysis, scientific discourses on forest fire were practically found in CJFR and FEM, but received less attention from the other three journals.

5.2.1.2 Events

Most of the forest fire discourse in international journals had "ambivalent" valence while the valence of the 32% forest fire articles in international journals that were analyzed were "unrecognizable", 11.76% were "positive", and 5.88% were "negative". This means that scientific discourses on forest fire in international journals generally discussed not only the "positive" or "negative" side, but discussed forest fire in a more balanced perspective (**Table 5.30**).

Table 5.30. The Valence and Locations of Events on Forest Fire Issues in International Journals

	Source								Total	
	CJFR		FEM		FS		JF			
	n	%	n	%	n	%	n	%	N	%
A. Valence of Events	**23**	**100.00**	**41**	**100.00**	**2**	**100.00**	**2**	**100.00**	**68**	**100.00**
Positive	0	0.00	8	19.51	0	0.00	0	0.00	8	11.76
Negative	1	4.35	2	4.88	0	0.00	1	50.00	4	5.88
Ambivalent	15	65.22	19	46.34	0	0.00	0	0.00	34	50.00
Not Recognizable	7	30.43	12	29.27	2	100.00	1	50.00	22	32.35
B. Scopes of Events	**23**	**100.00**	**41**	**100.00**	**2**	**100.00**	**2**	**100.00**	**68**	**100.00**
Global	0	0.00	4	9.76	0	0.00	0	0.00	4	5.88
Regional	2	8.70	2	4.88	0	0.00	0	0.00	4	5.88
National	10	43.48	13	31.71	0	0.00	1	50.00	24	35.29
Local	8	34.78	21	51.22	2	100.00	1	50.00	32	47.06
Not Recognizable	3	13.04	1	2.44	0	0.00	0	0.00	4	5.88

Note: % = n/N; where n= frequency of the respective valence or scope of event, N = total number of articles

Looking at the scope of the event, most of the articles on forest fires that were published in international journals had "local" scope (47.06%) and "national" scope (35.29%). Only 5.88% of forest fire articles in international journals had "global" or "regional" scope of events. This indicated that although an international journal had a broad range of readers, when viewed from the scope of the event, most of the perspectives of the articles were limited to "local" or "national" only, and not many highlighted on global issues. This narrowed perspective was also shown by the "country of event" of forest fire from articles published in international journals (**Table 5.31**).

Table 5.31. Countries of Events of Forest Fire Issues in International Journals

Countries	Sources								Sum	
	CJFR		FEM		FS		JF			
	n	%	n	%	n	%	n	%	n	%
High Income Countries	**19**	**82.61**	**31**	**75.61**	**2**	**100.00**	**2**	**100.00**	**54**	**79.41**
Australia	0	0.00	5	12.20	0	0.00	0	0.00	5	7.35
Canada	11	47.83	1	2.44	1	50.00	0	0.00	13	19.12
Finland	0	0.00	1	2.44	0	0.00	0	0.00	1	1.47
Netherland	0	0.00	1	2.44	0	0.00	0	0.00	1	1.47
Sweeden	1	4.35	1	2.44	0	0.00	0	0.00	2	2.94
Spain	0	0.00	1	2.44	0	0.00	0	0.00	1	1.47
The USA	7	30.43	21	51.22	1	50.00	2	100.00	31	45.59
Middle Income Countries	**0**	**0.00**	**4**	**9.76**	**0**	**0.00**	**0**	**0.00**	**4**	**5.88**
Bolivia	0	0.00	1	2.44	0	0.00	0	0.00	1	1.47
Brazil	0	0.00	2	4.88	0	0.00	0	0.00	2	2.94
Mexico	0	0.00	1	2.44	0	0.00	0	0.00	1	1.47
Low Income Countries	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Not recognizable	4	17.39	6	14.63	0	0.00	0	0.00	10	14.71
Total (N)	**23**	**100.00**	**41**	**100.00**	**2**	**100.00**	**2**	**100.00**	**68**	**100.00**

Note:% = n/N; where n= frequency of the respective country of event, N = total number of articles

Looking at the countries of events of forest fires from articles published in international journals, the majority (nearly 80%) took place in "high-income countries", especially in USA and Canada. Only 5.88% countries of events of forest fire in international journals occurred in "middle-income countries", and 14.71% were "not recognizable". Countries of events of forest fires in "middle income countries" were all located in the continent of America, namely: Bolivia, Brazil, and Mexico. None of the articles out of the five international journals discussed forest fires in Indonesia, although in 1997 and 1998 Indonesia experienced great forest fires that received world-wide attention and many were covered by international media. This fact showed the imbalance in international scientific discourse that tend to give more attention to the problems occurring in "high-income countries", particularly in locations around the areas where these journals were published.

5.2.1.3 Authors and Speakers

In scientific media discourse, one of the most important things to be done is to analyze the origin and distribution of authors and speakers. For articles published in international journals, in general the scientists were the main authors. To recognize the strength of linkages between forest fire issues with certain scientific fields, this section would evaluate the field of science of the authors (**Table 5.32**).

Table 5.32. Fields of Science of Authors on Forest Fire Issues in International Journals

Fields of Science	CJFR		FEM		FS		JF		Sum	
	n	%	n	%	n	%	n	%	n	%
Forest Science	12	52.17	27	65.85	1	50.00	2	100.00	42	61.76
Nature Conservation	0	0.00	2	4.88	0	0.00	0	0.00	2	2.94
Natural Science	9	39.13	10	24.39	0	0.00	0	0.00	19	27.94
Social Science	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Other Sciences	2	8.70	0	0.00	1	50.00	0	0.00	3	4.41
Not Recognizable	0	0.00	2	4.88	0	0.00	0	0.00	2	2.94
Total (N)	**23**	**100.00**	**41**	**100.00**	**2**	**100.00**	**2**	**100.00**	**68**	**100.00**

Note: % = n/N; where n= frequency of authors, N = total number of articles

More than 61% of the fields of authors on forest fire articles published in international journals were forest science, followed by about 28% natural science. There were only few scientists' with backgrounds other than these two fields of science, and not even a single social scientist wrote an article about forest fires in the five international journals. This showed that the five international journals put more emphasis on the technical aspects of forest fires and paid less concern with social dimensions of forest fires. Based on the country of origin, the authors in the five international journals were classified into "high-income countries", "middle income countries", "low income countries", and "not recognizable" (**Table 5.33**).

Table 5.33. Origin of Countries of Authors on Forest Fire Issues in International Journals

Country of Authors	CJFR		FEM		FS		JF		Sum	
	n	%	n	%	n	%	n	%	n	%
High Income Countries	**22**	**95.65**	**37**	**90.24**	**2**	**100.00**	**2**	**100.00**	**63**	**92.65**
Australia	0	0.00	6	14.63	0	0.00	0	0.00	**6**	**8.82**
Canada	11	47.83	1	2.44	1	50.00	0	0.00	**13**	**19.12**
Finland	0	0.00	1	2.44	0	0.00	0	0.00	**1**	**1.47**
Netherland	0	0.00	1	2.44	0	0.00	0	0.00	**1**	**1.47**
Spain	0	0.00	1	2.44	0	0.00	0	0.00	**1**	**1.47**
Sweden	1	4.35	1	2.44	0	0.00	0	0.00	**2**	**2.94**
United Kingdom	0	0.00	1	2.44	0	0.00	0	0.00	**1**	**1.47**
US	10	43.48	25	60.98	1	50.00	2	100.00	**38**	**55.88**
Middle Income Countries	**0**	**0.00**	**2**	**4.88**	**0**	**0.00**	**0**	**0.00**	**2**	**2.94**
Brazil	0	0.00	1	2.44	0	0.00	0	0.00	**1**	**1.47**
Mexico	0	0.00	1	2.44	0	0.00	0	0.00	**1**	**1.47**
Low Income Countries	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
Not Recognizable	1	4.35	2	4.88	0	0.00	0	0.00	**3**	**4.41**
TOTAL (N)	**23**	**100.00**	**41**	**100.00**	**2**	**100.00**	**2**	**100.00**	**68**	**100.00**

Note: % = n/N; where n= frequency of authors, N = 68 (total number of articles)

Authors of "high-income countries" making up more than 92% of articles on forest fire in international journals were mostly from USA and Canada.

Furthermore, there were only less than 3% of the authors who were from "middle-income countries", namely Brazil and Mexico. None of the "middle-income countries" authors were from countries outside the continent of America. The dominance of authors from "high-income countries" and "American continent" produced an imbalance perspective with regard to forest fire issues which tend to consider more interests to their importance and less attention to problems of forest fires which actually occurred more common in tropical countries, generally classified as "middle or low income countries", and located outside the American continent. Consequently, "knowledge utilization" of articles in international journals was limited only in high-income countries, particularly in North America. In middle and low-income countries, "knowledge" offered by international journals were less relevant since very few methods, means, approaches, and solutions were appropriate for the context of tropical countries which, in reality, experienced more forest fires.

In accordance to the scope of readers, most speakers in international journals were scientists. However, it is necessary to recognize the extent of the roles of non-scientists speaking actors in international journals. In such cases, non-scientists could be classified into seven groups, namely: politicians, administrations, media, NGOs, organizations, enterprises, research and others (**Table 5.34**).

Apart from scientists, statements in international journals were mostly categorized as "others" with 337 speakers and "organizations" with 46 speakers. In general, the referred "organizations" were those that were well known and had credibility, such as FAO or the World Bank. There was only one statement from "enterprises" and "politicians", while none of the statements in international journals were made by "administrations", "media", and "NGOs".

Table 5.34. Speakers on Forest Fire issues in International Journals

Speakers	CJFR		FEM		FS		JF		Sum	
	n	%	n	%	n	%	n	%	n	%
A. Scientists	**696**	**82.27**	**1,695**	**88.79**	**62**	**91.18**	**35**	**70.00**	**2,488**	**86.60**
a. Forest science	97	11.47	615	32.22	13	19.12	8	16.00	733	25.51
b. Non forest science	598	70.69	1,080	56.57	49	72.06	27	54.00	1,754	61.05
c. Not Recognizable	1	0.12	0	0.00	0	0.00	0	0.00	1	0.03
B. Non Scientists	**150**	**17.73**	**214**	**11.21**	**6**	**8.82**	**15**	**30.00**	**385**	**13.40**
Politicians	**0**	**0.00**	**1**	**0.05**	**0**	**0.00**	**0**	**0.00**	**1**	**0.03**
a. Politician government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
b. Politician non government	0	0.00	1	0.05	0	0.00	0	0.00	1	0.03
Administrations	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
a. Forest administration	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
b. Non forest administration	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Media	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
NGOs	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
a. Forest NGO	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
b. Non Forest NGO	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	**13**	**1.54**	**28**	**1.47**	**5**	**7.35**	**0**	**0.00**	**46**	**1.60**
a. Forest organization	4	0.47	14	0.73	3	4.41	0	0.00	21	0.73
b. Non forest organization	9	1.06	14	0.73	2	2.94	0	0.00	25	0.87
Enterprises	**0**	**0.00**	**1**	**0.05**	**0**	**0.00**	**0**	**0.00**	**1**	**0.03**
a. Forest enterprises	0	0.00	1	0.05	0	0.00	0	0.00	1	0.03
b. Non forest enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Others	137	16.19	184	9.64	1	1.47	15	30.00	337	11.73
TOTAL (N)	**846**	**100.00**	**1,909**	**100.00**	**68**	**100.00**	**50**	**100.00**	**2,873**	**100.00**

Note: % = n/N; where n= frequency of speakers. N = 2,873 (total number of statements)

5.2.1.4 Interest Positions

In general, forest fire discourse in international journal contained a lot of research about the effects of forest fire on ecology, particularly on the impacts of forest fire on soil conditions, the possibility of succession and post-fire vegetation composition. Further discussions were on the efforts to restore the formerly burnt forest areas and efforts of future forest fire prevention based on the phenomena and natural phenomena known to trigger forest fire. In such cases, the actors could act as "causers", "victims", or "helpers".

5.2.1.4.1 Causers

In forest fire discourse in international journals, out of the eight categories of causer of problem coded, only four were mentioned by the speakers, these were: "politicians", "society", "nature", and "others" (**Table 5.35**).

Table 5.35. Causers of Problem on Forest Fire Issues in International Journals

Speakers	Causers of Problem on Forest Fire Issue									
	Politicians		Society		Others		Nature		Sum	
	n	%	n	%	n	%	n	%	N	%
A. Scientists	1	0.05	26	1.19	1,693	77.48	465	21.28	2,185	100.00
B. Non-Scientists	**0**	**0.00**	**1**	**2.94**	**26**	**76.48**	**7**	**20.59**	**34**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	1	100.00	1	100.00
Administrations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Media	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	0	0.00	1	3.13	26	81.25	5	15.63	32	100.00
Enterprises	0	0.00	0	0.00	0	0.00	1	100.00	1	100.00
Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total (N)	**1**	**0.05**	**27**	**1.22**	**1,719**	**77.47**	**472**	**21.27**	**2,219**	**100.00**

Note: % = n/N; where n= frequency of the respective causer. N = total number of causers

The category of "others" was the most widely known causer of problem of forest fire mentioned in international journals (77.47% of total causers). From 2,185 causers assigned by scientists, 1,693 of them were “others”. Some examples of causers of problems that fell into the category of "others" in international journals include, land clearing activities, logging and burning, forest regimes, all of which led to forest fires. In addition to "others", another widely mentioned causer of problem was "nature" (21.27%), where mostly related to climate, including weather variables such as precipitation, wind speed, relative humidity which could trigger the occurrence of fires (CJFR Vol. 31:854, 2001). Outside the categories of "others" and "nature", the causers of problems found in the statements of international journals were "politicians" and "society", although in a very small number.

To find out more about the causes of problems in the discourse of forest fires, it was necessary to conduct an evaluation of the "causes of problems". As already mentioned in previous sections, in this study, the causes of problems could be classified into five categories, namely: "accidental", "inadvertent", "mechanical", "intentional", and "others" (**Table 5.36**).

As with "causers of problem", the category of "others" was the "causes of problem" of forest fire that was widely mentioned in international journals, which relate to human factor that could not be classified in any particular category. Among the "causes of problems" considered under the category of "others", include "socio-economic process" and "changing the composition and structures of vegetation communities", as stated in the following statement:

> *“These changes (of **composition and structures of vegetation communities**) may have resulted in increases the magnitude and frequency of wildfires.” (FEM Vol. 147:26, 2001).*

Table 5.36. Causes of Problem on Forest Fire Issues in International Journals

Speakers	Causes of Problem											
	Accidental Causes		Inadvertent Causes		Mechanical Causes		Intention-al Causes		Others		Sum	
	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**427**	**21.35**	**2**	**0.10**	**19**	**0.95**	**79**	**3.95**	**1.473**	**73.65**	**2,000**	**100.00**
B. Non Scientists	**8**	**25.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**24**	**75.00**	**32**	**100.00**
Politicians	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Administrations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Media	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	6	20.00	0	0.00	0	0.00	0	0.00	24	80.00	30	100.00
Enterprises	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
TOTAL (N)	**435**	**21.41**	**2**	**0.10**	**19**	**0.94**	**79**	**3.89**	**1.497**	**73.67**	**2,032**	**100.00**

Note: % = n/N; where n= frequency of cause. N = total number of causes

The second most mentioned "causes of problem" in international journals was "accidental causes", such as the El-nino phenomenon, long session drought, fire regimes, charcoal, and lightning. Here is an example of a statement in CJFR:

> *"Most of the area burned by wildfire is **the result of lightning-ignited wildfire**."* (CJFR Vol. 3: 860, 2001).

Several speakers also mentioned the causes of forest fires were "intentional", such as the conversion of forest land into non-forest areas (landuse changes). Sometimes in a statement, the mentioned cause of forest fire was a

combination of several causes, such as "accidental causes" and "intentional causes "as shown in the following statement:

> *"... wild land fires and desertification processes seem to be fostered by a synergetic interaction between **climate** and **land-use changes**." (FEM Vol. 147:33, 2001).*

5.2.1.4.2 Victims

Based on the statements on forest fire in international journals, there were only two categories of victims of problems on forest fire issues raised by the speakers, i.e., "nature" and "others" (**Table 5.37**). Scientific discourse on forest fire in the five international journals emphasized the effects of forest fire on the ecology and its reversibility efforts so that there were no victims both with regard to human and social economic sectors such as health, transportation, trade, tourism, as practically mentioned in media discourses.

Table 5.37. Victims of Problem on Forest Fire Issues in International Journals

Speakers	Victims of Problems				Sum	
	Nature		Others			
	n	%	n	%	N	%
A. Scientists	**1,970**	**98.65**	**27**	**1.35**	**1,997**	**100.00**
B. Non Scientists	**30**	**93.75**	**2**	**6.25**	**32**	**100.00**
Politicians	1	100.00	0	0.00	**1**	100.00
Administrations	0	0.00	0	0.00	**0**	0.00
Media	0	0.00	0	0.00	**0**	0.00
NGOs	0	0.00	0	0.00	**0**	0.00
Organizations	28	93.33	2	6.67	**30**	100.00
Enterprises	1	100.00	0	0.00	**1**	100.00
Others	0	0.00	0	0.00	**0**	0.00
Total (N)	**2,000**	**98.57**	**29**	**1.43**	**2,029**	**100.00**

Note: % = n/N; where n= frequency of victim. N = total number of victims

Most of the "victims of the problem" of forest fire in international journals were "nature" (98.57% of victims). This indicated that the perspective of international

journals on victims of forest fire problem was towards "nature". There were many examples of statements indicating this, among them were:

> *"... ground fires are **degrading forest structures** ..."* (FEM Vol. 157:131, 2002)

> *"Wildfires **eliminate plant cover** and leave the soil unprotected against the impact of rain drops"* (FEM Vol. 147:25, 2001).

> *"... intensified fire regime due to climate change ... **decrease carbon storage in soils and biomass, reduction in old growth stands, and hence in late successional species** ...have significant consequences for biodiversity."* (CJFR Vol. 31:862, 2001).

In addition to nature, "victims of problem" of forest fire that was mentioned in international journals were very diverse, and so was categorized as "others".

5.2.1.4.3 Helpers

Based on the analysis of existing statements in international journals, helpers of the problems could be grouped into four categories, namely: "scientists", "enterprises", "nature", and "others" (**Table 5.38**).

Table 5.38. Helpers of Problem on Forest Fire Issues in the International Journals

Speakers	Scientists		Enterprises		Nature		Others		Sum	
	n	%	n	%	n	%	n	%	N	%
A. Scientists	**1**	**0.24**	**6**	**1.44**	**164**	**39.33**	**246**	**58.99**	**417**	**100.00**
B. Non Scientists	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**15**	**100.00**	**15**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Administrations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Media	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	0	0.00	0	0.00	0	0.00	15	100.00	15	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total (N)	**1**	**0.23**	**6**	**1.39**	**164**	**37.96**	**261**	**60.42**	**432**	**100.00**

Note: % = n/N; where n= frequency of victim. N = total number of victims

In international journals, most of the helpers of problems were categorized as "others" because it could not be classified under any particular category. Helpers of problems included under the category of "others" in many international journals referred to activities or efforts that could be conducted to reverse the original state of nature (nature engineering) which was originally the cause of forest fire, into something that was deterrent or resistant to forest fire, without mentioning the actors. An example was shown in the following statement:

> *"**Fire suppression and landscape fragmentation due to multiple land uses** have contributed to the reduction of fire frequencies."* (FEM Vol. 178: 62, 2003).

> *"**Active management to reduce the impact of fires and fire suppression actions** could be an important short-term conservation strategy."* (FEM Vol. 178: 219, 2003).

In addition to "others", "nature" was also widely regarded as helpers of problems of forest fires mentioned in international journals such as rain or natural forest with fire resistant vegetation composition. Quite often mentioned was the existence of certain types of fast growing post-fire vegetation species as helpers in the forest succession etc. Moreover, soil and climate conditions that could minimize the occurrence of forest fire were also discussed.

5.2.1.5 Solutions of Problem

Solutions of problems of forest fires in international journals could be classified into three categories, i.e. "economical", "social", and "ecological" solutions (**Table 5.39**).

Table 5.39. Solutions of Problem on Forest Fire Issues in International Journals

Speakers	Solutions of Problems							
	Economical		Social		Ecological		Sum	
	n	%	n	%	n	%	N	%
A. Scientists	**2**	**0.83**	**29**	**12.03**	**210**	**87.14**	**241**	**100.00**
B. Non Scientists	**0**	**0.00**	**0**	**0.00**	**3**	**100.00**	**3**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00
Administrations	0	0.00	0	0.00	0	0.00	0	0.00
Media	0	0.00	0	0.00	0	0.00	0	0.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	0	0.00	0	0.00	3	100.00	3	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00
Others	0	0.00	0	0.00	0	0.00	0	0.00
Total (N)	**2**	**0.82**	**29**	**11.89**	**213**	**87.30**	**244**	**100.00**

Note: % = n/N; where n= frequency of solution. N = total number of solutions

Based on the analysis of statements in international journals, most of the speakers referred to "ecological" as the solution of problems of forest fire. This ecological solution of problems was, in general, the results of the study on the possibility of forest areas to become resistant against forest fires, or at least minimize the mortality of forest stands due to fire regime that could not be avoided periodically as it occurred naturally. Research were also concerned with "ecological solution" in the form of treatments to accelerate the reversibility of burnt forest areas, the implementation of certain appropriate silvicultural systems, fuel treatments on potential fire protection behavior (FEM Vol. 105: 21-35, 1998) and the application of harvest selection and prescribed fires (FEM Vol. 138:263-271, 2000).

As the perspectives in global media, "social solution" was the second most mentioned solution of problems cited in many statements on forest fire issues in international journals, while "economic" solution was ranked last for solution of problems because it was hardly spoken of by the speakers in global media.

When viewed from the instruments used to overcome the problem, the instruments of solution of problems in international journals could be grouped into the following categories, i.e. "economical", "informational", "procedural", "regulative", "praxis", "planning", and "others" (**Table 5.40**).

In forest fire discourse, many speakers in international journals referred to "praxis" as the most widely used instruments as solution of problems. Some examples of "praxis instruments" mentioned in international journals were: applying appropriate silvicultural systems, applying appropriate harvesting system, and put out fire with water bomber as written in CJFR:

> *"... the decreasing fire frequency ... resulted from passive and active suppression...* ***Active suppression using water bomber tankers*** *began only around 1970." (CJFR Vol. 31:387, 2001).*

In addition to "praxis", instruments of solution of problems that were practically written in statements in international journals were "others", "planning instruments" and "regulative instrument ". "Others" category includes a variety of things that could not be classified into the categories of previous instruments, including various research on natural fire cycles, forest age distribution, stand composition, and other aspects that influence the intensity and frequency of forest fires (CJFR Vol. 31 : 384-391, 2001).

Table 5.40. Instruments of Solution of Problem on Forest Fire Issues in International Journals

Speakers	Instruments Solution of Problem															
	Economical		Informational		Procedural		Regulative		Praxis		Planning		Others		Sum	
	n	%	n	%	n	%	N	%	n	%	n	%	n	%	N	%
A. Scientists	**0**	**0.00**	**9**	**3.28**	**6**	**2.19**	**17**	**6.20**	**194**	**67.13**	**21**	**7.66**	**48**	**17.52**	**274**	**100.00**
B. Non Scientists	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**1**	**6.67**	**0**	**4.50**	**0**	**0.00**	**0**	**6.67**	**15**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Administrations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Media	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	0	0.00	0	0.00	0	0.00	1	6.67	13	86.67	0	0.00	1	6.67	15	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
TOTAL (N)	**0**	**0.00**	**9**	**3.11**	**6**	**2.08**	**18**	**6.23**	**207**	**71.63**	**21**	**7.27**	**48**	**16.96**	**289**	**100.00**

Note: % = n/N; where n= frequency of the respective instrument. N = total number of instruments of solution

Compared to the instruments of "economical", "informational", or "procedural", speakers in international journals spoke more on the "planning" and "regulative" as solutions of problems for forest fires. One use of "planning instrument" was to avoid fire, such as:

> *"...**strategic planning of harvesting activities** to estimate the desired proportion of even-aged, irregular, and uneven-aged stand types that can be recreated using different silvicultural treatments." (CJFR Vol. 31:389, 2001).*

In addition to "planning instrument", "regulative instrument" was also used as a solution to overcome the problems associated with forest fires. Regulations referred to, in general, were related to sustainable forest management, including regulation on silvicultural and harvesting systems. There was also a statement that emphasized the importance of international conventions, the Kyoto Protocol, in the regulation and control of afforestation, reforestation, and deforestation including those related to green house gases emissions and forest fires (CJFR Vol. 31:512, 2001).

5.2.1.6 Risk Evaluation

This section contained evaluation of future risks due to forest fire within the perspectives of international journals. The risks that may occur were grouped into five categories, namely: "risk occurrence probability", "loss of natural resources", "loss of human lives ", "loss of man-made material ", and "political relevance" (**Table 5.41**).

Table 5.41. Risk Evaluation on Forest Fire Issues in International Journals

Speakers	Risk Evaluations											
	Risk Occurrence Probability		Loss of Natural Resources		Loss of Human Lives		Loss of man-made material		Political Relevance		Sum	
	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**191**	**47.99**	**194**	**48.74**	**2**	**0.50**	**2**	**0.50**	**9**	**2.26**	**398**	**100.00**
B. Non Scientists	**2**	**15.38**	**8**	**61.54**	**1**	**7.69**	**0**	**0.00**	**2**	**15.38**	**13**	**100.00**
Politicians	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
Administrations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Media	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Organizations	2	16.67	7	58.33	1	8.33	0	0.00	2	16.67	12	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Total (N)	**193**	**46.96**	**202**	**49.15**	**3**	**0.73**	**2**	**0.49**	**11**	**2.68**	**411**	**100.00**

Note: % = n/N; where n= frequency of a respective risk evaluation. N = total number of speakers

Based on the evaluation of future risk of forest fire problems, as many as 193 speakers in international journals spoke of the possibility of returning the same problems ("risk occurrence probability"). Meanwhile, according to the orientation of most analyzed relevant forest fire articles in international journals that were ecology-oriented, "loss of natural resources" was more often mentioned as a future risk rather than "loss of human lives" and "loss of man-made materials". Following is an example of a statement in an international journal that contains a "risk occurrence probability".

> *"Climatic changes may be occurring simultaneously ... These changes have been parallel by **an increase in fire risk**."* (FEM Vol. 147: 26, 2001).

Discourse on forest fire in international journal was more a scientific matter; thus, future risks were considered not to have any political relevance although a number of speakers stated this in media discourse.

5.2.1.7 Frames

To view the perspectives of international journals, issues contained in the statements were evaluated according to the "problem definition", "causal interpretation", "impact evaluation", and "policy recommendations" referring to the approach by Semetko and Valkenburg (2000) as presented in **Table 5.42**. Generally, discourses in international journals viewed forest fire problems as having more relations to "environmental" rather than economic problems. Therefore, it could be said that with regard to the problem of forest fires, the international media frame were more inclined to environmental perspectives. In view of the causes of forest fires, international journals also tend to view forest fire incident as "the results of human activities". The influences of natural factors were not as great as human factors.

Evaluation of forest fire discourse in international journals showed that “forest fires were considered to be responsible for the occurrence of global climate change". The contrary opinions existed in a smaller proportion. In providing policy recommendations to prevent and combat forest fires, speakers in international journals mentioned enforcement of "national regulation" and "international convention" in a relatively balanced proportion. Within the perspectives of international journals, it seemed that it was not too important at which level policies were made, but what was more highlighted was the existence of technical regulations that could prevent and control forest fires.

Table 5.42. Frames of Forest Fire Discourse in International Journals

Speakers	Economy		Environment		Human Causes		Natural Causes		FF are responsible for GCC		FF are not responsible for GCC		International Conventions		National Regulations		Sum	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**3**	**7.69**	**9**	**23.08**	**11**	**28.21**	**4**	**10.26**	**6**	**15.38**	**4**	**10.26**	**1**	**2.56**	**1**	**2.56**	**39**	**100.00**
B. Non Scientists	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Administrations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Media	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Organizations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	100.00
Total (N)	**3**	**0.10**	**9**	**0.31**	**11**	**0.38**	**4**	**0.14**	**6**	**0.21**	**4**	**0.14**	**1**	**0.03**	**1**	**0.03**	**39**	**100.00**

Note: % = n/N; where n= frequency of a respective frames. N = total number of speakers

5.2.2 National Scientific Discourse on Forest Fire

The national scientific discourses on forest fire were evaluated from two national journals, i.e. *"Bulletin Penelitian Kehutanan"* published by Forestry Research and Development Agency (FORDA) and *"Jurnal Manajemen Hutan Tropika"* published by the Department of Forest Management, Bogor Agricultural University (IPB).

5.2.2.1 Distribution of Articles and Statements

The following **Table 5.43** shows the total number of articles and statements published in national journals. The number of forest fire articles in national journals was lower than that published in international journals due to the lower number of analyzed articles from national journals (two national journals) as compared to five international journals. This was due to the fact that it was difficult to find a national journal published regularly for the period of analysis (10 years).

Table 5.43. Number of Articles and Statements on Forest Fire in National Journals

Sources	Articles		Statements	
	n	%	n	%
Buletin Penelitian Kehutanan (BPK)	14	63.64	107	50.95
Jurnal Manajemen Hutan Tropika (JMHT)	8	36.36	103	49.05
Total (N)	**22**	**100.00**	**210**	**100.00**

Note: % = n/N; where n= number of article or statement, N= 22 (total number of articles), N= 210 (total number of statements)

"Bulletin Penelitian Hutan" (BPK) contained 14 articles and 107 statements on forest fire, while *"Jurnal Manajemen Hutan Tropika"* (JMHT) had 8 articles and 103 statements. This suggested that BPK contained almost two times the number of articles than JMHT. However, the number of statements regarding forest fire published in both journals showed similar figure.

5.2.2.2 Events

Forest fire discourse in national journals was classified into three categories: “positive”, “negative”, and “ambivalent” (**Table 5.44**).

Table 5.44. The Type and Valence of Event on Forest Fire Issues in National Journals

Valence & Scope of Events	Sources				Total	
	BPK		JMHT			
	n	%	n	%	N	%
A. Valence of Events (N)	**14**	**100.00**	**8**	**100.00**	**22**	**100.00**
Positive	0	0.00	1	12.50	1	4.55
Negative	0	0.00	0	0.00	0	0.00
Ambivalent	14	100.00	7	87.50	21	95.45
B. Scope of Events (N)	**14**	**100.00**	**8**	**100.00**	**22**	**100.00**
Global	1	7.14	2	25.00	3	13.64
Regional	0	0.00	0	0.00	0	0.00
National	5	35.72	5	62.50	10	45.45
Local	8	57.14	1	12.50	9	40.91

Note: % = n/N; where n= frequency of the respective valence or scope of event, N = total number of articles

More than 95% of articles on forest fire discourse in national journals had “ambivalent” valence. Therefore, similar to the scientific discourse on forest fire in international journals, generally the national journals discussed forest fire from a more balanced perspective, not just looking at “valence” of forest fire from one side of view. Based on the common writing format for journals, the authors wrote problems caused by forest fire and causing factors or factors supporting the occurrence of forest fire, which was the background for this research.

Subsequently, the authors presented the research results, which generally provided hope or solution to the problems raised related to forest fire, so that the valence of events became ambivalent because it contained a "negative" valence as well as a "positive" valence. Only one article had a "positive" valence: the article entitled "Detection of Post-Fire Forest Condition by Using multi-sensory Mos Messr and Landsat-TM: A case study in the area of Musi Persada Co. Forest. Ltd.., South Sumatra (JMHT Vol 6 No. 2: 55-70, 2000)

which signified that by using this technique, forest cover changes due to fire as well as land clearing were well recognized.

Based on the "scope of event", most articles on forest fire in national journals had a national scope of 45.45% and local scope of 40.91%. The interesting fact was that there were more than 13% of articles on forest fire that were published in national journals but had global scope of event. This indicated that the speakers at national level were not only concerned with national or local problems, but they were also connected with global issues.

Viewed from the "country of event", all articles published in national journals took place in middle-income countries, particularly Indonesia (**Table 5.45**).

Table 5.45. Countries of Event on Forest Fire Issues in National Journals

Countries	Sources				Sum	
	BPK		JMHT			
	n	%	n	%	n	%
High Income	0	0.00	0	0.00	0	0.00
Middle Income	**14**	**100.00**	**7**	**87.50**	**21**	**95.45**
Indonesia	14	100.00	6	75.00	20	90.91
Malaysia	0	0.00	1	12.50	1	4.55
Low Income	0	0.00	0	0.00	0	0.00
Not recognize	0	0.00	1	12.50	1	4.55
Total (N)	**14**	**100.00**	**8**	**100.00**	**22**	**100.00**

Note: % = n/N; where n= frequency of the respective field of authors, N = total number of articles

Although published in Indonesia, there was one article in JMHT which included location of event from forest fire that occurred outside Indonesia; namely, Malaysia.

5.2.2.3 Authors and Speakers

This section analyzed "field of science of authors" in national journals with the results shown in **Table 5.46**.

Table 5.46. Fields of Science of Authors on Forest Fire Issues in National Journals

Fields of Science	BPK		JMHT		Sum	
	n	%	n	%	n	%
Forest Science	13	92.86	8	100.00	21	95.45
Nature Conservation	0	0.00	0	0.00	0	0.00
Natural Science	1	7.14	0	0.00	1	4.55
Social Science	0	0.00	0	0.00	0	0.00
Other Science	0	0.00	0	0.00	0	0.00
Total (N)	**14**	**100.00**	**8**	**100.00**	**22**	**100.00**

Note: % = n/N; where n= frequency of the respective field of authors, N = total number of articles

In both national journals (BPK and JMHT), more than 95% of the field of authors of the forest fire articles was forest science and only 4.5% with natural science background. None of the authors of forest fires in national journals had backgrounds outside the field of science.

Country of origin of authors in the two national journals existed only in two countries, namely Indonesia and Thailand (**Table 5.47**).

Table 5.47. Country of Authors on Forest Fire Issues in National Journals

Countries of Authors	BPK		JMHT		Sum	
	n	%	n	%	n	%
High Income	0	0.00	0	0.00	0	0.00
Middle Income	**14**	**100.00**	**8**	**100..00**	**22**	**100.00**
Indonesia	14	100.00	7	87.50	21	95.45
Thailand	0	0.00	1	12.50	1	4.55
Low Income	0	0.00	0	0.00	0	0.00
Total (N)	**14**	**100.00**	**8**	**100.00**	**22**	**100.00**

Note: % = n/N; where n= frequency of the respective country of event, N = total number of articles

In line with the scope of readers that covered the national territory, almost all authors of articles on forest fire in the two national journals were from Indonesia, although there was one article in JMHT with an author from Thailand. As a scientific media, it is reasonable that the speakers in national

journals were dominated by scientists. More than 77% of speakers cited by BPK and JHT and about 23% were non-scientist's speakers with various backgrounds (**Table 5.48**).

Table 5.48. Speakers on Forest Fire Issues in National Journals

	BPK		JMHT		Sum	
	n	%	n	%	n	%
A. Scientists	**70**	**67.96**	**92**	**85.98**	**162**	**77.14**
a. Forest science	34	33.01	30	28.04	64	30.48
b. Non forest science	7	6.80	15	14.02	22	10.48
c. Not Recognizable	29	28.16	47	43.93	76	36.19
B. Non Scientists	**33**	**32.04**	**15**	**14.02**	**48**	**22.86**
Politicians	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
a. Politicians government	0	0.00	0	0.00	0	0.00
b. Politicians non government	0	0.00	0	0.00	0	0.00
Administration	**12**	**11.65**	**3**	**2.80**	**15**	**7.14**
a. Forest administration	12	11.65	3	2.80	15	7.14
b. Non forest administration	0	0.00	0	0.00	0	0.00
Media	**1**	0.97	**0**	0.00	**1**	0.48
NGOs	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**
a. Forest NGO	0	0.00	0	0.00	0	0.00
b. Non Forest NGO	0	0.00	0	0.00	0	0.00
Organizations	**1**	**0.97**	**4**	**3.74**	**5**	**2.38**
a. Forest organization	0	0.00	1	0.93	1	0.48
b. Non forest organization	1	0.97	3	2.80	4	1.90
Enterprises	**1**	**0.97**	**1**	**0.93**	**2**	**0.95**
a. Forest enterprises	1	0.97	1	0.93	2	0.95
b. Non forest enterprises	0	0.00	0	0.00	0	0.00
Not Recognizable (others)	18	17.48	7	6.54	25	11.90
Total (N)	**103**	**100.00**	**107**	**100.00**	**210**	**100.00**

Note: % = n/N; where n= frequency of speakers. N = total number of statements

Beside scientists, there were 15 speakers representing "forest administrations" and there were also speakers from organizations, enterprises and media albeit only slightly. As many as 25 speakers were coded as "others", including a single person or community, expert, consultant, or anonymous, which were not included in previous categories. The number of non-scientist's speakers at national journal was higher with more diverse backgrounds ("administration", "medium", "organizations", "enterprises", and "others") than that in international journal which was dominated by "organizations".

5.2.2.4 Interest Positions

Borrowing the approach by von Prittwitz (1990), there were three categories of "interest positions": causers, victims or helpers which were analyzed from the speakers' views on the issue of forest fire in national journals.

5.2.2.4.1 Causers

Totally, there were 111 "causers of the problem" mentioned by speakers in national journals covering the category of "causers" as "administrations", "enterprises", "society", "nature", and "others". Scientist's speakers dominate the discourse on "causers of problems" in national journals. However, unlike the non-scientist's speakers in international journal where many came from "organizations", non-scientist's speakers pointed out that the causer in national journal was "administrations" (**Table 5.49**).

In national journals, most of the "causers of problem" of forest fire could not be grouped in the existing categories; hence, they were classified under the category of "others". From 102 causers assigned by scientists, 70 of them were categorized as "others". In total, almost 70% of causers mentioned by all speakers also referred to this particular category. Included in the category of "others" were a single person or community, or chemical reaction element or content of soil composition, and others by human activities that could not be grouped in the previous categories, as shown by the statement below:

"Perpetrators *of industrial forest fire occurrence have never been investigated thoroughly." (BPK, Vol. 10 (1): 41-60, 1994).*

Table 5.49. Causers of Problem on Forest Fire Issues in National Journals

Speakers	Adminis-trations		Enter-prises		Society		Others		Nature		Sum	
	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**1**	**0.98**	**2**	**1.96**	**1**	**0.98**	**70**	**68.63**	**28**	**27.45**	**102**	**100.00**
B. Non Scientists	**0**	**0.00**	**1**	**11.11**	**0**	**0.00**	**7**	**77.78**	**1**	**11.11**	**9**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
Administrations	0	0.00	0	0.00	0	0.00	5	83.33	1	16.67	**6**	**100.00**
Media	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	**1**	**100.00**
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
Organizations	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	**1**	**100.00**
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
Others	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	**1**	**100.00**
Total (N)	**1**	**0.90**	**3**	**2.70**	**1**	**0.90**	**77**	**69.37**	**29**	**26.13**	**111**	**100.00**

Note: % = n/N; where n= frequency of the respective causer, N = total number of causers

In the statement above, the term "actor" referred to a single person who did not represent a particular category thus categorized as "others". Other causer of problems categorized as "others" were human activities that could not be included as a category of "causer", such as the activity of "burning the remaining harvest" or "land clearing" as follows:

*"... **burning of the remaining harvest** resulted in air pollution, and if not controlled can burn the forest." (BPK, 600: 27-38, 1996).*

*"... such area include fire **caused by land clearing**." (JMHT, vol. 6 no. 2:55-70, 2000).*

Other causer of problems that was also widely discussed in national journals was "nature", i.e. as much as 26% of the total causers presented by the speakers. Apart from both categories, "enterprises", "administration", and "society" were three causers of problems mentioned in national journals, although in a very small number. In addition to identifying "causers of

problems", this section also carried out evaluations on the "causes of the problem", which were divided into five categories: accidental causes, inadvertent causes, mechanical causes, Intentional causes, and others (**Table 5.50**).

Table 5.50. Causes of Problem on Forest Fire Issues in National Journals

Speakers	Causes of Problem											
	Accidental Causes		Inadvertent Causes		Mechanical Causes		Intentional Causes		Others		Sum	
	n	%	n	%	N	%	n	%	N	%	N	%
A. Scientists	**21**	**20.59**	**14**	**13.73**	**0**	**0.00**	**6**	**5.88**	**61**	**91.80**	**102**	**100.00**
B. Non-Scientists	**1**	**11.11**	**0**	**0.00**	**0**	**0.00**	**1**	**11.11**	**7**	**77.78**	**9**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Administrations	1	16.67	0	0.00	0	0.00	0	0.00	5	83.33	6	100.00
Media	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	1	100.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	1	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Others	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	1	100.00
Total (N)	**22**	**19.82**	**14**	**12.61**	**0**	**0.00**	**7**	**6.31**	**68**	**61.26**	**111**	**100.00**

Note: % = n/N; where n= frequency of cause, N = total number of causes

In national journals, the category of "others" was the most mentioned “causes of the problem" of forest fire. Causes of problems included in the category of "others" in national journals were: lack of skills and number of forest rangers, lack of infrastructure and facilities and budget for forest fire prevention, weak law enforcement against perpetrators of forest fires, population growth, fire spread and smoke which exacerbate the problems related to forest fire, forest fire and actors that could not be categorized as a certain cause category.

Following the category of "others", the next mentioned largest causes of problems in national journals were "accidental causes" and "inadvertent causes". Almost 20% of the causes of problems of forest fire in national journals referred to "accidental causes" such as El Nino, long-season drought, low

rainfall, and others. "Inadvertent causes" referred to human negligence such as human activities in looking for honey, the use fire to drive wild animals to a certain place in wildlife hunting.

5.2.2.4.2 Victims

Based on the evaluation of statements about the forest fire in national journals, there were several categories of victims of problems, namely "enterprises", "society", "nature", and "others" mentioned by the speakers (**Table 5.51**).

Table 5.51. Victims of Problem on Forest Fire Issues in National Journals

Speakers	Enterprises		Society		Others		Nature		Sum	
	n	%	n	%	n	%	n	%	N	%
A. Scientists	**2**	**1.90**	**1**	**0.95**	**43**	**40.95**	**59**	**56.19**	**105**	**100.00**
B. Non-Scientists	**1**	**7.69**	**0**	**0.00**	**1**	**0.85**	**11**	**8.62**	**13**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	**0**	0.00
Administrations	1	14.29	0	0.00	0	0.00	6	85.71	**7**	100.00
Media	0	0.00	0	0.00	0	0.00	1	100.00	**1**	100.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	**0**	0.00
Organizations	0	0.00	0	0.00	1	0.85	2	66.67	**3**	100.00
Enterprises	0	0.00	0	0.00	0	0.00	1	100.00	**1**	100.00
Others	0	0.00	0	0.00	0	0.00	1	100.00	**1**	100.00
Total (N)	**3**	**2.54**	**1**	**0.85**	**44**	**37.29**	**70**	**59.32**	**118**	**100.00**

Note: % = n/N; where n= frequency of victim, N = total number of victims

Most of the speakers in national journals considered "nature" as the victims of problems of forest fire, reaching 60% of victims. These were indicated by the following statements such as forests, vegetation, wildlife, environment, top soil in the burnt forest area.

> *"The fire struck a **5 hectares of forest area...** one type of vegetation that got burnt is the shrubs." (BPH, 590: 5, 1995).*

Besides "nature", speakers at national journals also mentioned diverse victims of problem of forest fire, which were grouped into the category of "others", such

as chemical elements and minerals contained in soil, soil pH, transportation sector, agriculture and trade, etc. Single person and communities were also included in the category of "others", for example the socio-economic conditions of society which was disrupted by the occurrence of forest fires.

5.2.2.4.3 Helpers

Helpers of problems of forest fires as forwarded by speakers at national journals could be classified into the category of "administrations", "enterprises", "organizations", "society", "nature", and "others" (**Table 5.52**).

Table 5.52. Helpers of Problem on Forest Fire Issues in National Journals

Speakers	Adminis-trations		Enter-prises		Organiza-tions		Society		Nature		Others		Sum	
	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**2**	**4.55**	**1**	**2.27**	**2**	**4.55**	**1**	**2.27**	**5**	**11.36**	**33**	**75.00**	**44**	**100.00**
B. Non-Scientists	**1**	**11.11**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**8**	**88.89**	**9**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
Administrations	1	14.29	0	0.00	0	0.00	0	0.00	0	0.00	6	85.71	**7**	**100.00**
Media	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
Organizations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	2	100.00	**2**	**100.00**
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	**0**	**0.00**
Total (N)	**3**	**5.66**	**1**	**1.89**	**2**	**3.77**	**1**	**1.89**	**5**	**9.43**	**41**	**77.36**	**53**	**100.00**

Note: % = n/N; where n= frequency of the respective helper, N = total number of helpers

More than 77% of the helpers of problems existed in national journals were categorized as "others", including the efforts of preventing and controlling forest fires that could be performed based on research results. One of the helpers of problems included under the category of "others" was a comprehensive research and knowledge related to forest fire, especially for peat swamp forest since most of the forest fires in Indonesia occurred in peat swamp forest. In addition, it was stated that improvement of the forest community's welfare and the economy would reduce the intensity of burning in land clearance, and zero burning method for land preparation. Salvage felling of dead trees in the ex-

burnt areas prevented the recurrence of fire because dead trees are potential fuels for forest fire occurrence.

In addition to "others", about 10% of the helpers of problems on forest fire mentioned in national journals were "nature". Included as a helper of the problems under the category of "nature", rain was the most frequently mentioned. In addition to rainfall, topography with steep slope, composition of particular vegetation types, certain climatic conditions to minimize the spread of forest fire to prevent widespread of fires (ini belum ada verb nya Bu. Meanwhile, wind direction like double-edged knife, could trigger the spread of fire (causers) and could also led to localize fire to prevent widespread of the burned area (helpers).

5.2.2.5 Solutions of Problem

As in international journals, solutions of problem of forest fire in national journals could be classified into three categories: "economical", "social", and "ecological solutions" (**Table 5.53**).

"Ecological" was the solution of problems raised by most speakers in national journals, with more than 56%. Some of the things in national journals referred as "ecological solution" included: regulating vegetation composition, especially the conditions of undergrowth that could minimize the danger of forest fires or the making of fire breaks in the form of fire-resistant vegetation. Another solution was research on forest areas that often experienced fire such as *Imperata cylindrica* areas and peat forests to obtain an idea about the effects of *Imperata cylindrica* ecosystem and method of *Imperata cylindrica* management suitable for forest fire prevention and control (BPK, 595: 19-30, 1995).

Table 5.53. Solutions of Problem on Forest Fire Issues in National Journals

Speakers	Solutions of Problems							
	Economic		Social		Ecological		Total	
	n	%	n	%	n	%	N	%
A. Scientists	**8**	**38.10**	**5**	**23.81**	**8**	**38.10**	**21**	**100.00**
B. Non Scientists	**0**	**0.00**	**0**	**0.00**	**9**	**30.00**	**9**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00
Administrations	0	0.00	0	0.00	7	23.33	7	100.00
Media	0	0.00	0	0.00	0	0.00	0	0.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	0	0.00	0	0.00	2	6.67	2	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00
Others	0	0.00	0	0.00	0	0.00	0	0.00
Total	**8**	**26.67**	**5**	**16.67**	**17**	**56.67**	**30**	**100.00**

Note: % = n/N; where n= frequency of solution, N = total number of solutions

Following "ecological solution", "economic solution" was the second most mentioned solution of problems in national journals referred to by speakers. Nearly 27% of the solutions of problems in national media were associated with economic aspects and only about 16% which could be categorized as "social solution".

The “instrument” to handle the problems caused by forest fires mentioned in national journals could be grouped into the categories of: “economical”, “procedural”, “regulative”, “praxis”, “planning”, and “others” (**Table 5.54**).

Table 5.54. Instruments of Solution of Problems on Forest Fire Issues in National Journals

Speakers	Econo-mical		Proce-dural		Regu-lative		Praxis		Planning		Others		Sum	
	n	%	n	%	n	%	n	%	n	%	n	%	N	%
A. Scientists	**2**	**4.00**	**1**	**2.00**	**6**	**12.00**	**32**	**64.00**	**2**	**4.00**	**9**	**18.00**	**50**	**100.00**
B. Non Scientists	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**6**	**75.00**	**0**	**0.00**	**2**	**25.00**	**8**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Administrations	0	0.00	0	0.00	0	0.00	6	85.71	0	0.00	1	14.29	7	100.00
Media	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	1	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Others	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total (N)	**2**	**3.45**	**1**	**1.72**	**6**	**10.34**	**38**	**65.52**	**2**	**3.45**	**11**	**18.97**	**58**	**100.00**

Note: % = n/N; where n= frequency of the respective instrument. N = total number of instruments of solution

As in international journals, many speakers in national journals also stated “praxis" as the most widely used instruments to overcome the problems associated with forest fires, such as performing controlled burning or application of zero burning in land preparation activities as well as establishing fire breaks.

Instruments of solution of problems of forest fires that were practically written in the statements in national journals were "others" and "regulative instrument”. There were about 19% of the solutions of problems raised by the speakers in national journals included in the category of "others". Meanwhile, there were about 10% of the instruments of solution referred to by speakers in national journals as "regulative instrument", such as processing forest fire events to completion and imposed legal sanctions to guilty perpetrators.

5.2.2.6 Risk Evaluation

Evaluation of future risks that might occur due to forest fire in the perspective of national journals could be grouped into the category of "risk occurrence

probability", "loss of natural resources, " "loss of human lives, " "loss of man-made material" , and "political relevance" (**Table 5.55**).

Table 5.55. Risk Evaluation on Forest Fires in National Journals

Speakers	Risk Evaluations											
	Risk Occurrence Probability		Loss of Natural Resources		Loss of Human Lives		Loss of man-made material		Political Relevance		Sum	
	n	%	n	%	N	%	n	%	n	%	N	%
A. Scientists	**69**	**68.32**	**22**	**21.78**	**1**	**0.99**	**6**	**5.94**	**3**	**2.97**	**101**	**100.00**
B. Non-Scientists	**11**	**73.33**	**3**	**20.00**	**0**	**0.00**	**0**	**0.00**	**1**	**6.67**	**15**	100.00
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Administrations	8	72.73	3	27.27	0	0.00	0	0.00	0	0.00	11	100.00
Media	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00	2	100.00
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Organizations	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Others	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
Total (N)	**80**	**68.97**	**25**	**21.55**	**1**	**0.86**	**6**	**5.17**	**4**	**3.45**	**116**	**100.00**

Note: % = n/N; where n= frequency of a respective risk evaluation, N = total number of speakers

In contrast to international journals, "occurrence probability" of future forest fires in national journal was far more often mentioned by the speakers. The "loss of natural resources" were more spoken of by speakers in national journals rather than the "loss of man-made material" and "human life", the same for international journals. Some of the research and publications related to forest fire in both national journals indicated that the journals were more ecological-oriented rather than socio-economic-oriented. This was also reflected by the low number of speakers who stated that the risk of forest fires had “political relevance", although based on facts it had been described in the previous chapter on media discourse that in 2007 a great fire occurred in Kalimantan, Indonesia which impacted the neighbouring countries and attracted many international attentions.

5.2.2.7 Frames

Frames of forest fire discourse in national journals were evaluated based on "problem definition", "causal interpretation", "impact evaluation", and "policy recommendation" (**Table 5.56**).

Speakers in national journals generally viewed forest fire problems as "environmental" rather than "economical" problems. Regarding the causes of forest fires, speakers cited in national journals tend to view forest fire occurrence as the results of human activities. Although natural factors also occurred, however they believed that human factors were major causes of forest fires. Human activities were mentioned by many in national journals as a cause of forest fires.

Similar to frame in international journals, evaluation of forest fire discourse in national journals showed that forest fire was considered to be responsible for the global climate change.

Formulating better national regulations was believed by many speakers in national journal as a more trusted recommendation in preventing and controlling forest fires, while the recommendation of the importance of international convention on forest fires was only voiced by one speaker.

Table 5.56. Frames of Forest Fire Discourse in National Journals

Speakers	Problem's definition				Causal interpretation				Impact evaluation				Policy recommendation				Sum	
	Economy		Environment		Human Causes		Natural Causes		FF are responsible for GCC		FF are not resposible for GCC		International Conventions		National Regulations			
	n	%	n	%	n	%	n	%	N	%	n	%	n	%	n	%	N	%
A. Scientists	**2**	**4.00**	**6**	**12.00**	**21**	**42.00**	**11**	**22.00**	**1**	**2.00**	**0**	**0.00**	**1**	**2.00**	**8**	**16.00**	**50**	**100.00**
B. Non Scientists	**0**	**0.00**	**1**	**20.00**	**1**	**20.00**	**3**	**60.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**0**	**0.00**	**5**	**100.00**
Politicians	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	**100.00**
Administrations	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	**100.00**
Media	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	1	**100.00**
NGOs	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	**100.00**
Organizations	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	**100.00**
Enterprises	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	**100.00**
Others	0	0.00	1	33.33	0	0.00	2	66.67	0	0.00	0	0.00	0	0.00	0	0.00	3	**100.00**
Total	**2**	**3.64**	**7**	**12.73**	**22**	**40.00**	**14**	**25.45**	**1**	**1.82**	**0**	**0.00**	**1**	**1.82**	**8**	**14.55**	**55**	**100.00**

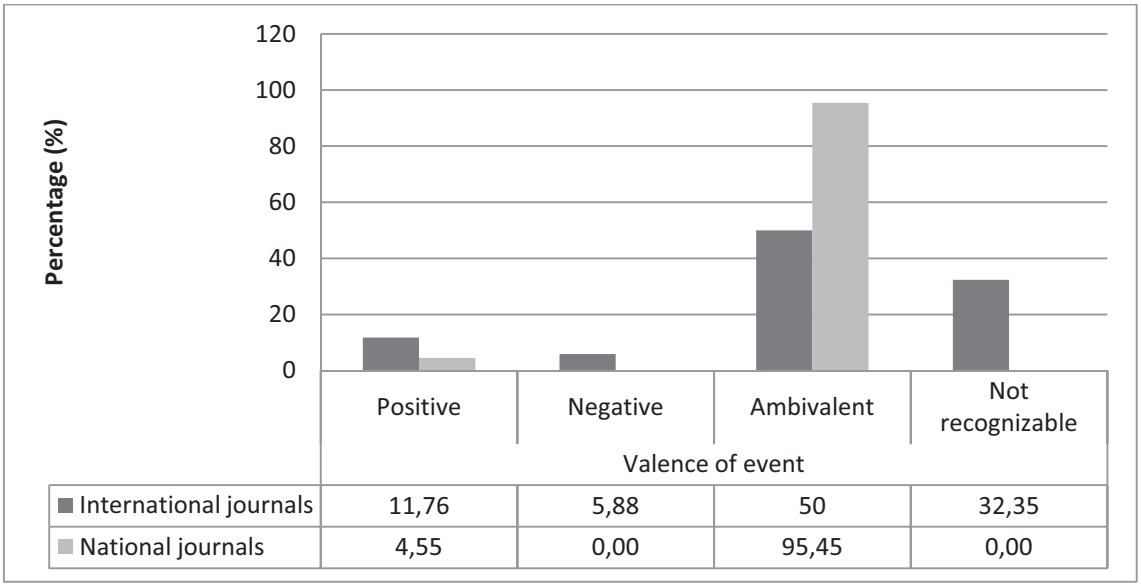
Note: % = n/N; where n= frequency of a respective frames, N = total number of speakers

5.2.3 Discussion: Comparison Between International and National Journals

This section compared the "perspectives of scientific media towards forest fire", “knowledge on utilization of forest science", “hegemony of economic power on scientific discourse", “interest positions", and “framing" of scientific discourse on forest fire in international and national journals.

5.2.3.1 Perspectives of Scientific Media toward Forest Fire

International and national journals had similar "valence" on forest fire. Ninety-five percent (95%) of national journals containing articles on forest fire had "ambivalent" valence. Similarly, about half of the articles on forest fire in international journals also had "ambivalent" valences (**Figure 5.12**).



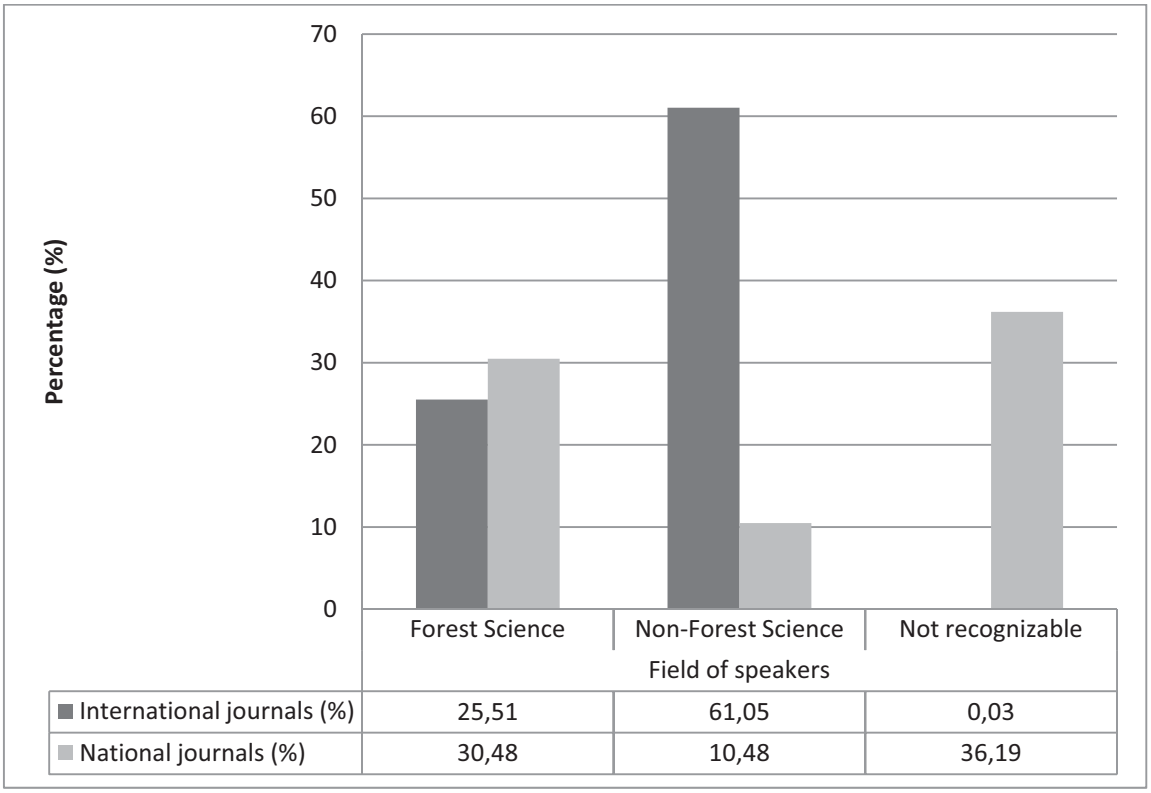
	Positive	Negative	Ambivalent	Not recognizable
International journals	11,76	5,88	50	32,35
National journals	4,55	0,00	95,45	0,00

Figure 5.12. Valence of Events of Forest Fires in Scientific Media

Although in general international and national journals had the same perspectives in viewing forest fire in a balanced positive and negative ("ambivalent") perspective, if seen from the distribution of "valence" of each respective journal, it could be said that national journals actually had a more neutral view with respect to forest fire, meaning that an article on forest fire in national journals would always illustrate both the problem and efforts to combat forest fires.

5.2.3.2 Roles of Forest Science in the Scientific Discourse on Forest Fires

In international journals, more than 61% of the referred scientists on forest fire had non-forest science backgrounds, while in national journals most of the referred scientists had unrecognizable background. However, from a number of scientists with recognized background, it was identified that national journals considered more opinions from forestry scientists as compared to non-forest scientists within the scientific discourse on forest fires (**Figure 5.13**).



	Forest Science	Non-Forest Science	Not recognizable
International journals (%)	25,51	61,05	0,03
National journals (%)	30,48	10,48	36,19

Figure 5.13. Fields of Science of Speakers in Scientific Media

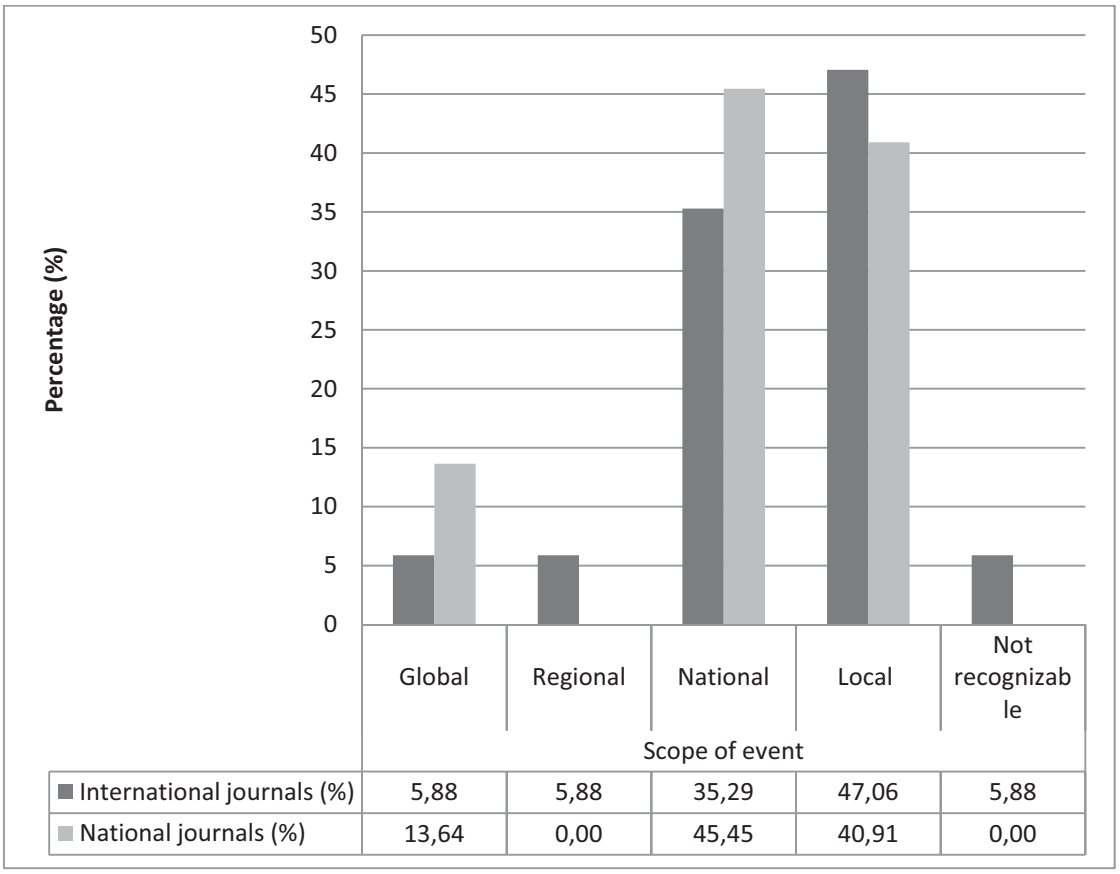
The great proportion of speakers with forest sciences backgrounds in national forest science journals suggested that forest fire discourse in national journals was considered closer to the forestry science dimensions than to other sciences. Unlike in national journals, forest fire discourses in international journals were more dominated by issues outside the field of forestry science.

Therefore, it can be said that the role of forest science in forest fire issue was more prominent in scientific discourse at national rather than international level. Within the international scientific discursive areas, forest fires were not merely

seen from forestry issues but were approached by an interdisciplinary approach.

5.2.3.3 Hegemony of High-Income Countries on Scientific Discourse

In the scientific discourse, forest fires apparently still not viewed as a global problem. Based on the scope of events, both international and national journals were more concerned with forest fire issues within the scope of national and local levels rather than that of global (**Figure 5.14**).



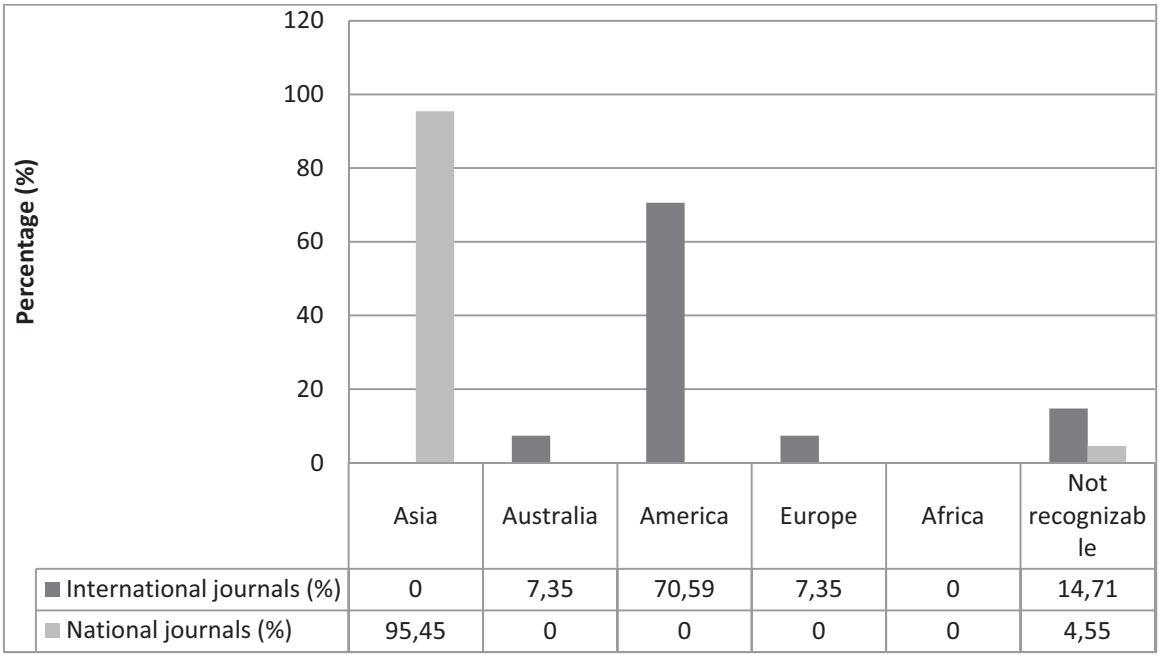
	Global	Regional	National	Local	Not recognizable
International journals (%)	5,88	5,88	35,29	47,06	5,88
National journals (%)	13,64	0,00	45,45	40,91	0,00

Figure 5.14. Scope of Events in International and National Journals

Although having global readers, forest fire discourse in international journals with a global scope of events covered only 5.88% out of all the total articles on forest fires. This showed that the journals' concerns on forest fire discourse with global scope of event were very low, even lower than the national journals. National journals contained about 13.6% articles that discussed forest fire discourse with global scope of events.

Instead of emphasizing forest fire discourse with global scope of event, more than 80% of articles published in international journals had national and local scopes of events. This figure was rather similar to the scope of the event of forest fire discourse in national journals.

Likewise, if viewed by locations of events by continents, most of the articles written on forest fires published in international journals took place in America where the journals were published (**Figure 5.15**).



	Asia	Australia	America	Europe	Africa	Not recognizable
International journals (%)	0	7,35	70,59	7,35	0	14,71
National journals (%)	95,45	0	0	0	0	4,55

Figure 5.15. Locations of Forest Fire Events by Continents in Scientific Media

More than 70% of the articles on forest fire in international journals had the location of event in America, about 7% in Europe and 7% in Australia. It should be highlighted that not a single article on forest fire published in international journals within the past decade (1994-2003) that had the location of event in Asia. Yet, during such a time period, several severe forest fires occurred in Asia, especially in Indonesia.

It is reasonable when the national journals referred to Asian continent as having the most frequent issues of forest fire, since high intensity of forest fire occurred in Asia, particularly in Indonesia and because the scope of readers were only at national level. The simplest argument for the asymmetric information on forest fire issues in international journals was the imbalance distributions of the country of origin of the authors (**Figure 5.16**).

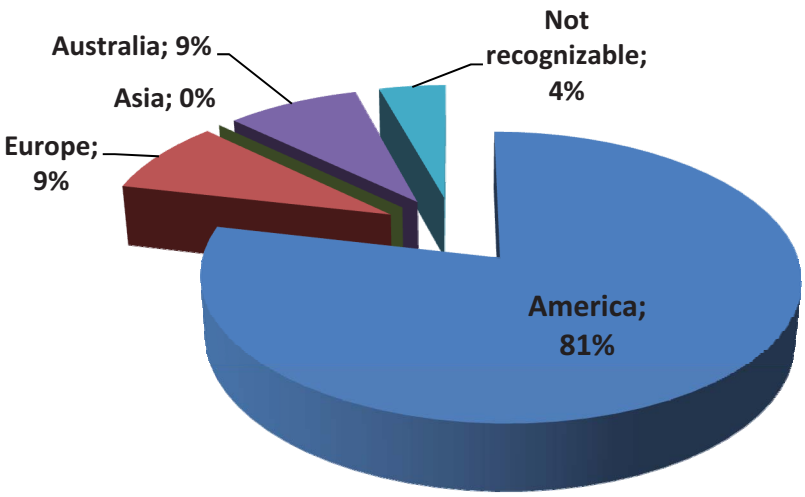


Figure 5.16. Origins of Authors by Continents

In total, more than 81% of articles on forest fire in respective international journals were written by authors from the continent of America, followed by Australia with 9%, Europe 9%, and unrecognized 4%. None of the authors originated from Asia.

Very significant differences between international and national journals could also be seen from the country's economic backgrounds of the authors (**Figure 5.17**).

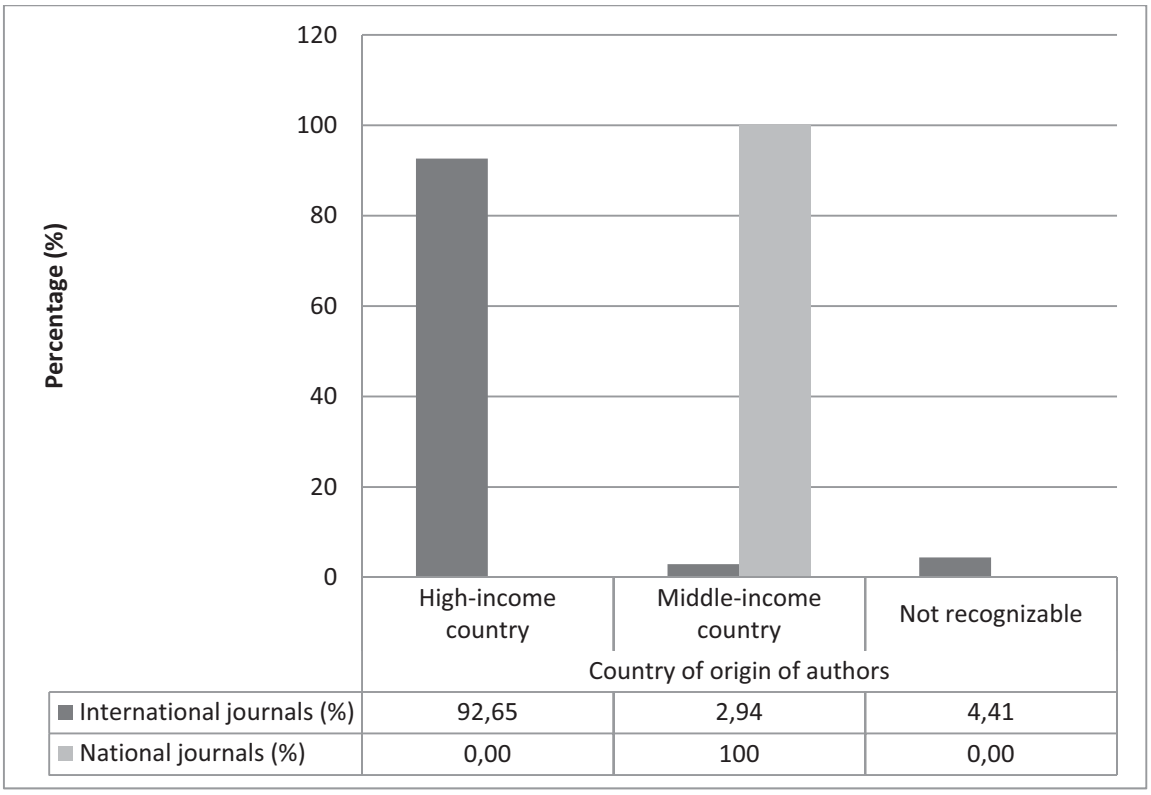


Figure 5.17. Countries of Origin of Authors in International and National Journals

More than 92% of forest fire articles in international journals were written by authors from high-income countries, while in national journals, less than 3% of all of the articles were written by authors from middle-income. Authors from high-income countries in international journals were dominated by North American authors, especially the U.S. and Canada. The significant background differences of the "origin of authors" could result in different perspectives of forest fires in scientific discourses between international and national journals.

Some argued that the reason for the dominance of authors from developed countries, particularly USA, was the fact that these international journals were published in North America and written mostly by American authors. However, since these journals have been recognized as international journals, forest fire incidents in other countries should have been acknowledged as they are the forum for international scientific discourse on forests. Therefore, the locations of issues should cover a wider-range of continents and wider-spread of authors' country of origin rather than covering only high-income countries.

5.2.3.4 Interest positions

Most of the speakers in both international and national journals, viewed "others" and "nature" as the major causers of forest fire problems. Moreover, both international and national journals also viewed "society" as one of the causers of forest fire problems. In such cases, the difference was the position of "enterprises" and "administrations" in international and national journals. Several speakers in national journals assumed that the position of "enterprises" and "administration" was the causers of forest fire problems, while this was not mentioned in international journals. This implied that in several national journals' articles, "enterprises" and "administration" tend to receive a "negative image", which was not found in international journals.

Based on the "causes of problems", most speakers in international and national journals mentioned "others" as the main cause of forest fire. Another cause of forest fire that was often mentioned in international and national journals was "accidental causes", which were caused by human carelessness, such as fires sparked from the embers of a forgotten bonfire which had not been extinguished or a person's omission who discarded used matches that were still burning on top of dry litters.

As much as 97% of "victims of problem" of forest fire mentioned by speakers in international journals referred to "nature". Only half of the speakers in national journals provided similar thoughts, and the other half referred to "others", "enterprises", and "society" as victims of problems of forest fires.

For "helpers of problem", both international and national journals claimed "others" and "nature" as the main helpers of problems of forest fire. The high number of helpers who were considered as "others" showed the diversity of speakers' opinions on whom or what things were considered helpful in tackling forest fire problems. Similarly, "enterprises" were seen as helpers in both international and national journals, although mentioned only by a few speakers.

Nevertheless, there were some differences in perspectives between international and national journals in relation to "administration", "organizations" and "scientists" as helpers. In national journals, several speakers mentioned the

roles of "administration" and "organizations" as helpers, which were not mentioned in international journals. Conversely, there was a speaker in international journal who mentioned the role of scientists as helpers, and this was not found in national journals.

5.2.3.5 Frames

In forest fire discourse, there were similarities of frame between international and national journals. Both considered forest fire as being closer to environmental issues rather than economic. Both journals similarly interpreted "human causes" as the most responsible factor for forest fires.

In contrast to the discourses in global and national (news) media, in scientific discourses on forest fire, both international and national journals had similar positions against the impacts of global forest fire on the climate change. Although not many, several articles in international and national journals mentioned that forest fires were responsible for global climate change.

For policy recommendation, both international and national journals equally emphasized the importance of "national regulations" in preventing and overcoming forest fires. There were no statements found in international and national journals that recommended the need for "international convention" for forest fires.

5.3 Stakeholder's Perceptions on Forest Fires

This sub-chapter discusses about stakeholders' perception towards forestry issues particularly forest fires. Discussion would be divided into seven topics, i.e. perceptions of stakeholders towards: 1) "level of importance of forestry issues", 2) "media and policy agenda-setting", 3) "actors perceived positive and negative images from forestry issues", 4) "causes of forest fires in Indonesia", 5) "solutions of problems", 6) "the role of forest fire towards global climate change", and 7) "frames of forest fire issues".

5.3.1 Levels of Importance of Forestry Issues

Forest fire is one of several important forestry issues in Indonesia, apart from illegal logging, flooding and landslides, forest encroachment, forests rehabilitation, carbon trading, community forestry, etc. This part discussed stakeholders' perceptions of the level of importance of these issues. To explore stakeholder's perceptions of the importance of forestry issues, interviews were conducted with 40 respondents who represented stakeholders at international, regional, national, and local (provincial) organizations. In these interviews, respondents were asked to answer questions, on which forestry issues was regarded as the most important; thus, it should become public concerns.[1]

Descriptions of the stakeholders' perceptions of the importance of forestry issues in Indonesia at the international and regional levels were obtained from interviews with several institutions, namely: Centre for International Forestry Research (CIFOR), Southeast Asia Regional Centre for Tropical Biology (SEAMEO-BIOTROP), ASEAN-Korea Environmental Cooperation (AKECOP), and Association of Southeast Asian Nations (ASEAN) Secretariat.

SEAMEO-BIOTROP, AKECOP and the ASEAN Secretariat were chosen because they represented organizations at regional level that touched many aspects of ecological, social, and economic impacts of forest fires in Southeast Asia. Stakeholders' interviews were mostly done on a regional

[1] The perception here represented personal views of individual respondents who were considered to know about the problems of forest fire in Indonesia and did not represent the official views of organization.

level organization (ASEAN) because the scopes of impacts of forest fire were more on national and regional levels. Meanwhile, since not many international organizations in Indonesia concerned themselves with forest fire problems, in doing sampling for international organizations, only one organization was selected, i.e., CIFOR as it was considered to have high enough attention to various researches related to forest fire issues.

At national level, stakeholders' perceptions of the importance of forestry issues were obtained from several institutions, i.e. DG of Forest Planning (BAPLAN), DG of Forest Protection and Nature Conservation (PHKA), DG of Forest Utilisation (BPK), DG of Land Rehabilitation & Social Forestry (RLPS), Forestry Research and Development Agency (FORDA), Centre for Information & Public Affairs of the Ministry of Forestry (HUMAS DEPHUT), national university (IPB), national NGO (LATIN), and forest companies (ENTERPRISES), as tabulated in **Table 5.57**.

Table 5.57. Levels of Importance of Forestry Issues in Indonesia According to Stakeholders at the International, Regional, and National Organizations.

Stakeholders	Levels of Importance					
	Forest Fire	Illegal Logging	Flood & Land-slide	Encro-achment	Rehabi-litation	Others
INTERNATIONAL & REGIONAL	**2**	**1**	**3**	**4**	**5**	**6**
CIFOR	2	1	4	3	5	6
SEAMEO-BIOTROP	2	1	4	1	5	6
AKECOP	3	1	2	4	5	6
ASEAN	2	1	3	5	4	6
NATIONAL	**3**	**1**	**2**	**4**	**5**	**6**
BAPLAN	1	3	2	5	4	6
PHKA	3	1	2	5	4	6
RLPS	3	1	2	5	4	6
BPK	4	1	2	3	5	6
FORDA	4	3	2	1	6	5
HUMAS DEPHUT	4	1	3	5	2	6
IPB	1	2	3	4	5	6
LATIN	3	2	1	4	6	5
ENTERPRISES	3	1	2	4	5	6

Source: primary data (2009), Note: ranking are started from 1 (most important) to 6 (least important)

In general, stakeholders in international and regional organizations viewed “illegal logging” as the most important forestry issues in Indonesia. The second most important issue was "forest fire", followed by "floods and landslides", "forest encroachment", "forest rehabilitation" and last "others". Meanwhile, stakeholders in national organizations had diverse perceptions. Similar to stakeholders at international and regional levels, they generally viewed "illegal logging" as the most important forestry issues in Indonesia today and placed "forest fire" as the third most important issue after "illegal logging" and "floods and landslides".

Perceptions of stakeholders at the local level were obtained through interviews with stakeholders in seven provinces, which represented three different parts of Indonesian regions, namely: Riau, Bangka Belitung, West Java, and D.I. Yogyakarta (western region); East Kalimantan and Bali (central region) and North Sulawesi (eastern region). Respondents originated from stakeholders in various organizations and community groups, were: BAPPEDA (Regional Development Planning Board), BLHD (Regional Environmental Board), BP DAS (Watershed Management Board), DISHUT (Province Forestry Office), BPKH (Forest Area Arrangement Board), BKSDA (Nature Resource Conservation Board), *Perum Perhutani* (State-own Forest Enterprise), and the University (Faculty of Forestry University of Mulawarman). Respondents’ perceptions of the importance of forestry related issues at local level were determined from these interviews results (**Table 5.58**).

Referring to stakeholders’ perceptions in the Province of Riau, “forest fire” was the most important forestry issue to be considered. This was because there were many forest fire incidents in the Province of Riau and during the conduct of interview, forest fires were often occurred in several places within this province. In other provinces, forest fire was also important, although not a very pivotal issue. In general, “floods and landslides” were mostly perceived by stakeholders at local level as the most critical issue that gained public attention, followed by “illegal logging” and “forest fire”. Several respondents from the Provinces of Riau and East Kalimantan stated that “others” was the second most important problem in forestry sector.

Table 5.58. Levels of Importance of Forestry Related Issues According to Stakeholders at the Local Organizations.

Provinces & Stakeholders	Level of Importance					
	Forest Fire	Illegal Logging	Flood & Land-slide	Encro-achment	Rehabi-litation	Others
PERCEPTIONS OF LOCAL STAKEHOLDERS WESTERN REGIONS:						
RIAU	**1**	**2**	**3**	**4**	**6**	**5**
▪ BLHD	1	2	4	5	6	3
▪ BKSDA	1	4	3	5	6	2
▪ BAPPEDA	1	2	4	3	5	6
▪ DISHUT	1	3	2	4	5	6
BANGKA BELITUNG	**3**	**2**	**1**	**4**	**6**	**5**
▪ BPDAS	5	4	1	3	6	2
▪ BPKH	2	3	1	4	5	6
WEST JAVA	**5**	**3**	**2**	**1**	**4**	**6**
▪ DISHUT	4	6	3	1	5	2
▪ BAPPEDA	3	4	2	5	1	6
▪ BPDAS	4	1	2	3	5	6
▪ PERHUTANI-III	4	1	5	2	3	6
D.I. YOGYAKARTA	**3**	**2**	**1**	**5**	**4**	**6**
▪ BPDAS	3	2	1	5	4	6
▪ BKSDA	2	3	1	4	5	6
▪ BPKH	3	2	1	5	4	6
CENTRAL REGIONS:						
EAST KALIMANTAN	**3**	**2**	**1**	**4**	**6**	**5**
▪ BPKH	4	3	1	2	5	6
▪ BAPPEDA	4	2	1	3	5	6
▪ BKSDA	3	4	1	5	6	2
▪ UNMUL	3	2	1	4	5	6
BALI	**2**	**3**	**1**	**4**	**5**	**6**
▪ BPKH	2	3	1	4	5	6
▪ BKSDA	2	3	1	4	5	6
EASTERN REGIONS:						
NORTH SULAWESI	**5**	**1**	**3**	**2**	**4**	**6**
▪ BKSDA	5	2	3	1	4	6
▪ DISHUT	4	1	3	2	5	6
▪ BPDAS	4	2	3	5	1	6

Source: primary data (2009), Note: ranking are started from 1 (most important) to 6 (least important)

In the Province of Riau, the category of "others", considered important by stakeholders, was the problem of wildlife-human conflict where elephants disturbed community's gardens and fields due to over-population and disturbances of the elephant's habitat. In East Kalimantan, the category of "others" were considered by stakeholders as the most important issue in forestry sector, mainly because of the proliferation activity of opening forest areas for "mining", particularly coals.

In West Java, stakeholders perceived mostly on "forest encroachment" as the most important issues related to forest. The issue of "land rehabilitation" was still considered less important by most respondents, although very widely publicized by the government through a program of National Movement for Forest and Land Rehabilitation (GNRHL). Similarly, according to the stakeholders' perceptions, other issues such as "climate change" and "carbon trading" were still considered the elitist issues that were less grounded than the issues of illegal logging, floods, and wild fires which had more concrete impacts and directly felt by the public. "Community forestry" issue, although directly engage the community around forest, received less attention.

During the 2009 interviews, there were not much forest fires occurring, therefore, the majority of respondents considered the issues of "illegal logging" and "flooding" as more important than forest fires. Perceptions of respondents were likely to be different if the interviews were conducted in 1997/1998 in the event of larger and broader impacts of forest fires in Indonesia. It could be explained that the scope of the issue also affected the perceptions of respondents. "Floods and landslides" were local dimensional issues, hence the importance of these issues were felt more by respondents at the local level. Since the scope and impacts of forest fires went beyond national borders, the level of importance of these issues were considered higher on international and regional levels than national or local levels.

5.3.2 Stakeholders' Perceptions: Media and Policy Agenda-Setting

This section discussed stakeholders' perception towards media in influencing policy agenda setting. Most stakeholders perceived "administration" as the main reference of the news in media. Beside this, according to stakeholders' perception at international and regional organizations, "politicians" and "NGOs" were pointed out as important speakers. In a national scope, for issues pertaining to forestry, the media perceived more opinions of "NGOs" and "scientists" at the university rather than "politicians", whereas at local scale, "community leaders" and "NGOs" were quite often consulted by the media. Stakeholders perceived that the more frequent the coverage from a speaking actor in the media, the stronger its influence was in shaping or directing public opinion. In this matter, information from the "administration" was still quite dominant in driving public opinion in international and local media (**Table 5.59**).

Table 5.59. The Most Influencing Speaking Actors in Driving Public Opinion According to Stakeholders' Perceptions

Stakeholders	Level of Organizations		
	International & Regional	National	Local
Administrations	1	2	1
Scientists	5	3	4
Politicians	3	5	5
Community leaders	4	4	2
NGOs	2	1	3
Enterprises	6	6	6
Others	7	7	7

Source: primary data (2009), Note: ranking are started from 1 (most influencing) to 7 (least influencing)

Referring to stakeholders' perception, although news media was the source of information that mostly shaped public opinions on forestry issues, it was not the main reference for determining policy agenda-setting. The majority of

stakeholders at international and regional organizations perceived that policy agenda setting was mostly affected by "scientists" who were requested by the concerned institutions to provide advisories in response to certain issues (**Table 5.60**). These scientists, in line with arguments of Pielke (2006), who influenced to policy agenda-setting, were "scientist arbiters" and "honest brokers". However, "pure scientists", who wrote articles in scientific journals, were less influenced by policy agenda-setting.

Meanwhile, stakeholders at national and local organizations tend to argue that reports from "administrations" were the main references in determining the policy agenda-setting in their institutions, followed by input from a scientist. Based on stakeholders' perceptions, "news media" was the third referral source after administration's report and scientist's input in determining policy agenda setting.

Table 5.60. The Most Influencing Information to Policy Agenda-Setting According to Stakeholders' Perceptions

Stakeholders	Level of Organizations		
	International & Regional	National	Local
Administrations	2	**1**	**1**
Scientists	**1**	2	2
Journals	4	5	5
News media	3	3	3
Society	5	4	4
Others	6	6	6

Source: primary data (2009), Note: ranking are started from 1 (most influencing) to 6 (least influencing)

According to stakeholders' perceptions at international and regional levels, governments' policy-agenda tend to influence issues brought up in the media. The reverse was found at national and local levels, where most stakeholders perceived media issues as having influence on government's policy-agenda (**Table 5.61**).

Table 5.61. The Roles of Media in Policy Agenda-Setting According to Stakeholders' Perceptions

Perceptions	Stakeholders		
	International & Regional	National	Local
	%	%	%
Government's policy agenda influencing media issues.	**75.00**	33.33	45.83
Media issues influencing government's policy agenda.	25.00	**66.67**	**54.17**

Source: primary data, n=40 respondents

The previous **Table 5.61** indicates that most stakeholders perceived that forestry issues raised by the media influenced the policies adopted by governments at national and local levels. In contrast, policies issued by government greatly affected forest related issues at international level.

5.3.3 Whose Actors Perceived Positive and Negative Image from Forestry Issues?

According to the stakeholders' perceptions at international, regional, and national organizations, speaking actors who were considered as receiving the most "positive image" in the news media on forestry related issues, including forest fires, was "NGOs" followed by "administrations", while at local level, it was "administrations" followed by "community leaders". NGOs were thought to received "positive image" related to forest fires because they were often involved as volunteers in fire fighting and made great efforts to help residents in the event of forest fires (**Table 5.62**).

Table 5.62. Ranking of "Positive Image" of Speaking Actors Related to Forest Fire Issues According to Stakeholders' Perceptions

Stakeholders	Levels of Organizations		
	International & Regional	National	Local
Administrations	2	2	1
Scientists	4	5	5
Politicians	3	4	4
Community leaders	5	3	2
NGOs	1	1	3
Enterprises	6	6	6
Others	7	7	7

Source: primary data (2009), Note: ranking are started from 1 (most positive) to 7 (least positive)

The "administrations", however, had a quite unique position in stakeholders' perceptions. On one hand, they were often regarded as the party that received "positive image" in relation to handling various problems on forestry related issues ("helpers"). On the other hand, if there were problems relating to forestry, the "administrations" were often blamed as the most "causers of problems", thus obtained "negative image" from the stakeholders. Besides the "administrations", the party which was also often bear the "negative image" of the problems of forestry related issues according to stakeholders' perceptions was "enterprises", whether forestry companies (HPH or HTI) or other companies associated with the use of forest land, such as plantation and mining companies (**Table 5.63**).

Table 5.63. Ranking of "Negative Image" of Speaking Actors Related to Forest Fire Issues According to Stakeholders' Perceptions

Speaking actors	Stakeholders' Perceptions		
	International & Regional	National	Local
Administrations	1	1	1
Scientists	6	5	6
Politicians	4	4	5
Community leaders	3	2	3
NGOs	5	3	4
Enterprises	2	6	2
Others	7	7	7

Source: primary data (2009), Note: ranking are started from 1 (most negative) to 7 (least negative)

According to stakeholders' perceptions at international, regional, and local organizations, "enterprises" in particular plantation companies, was one stakeholder that received many "negative images" other than "administrations". By law, plantations were required to be established only on forest land that has been officially designated for conversion to other uses, referred to as "conversion forest". Most of the stakeholders argued that "enterprises" were causers of problem of forest fires due to combustion activities they perform for land clearing activities from conversion forests into plantation development. Although the activities of land burning had been banned by the government, most of them still occurred due to technical and economic reasons.

5.3.4 Stakeholders' Perceptions toward Causes of Forest Fires in Indonesia

In Indonesia, pressures on forests for economic reasons especially for plantation development were very high. Most of the stakeholders agreed with Matthews (2002) who stated that establishing plantations in forest land is doubly attractive because, once having acquired a land-clearing license (IPK), a company can clear-cut the area and sell the timber to wood-processing industries. In many instances, plantation owners were also concession operators, so it represented a simple transfer from one company to another within the same group. The profit could be higher if plantation companies and local inhabitants set fire in preparing their plantation or farmland. The arguments were not only due to practicing the most simple technique for land preparation, but also, making cost effective. According to both reasons, plantation development in Indonesia promises a very attractive profit.

Therefore, referring to stakeholders' perceptions, all interviewed stakeholders at international, regional, national, and local levels agreed that the most cause of forest fire in Indonesia was "intentional causes", e.g. human activities that set fire for land clearing activities (**Table 5.64**).

Table 5.64. Causes of Forest Fires According to Stakeholder's Perception

Causes of Problems	Stakeholders' Perceptions		
	International & Regional	National	Local
Accidental	4	3	2
Inadvertent	2	2	3
Mechanical	3	4	5
Intentional	1	1	1
Others	5	5	4

Source: primary data (2009), Note: ranking are started from 1 (most important) to 5 (least important)

They hold that in Indonesia and some other Southeast Asian countries, burning had a long history as an effective method used in shifting agriculture, which often referred to as slash and burn agriculture. Nowadays, burning is still used not only by traditional people or local inhabitants but also by some large-scale enterprises due to cost-effective reasons.

Table 5.65 describes stakeholders' perception towards causes of forest fire in Indonesia, i.e. "intentional causes" (ITC), "mechanical causes" (MC), "accidental causes" (ACC), and "others". Included as intentional causes among others were land clearing for crops plantation, timber estate development, forestland encroachment, shifting agriculture, and tenurial conflicts. The mechanical causes involve activities of transmigration and infrastructure as well as mining. Accidental causes, on the other hand, covered such natural factors, as climate (El Nino and long drought) and natural burning coals under peat surfaces.

A striking difference was observed in the perceptions of stakeholders at local level, where the majority argued that in addition to land clearing for plantation activities, forest fires were also caused by natural factors; namely' the hot and prolonged dry weather as well as the burning of coal that naturally existed in the subsurface of peat soil in Kalimantan and parts of Sumatera. That is, in general, respondents at local level had the perception that besides land clearing activities, "natural factors" were also strongly influenced forest fires in Indonesia. In contrast to the respondents at local level, respondents in national

and international organizations tend to argue that human factor was a far more dominant factor in causing forest fires.

Table 5.65. Stakeholders' Perceptions toward Causes of Forest Fires in Indonesia

Causes	Stakeholders		
	International & Regional	National	Local
Human:			
1. Land clearing for crops plantation (ITC)	**1**	**1**	**1**
2. Timber estate development (ITC)	**3**	4	6
3. Forestland encroachment (ITC)	**2**	**3**	4
4. Shifting agriculture (ITC)	4	**2**	5
5. Tenurial conflicts (ITC)	5	5	7
6. Transmigration & infrastructure (MC)	7	7	8
7. Mining activity (MC)	9	9	9
Nature:			
8. Climate (ACC)	6	6	**2**
9. Burning coals (ACC)	8	8	**3**
10. Others	10	10	10

Source: Primary data (2009), Note: ranking are started from 1 (most important cause) to 10 (least important cause)

5.3.5 Stakeholders' Perceptions toward Solutions of Problem

According to stakeholders' perceptions, there were twelve things that could be classified as solutions of the problem. Out of the twelve solutions, each could be categorized into several instruments, i.e. "praxis" (PXI), "planning" (PLI), "informational" (IFI), "regulative" (RGI), "economic" (ECI), and "others" (**Table 5.66**).

All stakeholders perceived that "praxis instrument", i.e. applying technologies for land clearing without burning, was the most important solution of problem to prevent forest fire. Moreover, stakeholders at national level pointed at "social solutions" such as the application of collaborative forest management and community based forest management which was "praxis instruments" as the second most important solution to overcome forest fire. They believed that

Collaborative Forest Management was one promising forest management system, believed to be able to aid preventing and combating forest fires in Indonesia. Collaborative Forest Management was also a forest management approach that engaged the active role of the community to work together with the government or companies to manage and maintain a forest. Collaborative Forest Management required the equality of each party to cooperate. With the active participation of community in forest management, it was expected that forest fires could be prevented, or localized, and addressed as early as possible. On the contrary, stakeholders at international and regional levels put more emphasis on the importance of enforcing "regulative instruments", i.e. providing strong punishment for forest fire actors, as the most second important solution in overcoming forest fire. The third most important solution of problem according to these stakeholders was "planning instruments", especially making a consistent land-use planning.

Table 5.66. Solutions of Problem According to Stakeholders' Perceptions

Solutions	Stakeholders		
	International & Regional	National	Local
1. Applying zero burning technology for land clearing (PXI)	**1**	**1**	**1**
2. Limitation of the number of crops plantation (PLI)	9	8	9
3. Collaborative forest management (PXI)	6	**2**	4
4. Community based forest management (PXI)	8	**3**	7
5. Making a consistent land-use planning (PLI)	**3**	6	5
6. Extension of intensive agriculture to reduce shifting cultivation (IFI)	4	5	6
7. Improving regulation & strong punishment for fire's actor (RGI)	**2**	4	**3**
8. Applying compensation mechanism (ECI)	7	9	7
9. Applying early warning system for forest fire (PXI)	11	7	**2**
10. Increasing number of forest rangers (PXI)	10	10	10
11. Others	5	11	11

Source: Primary data (2009,) Note: ranking are started from 1 (most important solution) to 11 (least important solution)

According to the local stakeholders' perceptions, application of early warning system for forest fire ("praxis instrument") was the second most important solution of problem after application of zero burning technology for land-

clearing. Similar to stakeholder's perception at international organization, the next most important solution of problem stated by local stakeholders was improving regulations, especially in ensuring the existence of regulations that provided heavy punishment for actors in forest fire ("regulative instruments"). Several other solutions of problem referred to by stakeholders included: limiting the granting of land clearing for crop's plantations ("planning instruments"), applying a compensation mechanism for the causers of fire ("economic instruments"), increasing the number of forest rangers and forest fire personnel ("praxis instruments"), as well as other efforts, such as: increasing the quality and number of equipments or facilities for extinguishing forest fires.

5.3.6 Are Forest Fire Responsible for Global Climate Change?

Stern (2006) stated that an increase of carbon emission into the atmosphere is the main cause of Global Climate Change. One important source of carbon emission is forest degradation, which in parts was caused by forest fire. This section evaluated the perceptions of stakeholders at international, regional, national, and local levels, as to whether forest fires were responsible for Global Climate Change or not (**Figure 5.18**).

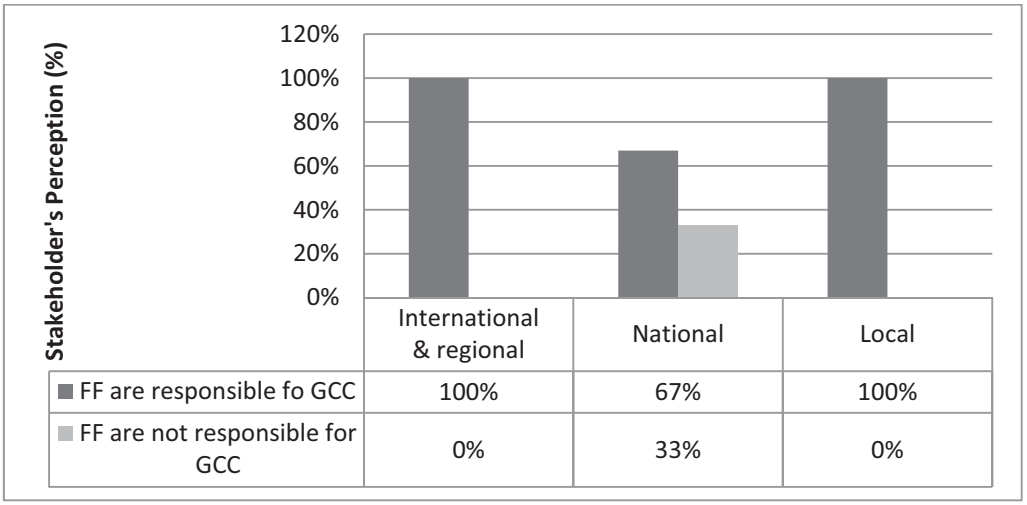


Figure 5.18. The Roles of Forest Fire towards Global Climate Change According to Stakeholders' Perceptions

All stakeholders at international, regional, and local levels shared common perceptions that forest fires were responsible for global climate change. The majority of stakeholders at national level had similar opinion. Unlike the majority of statements in national media that did not mention the relationship between forest fire and global climate change, most stakeholders at national level believed that there was a relationship between forest fires and global climate change.

5.3.7 Frames of Stakeholders' Perceptions toward Forest Fire Issues in Indonesia

This section discussed the "frame" of stakeholders' perceptions toward forest fire issues in Indonesia. The approach used in identifying stakeholders' perceptions on "frames" was similar to the evaluation of "frames" in media, namely: "problem's definition", "causal interpretation", impact evaluation", and "policy recommendation" (**Table 5.67**).

Table 5.67. Stakeholders' Perceptions toward Frames of Forest Fires in Indonesia

Stakeholder	Problem's definition		Causal Interpretation		Impact Evaluation		Policy Recommendation	
	Economy	Ecology	Human	Nature	FF are responsible for GCC	FF are not responsible for GCC	National regulation	International convention
International & regional	75%	25%	100%	0%	100%	0%	100%	0%
National	100%	0%	100%	0%	67%	33%	100%	0%
Local	100%	0%	56%	44%	100%	0%	100%	0%

More than 75% of stakeholders in international and regional levels defined forest fires problem as an "economic problem" and only 25% who regarded forest fire issues as closer to ecological problems. Similar opinions were conveyed by all stakeholders at national and local levels.

All stakeholders at international, regional, and national levels assumed that the main cause of forest fires was "human activities". This was somewhat different from the perceptions of stakeholders at local level where almost half of the views were on "nature", although overall, the numbers of stakeholders who considered "human activities" as the main cause of forest fires in Indonesia were only slightly larger.

In looking at the roles of forest fire in influencing global climate change, all stakeholders at international, regional, and local levels had the perception that "forest fires were responsible for global climate change". While at national level, one-third of the stakeholders interviewed considered "forest fires were not responsible for global climate change".

In order to prevent and overcome the problems of forest fires, all stakeholders at international, regional, national, and local levels, emphasized the importance of improving and strengthening "national regulations" rather than ratifying "international convention" on forest fires.

5.4 Discussion: Comparison between Media and Stakeholders' Perspectives

This sub-chapter compared the perspectives of media and stakeholders towards forest fire issues. Some of the things being compared, among others were: the role of actors especially scientists in decision-making, perspectives of media and stakeholders (human vs. nature), causes of problem, instrument's solution of problem, and framing.

5.4.1 The Role of Actors in Decision Making

According to stakeholders' perceptions, "administrations", "scientists", and "media" were the three most important factors in forest fire discourses (**Figure 5.68)**.

Table 5.68. The Most Important Actors in Forest Fire Discourse According to Media and Stakeholders

Levels of Importance's Actors	News Media		Scientific Journals		Stakeholders		
	Global	National	Interna-tional	National	Intl & Regional	National	Local
Very important	Media	Adminis-trations	**Scientists**	**Scientists**	**Scientists**	Adminis-trations	Adminis-trations
Important	Adminis-trations	Media	Organiza-tions	Adminis-trations	Adminis-trations	**Scientists**	**Scientists**
Moderately important	Organiza-tions	NGOs	Politicians & Enterprises	Organiza-tions	Media	Media	Media

"Administrations" was the actor who played a very important role in influencing decision-making based on the perceptions of stakeholders and very dominant in forest fire discourses in news media, particularly in national media. Opinions of "administrations" were also relatively frequently referred to in national journals, but given less attention in international journals.

All of the stakeholders in international, regional, national and local organizations observed the importance of the roles of "media" in influencing decision-making regarding forest fire issues. Opinions of these stakeholders corresponded to the dominance of "media" in forest fire discourses in news media. However, "media" had less important role in forest fire discourse within the scientific arena, i.e. international and national journals. This happened because generally news in news media was more of general nature; thus, less widely referenced referred to (addressed) by authors of articles in scientific journals. In accordance to its character as scientific media, most of the articles in journals had specific themes hence it was less appropriate to refer to news media.

The intended segment of audience for scientific media was scientists, and therefore, it seemed sensible that the roles of scientists as speaking actors were very dominant in journals. The majority of stakeholders also argued that the roles of “scientists” were very important in influencing decisions and/or policy-setting agenda. However, unlike scientific media and stakeholders’ perceptions, the roles of "scientists" in a forest fire discourse in news media were very low. This was consistent with the characteristics of news media where it concerned more with the speed in reporting an issue rather than the depth of the analysis of an issue.

However, stakeholders’ perceptions of the significant roles of "scientists" in influencing policy agenda-setting were interesting to discuss. Perceptions of stakeholders were in line with Dunn’s (2000) statement that "scientists" have very significant roles in ensuring the existence of knowledge utilization in policy-making process. What is said by Dunn is in line with the statement made by Pielke (2006) that "scientists" are seeking to play a role in policy and contribute to the sustainability of scientific enterprise. Accordingly, scientists were concerned on how science can best contribute to policy making. Dunn argues that utilization of useful knowledge by policy makers would improve policy-making processes and outcomes. However, as underlined by May (1990) in Pielke (2007), "The role of the scientist is not to decide between the possibilities but to determine what the possibilities are".

It is interesting to examine the stakeholders' perceptions of the role of "scientists" in policy making by referring to the framework approach by Pielke (2007). Stakeholders perceived that in general "scientists" could influence the decision-making through three ways; namely,: first, "scientists" were requested to work on a certain institution as an "advisor". This was found to be common in almost all institutions where the interviewed stakeholders work. In the Ministry of Forestry, for instance, there were several senior Forestry Minister's advisors who were "scientists" and ready to provide answers or advices on forestry issues. Referring to the Pielke (2007), these scientists were classified as "science arbiters".

Second, "scientists" could affect decision-making policy through advocacy of important issues echoed in conferences, workshops, discussion forums, dialogues, or policy briefs. Referring to the approach by Pielke, the role of these scientists could be classified as "issue advocate ".

In some problems considered very important, an institution may request inputs or advices from an independent team of scientists from various scientific backgrounds. Advices given were usually comprehensive and relatively free of intervention powers. These scientists were classified by Pielke as "honest broker of policy alternative".

Therefore, it is clear that the interviewed stakeholders in Indonesia, in general, did not view scientists as "pure scientists" who only examine the issues regardless of policy making process. Conversely, stakeholders have very strong perceptions that "scientists" played roles in policy making process, either as a "scientist arbiters", "issue advocates", or "honest brokers".

Referring to the theoretical framework given by Pielke, all of these roles were critically important and necessary in a functioning democracy, and "scientists", similar to other members of society, have to choose. However, he held that the "scientist" as "honest broker" would be a powerful role to facilitate the creation of new and innovative policy alternatives. Therefore, the most suited role for scientists was to be an "honest broker of policy alternative", which engaged in

decision making by clarifying and, at times, seeking to expand the scope of choices available to decision makers.

5.4.2 Perspectives of Media and Stakeholders: Human vs. Nature

In general, news media, scientific journals and stakeholders were more inclined to position human as causers, helpers, and victims of problem of forest fire (**Table 5.69**).

Table 5.69. Major Perspectives of Media and Stakeholders toward Causers, Helpers, and Victims

Major Perspectives	News Media		Scientific Journals		Stakeholders		
	Global	National	Interna-tional	National	Intl & Regional	National	Local
Causers	Human	Human	Human	Human	Human	Human	Human
Helpers	Human	Human	Human	Human	Human	Human	Human
Victims	Human	Human	**Nature**	**Nature**	Human	Human	Human

In looking at these interest positions, the difference was found only in scientific journals which view "nature" as the main victims of problem of forest fire. As for the rest, stakeholders, news media and scientific journals regarded forest fire position to be closer to the influence of human factors, including social conditions. This showed that to solve forest fire problems effectively, social approaches were very important to put forward. Without considering social issues, any efforts made to prevent and combat forest fires would never be effective.

5.4.3 Causes of Problems on Forest Fire: Media vs. Stakeholders' Perspectives

In view of "causes of the problem" of forest fire, all stakeholders in international, regional, national and local levels shared similar perceptions. They believed that the problems of forest fires were mostly caused by deliberate factors or "intentional causes" (**Table 5.70**).

Table 5.70. Major Important Causes of Problems on Forest Fires in Media and Stakeholders' Perspectives

Levels of Importance's Causes	News Media		Scientific Journals		Stakeholders		
	Global	National	Interna-tional	National	Intl & Regional	National	Local
Very Important	Accidental	**Intentional**	Accidental	Accidental	**Intentional**	**Intentional**	**Intentional**
Important	Inadvertent	Inadvertent	**Intentional**	**Intentional**	Inadvertent	Inadvertent	Accidental
Moderately Important	**Intentional**	Accidental	Mechanical	Mechanical	Mechanical	Accidental	Inadvertent

Perceptions of stakeholders at national level in viewing causes of problems of forest fires were identical to the perspectives of national media. Similar to stakeholders' perceptions, national media assumed that most of the forest fires were caused intentionally. "Inadvertent" or carelessness from a human activity formed the second biggest cause of problems of forest fires. This was stated by global and national media, national journals, as well as stakeholders of international, regional, and national organizations.

In the perspectives of global media as well as international and national journals, forest fires that occurred "accidentally" were due to natural factors mainly because of hot temperatures and prolonged drought. This however, did not mean that "nature" was the major cause of forest fire because when added together, the cumulative causes of other forest fires were actually dominated by human factors categorized as "intentional", "inadvertent", or "mechanical".

5.4.4 Instruments of Solution of Problems on Forest Fires: Media vs. Stakeholders' Perspectives

All stakeholders of international, regional, national, and local organizations as well as speakers in news media and scientific journals stated that the most important instrument to tackle the problems of forest fires was "praxis" (**Table 5.72**).

Table 5.71. Major Important Instruments of Solution of Problems on Forest Fires in Media and Stakeholders' Perspectives

Levels of Importance of Solution's Instruments	News Media		Scientific Journals		Stakeholders		
	Global	National	Interna-tional	National	Intl & Regional	National	Local
Very Important	**Praxis**	**Praxis**	**Praxis**	**Praxis**	**Praxis**	**Praxis**	**Praxis**
Important	Economical	Regulative	Planning	Regulative	Regulative	Regulative	Regulative
Moderately Important	Regulative	Informa-tional	Regulative	Planning & Procedural	Planning	Informa-tional	Informa-tional

Although both news and scientific media pointed to "praxis" as the most important solution in addressing forest fires, the emphasis and examples often cited by news media, scientific media, and stakeholders were different. All stakeholders agreed that the most effective solution to prevent and combat forest fires was through the application of "zero burning" in land clearing activities. Furthermore, the active involvement of community in forest management was also considered by most stakeholders as an effective solution to prevent and overcome the problem of repeated forest fires in Indonesia.

"Praxis" instruments that were mostly appointed by news media were solutions relating to direct efforts to address forest fires, such as extinguishing a fire with water bomber, the deployment of forest rangers and fire fighters to extinguish the fire, or spraying water by using aero-planes or helicopters. Meanwhile, many scientific journals raised "praxis" instruments relating to efforts to prevent

forest fires, such as: implementation of silvicultural techniques that can prevent fires, for example, planting fire resistant trees as fire breaks, applying better harvesting techniques, and using weather forecasting models to anticipate and address the problems of forest fires. In addition to "praxis", all stakeholders, news media, and scientific journals recalled "regulative instruments" as one important solution that could not be ignored in the management of controlling, preventing, and combating forest fires in Indonesia, including in regulating the legal sanctions for offenders of the rules and perpetrators of crimes that led to forest fires.

5.4.5 Framing of Forest Fire Issues: Media vs. Stakeholders' Perspectives

There were some fundamental differences between stakeholders' perceptions and media perspectives in defining the problem of forest fires. All stakeholders at international, regional, and national organizations, as a whole, viewed the "frame" of the problems of forest fires was closer to the dimensions of "economy" instead of "ecology". On the contrary, the media both news and scientific media tend to discuss the reverse (**Table 5.72**).

Table 5.72. Frames of Forest Fire Issues in Media and Stakeholders' Perspectives

Frames	News Media		Scientific Journals		Stakeholders		
	Global	National	Interna-tional	National	Intl & Regional	National	Local
Problem Definition	Environ-ment	Environ-ment	Environ-ment	Environ-ment	Economy	Economy	Economy
Causal Interpretation	Human activities	Human activities	Human activities	Human activities	Human activities	Human activities	Human activities
Impact Evaluation	FF are responsible for GCC	Not recogniz-able	FF are responsible for GCC	FF are responsible for GCC	FF are responsible for GCC	FF are responsible for GCC	FF are responsible for GCC
Policy Recom-mendation	National regulations	National regulations	National regulations & International conventions	National regulations	National regulations	National regulations	National regulations

Although in defining the problem, the context of articles and statements published in news media and journals, were more related to environment, but in view of the causes of forest fires, many mentioned "human activities" as the most important factor causing forest fires. This frame was in line with the views of stakeholders who had similar perspective in viewing "human activities" as the main cause of forest fires.

In general, the perceptions of stakeholders, media, and journals had similarities in looking at forest fire as responsible for Global Climate Change. The difference was only found in national journals that did not contain news mentioning the role of forest fire in influencing global climate change or vice versa. This means, as a whole, except the national media, forest fire issues were seen as an integral part of a larger issue, namely the global climate change.

Nevertheless, although forest fires were blamed as causing global climate change, the problems of forest fire alone were considered by many as local or national problems. It was only the international journals which stated the importance of “international convention” and “national regulations” to regulate, prevent and combat forest fires. Whereas all stakeholders, media and journals had similar perspectives that to prevent and combating forest fire, “national regulations” were more effective means rather than “international convention”.

This frame of media and stakeholders in emphasizing the importance of "national regulations" compared to "international convention" were in line with the opinion of Morgera and Cirelli (2009) in their book "Forest Fire and the Law" which stated that "national regulations" was the cornerstone in preventing and overcoming forest fires. "International convention" could not stand alone without "national regulations". A convention can only be meaningful and effective, only and if only, adopted by the government and translated into "national regulations". According to the book, some of the most important national regulations necessary for preventing, controlling, and combating forest fires include "forest legislations", "civil protection/disaster management legislation", "(central and local) government structure legislation", "land use planning regulations and instruments", "environmental legislation", "wildlife / hunting

legislation", "agricultural legislation", "protected area legislation", "water pollution legislation", and "criminal law and civil law", which regulated sanctions and compensations.

CHAPTER 6

CONCLUSIONS

Forest fire is one of the most frequent issues in forestry discourses. This study focused on examining forest fire discourse in news media (global and national media), scientific media (international and national journals) and stakeholders' perceptions (international, regional, national, and local organizations). There are several important tasks of study, i.e. to investigate the interest position of actors by evaluating common and different features of forest fire discourse in the national and global media as well as stakeholders' perceptions; knowing the impact of globalization in media, among others by examining imbalance perspectives in national and global media discourse; to evaluate the role of scientists to influence decision makers through knowledge utilization in policy-making; and to understand the contribution of media in influencing stakeholders by identifying asymmetrical perspectives concerning forest fire issues in media discourses and stakeholders' perceptions.

6.1 Features of Forest Fire Discourses in Media and Stakeholders' Perceptions

The study concluded that there were some common and different features of forest fire discourses in media and stakeholders' perceptions. Those features will be explored in the following sections.

6.1.1 Common Features

There were several common features of forest fire discourses in the national and global media identified in the study:

- “Media” dominated discourses of forest fire issue in the national and global news media. Thus, the issues of forest fire in media as mediality were very important in the media discourse. Besides “media”, "administrations" were also frequently referred to speaking actors of forest fire discourses in both national and global media. According to the voice of speakers in forest fire discourses in the national media, “administrations” such as ministers, regional environmental board, forest services, and natural conservation offices were mostly positioned as helper of problems. Consequently, the actors positioned as “helpers” usually gain positive image from society. On the opposite, “enterprises” were actors who mostly pointed out as the causers of problem in the issues of forest fire in the national media. The same feature was also perceived by stakeholders who appointed “enterprises” as the main causers of forest fire.

- In overall, media and stakeholders were generally more inclined to position human as causers and helpers of problems of forest fires. Because forest fires were strongly related to human factors, the interviewed stakeholders mostly perceived that to solve forest fire problems effectively, social approaches were very important to put forward.

- In media discourse on forest fires, various means of solving problems such as policy instruments, were introduced. Speakers in the national media and global media mostly proposed that the important instruments to solve the problems of forest fires were "praxis". Different ways of “praxis” to solve problems were suggested, including implementation of silvicultural and harvesting practices, utilization of tools (water cannons, helicopters, or airplanes) to extinguish fire, and involve people participation in fire management.

- Besides “praxis”, “regulative instruments” were also very important to solve the problems of forest fires. Although, most speakers perceived that forest fires contribute to global climate change, they did not appoint forest fire as a global concern. The problems of forest fire alone were considered by many speakers in media as local or national problems. Most interviewed stakeholders in international, regional, national, and local organizations also

perceived the same perspectives. Therefore, in terms of choosing regulative instruments, both speakers in media and stakeholders argued that the "national regulations" would be more effective means to regulate forest fires rather than "international conventions". Moreover, "International conventions" could not stand alone without "national regulations". International conventions can only be effective, if they are adopted by the government and translated into "national regulations".

- In national and global media discourses on forest fires, local and national events were dominant. In the selected articles, the speakers also voiced that forest fires created cross-country border impacts particularly within Southeast Asian countries. Forest fires were supposed to be the causes of some regional problems such as disturbance of transportation and tourism sector due to "smog" (smoke and fog) as well as a threat for health because of heavy air pollution within the region. Therefore, some speakers also proposed "procedural instruments" such as inter-governmental meeting and intersectoral coordination to solve those problems.

6.1.2 Different Features

Besides discussing the common features, this study also identified several different features of media discourses in forest fire in the news media and scientific journals, as follows:

- According to the "valence of event", global and national media had different perspectives on forest fires. Almost all articles in global media perceived "negative" valence for forest fire, such as hazardous smog, air pollution, and loss of vegetations. Most of forest fire articles in national media, however, contained "ambivalent" valence. Besides stating negative sides of fires, the national media and scientific journals generally also voiced the positive aspects of fires such as enrichment of soil fertility or viewing efforts to combat fires. It means that, compared to the global media, national media and scientific journals shared more neutral views of forest fire issues. In fact, despite speaking merely about the negative impacts of forest fires, they also discussed solutions as well as efforts to overcome the problems.

- In looking at interest position of victims, the news media and national journals perceived that the victims of forest fires are mostly “human”. However, another opinion was argued in the international journals, which viewed "nature" as the main victims of problem of forest fires. In view of "causes of the problem" of forest fire, speakers in national news media believed that the problems of forest fires were mostly caused “intentionally”. In contrast to the national news media, speakers in the global news media and scientific journals perceived that most causes of forest fire were due to “accidental cause”. This clearly pointed out the different feature between national and global media toward “victims” and “causes” of forest fire.

6.2 Imbalance Perspectives in Media Discourses

It was commonly known that forest fires had a large scope of event and also caused serious trans-national boundaries’ problems. However, the study indicated that the concern of global media in forest fires were mostly on the events located in high-income countries, particularly North American region. The imbalance of the global attention on forest fire events in the other part of the world could not be separated from the reality of the domination of speaking actors in the global media, who originated from a narrow region of the two high-income countries, namely USA and Canada.

This study pointed to a very strong domination of speaking actors from high-income countries in media discourse on forest fire. In global media, speakers from high-income countries spoke-out the largest number of statements on forest fire discourses. In scientific discursive arena, authors from high income countries contributed more than 90% of articles concerning forest fire issues in international journals. The domination of speakers from high-income countries created imbalance perspectives in news and scientific media discourse, where the information will be closer to the interests of speakers. It leads for a situation of homogenous information, which is according to Reese (2008), the entire world need not be tuned into the same media (interests) and products need not be completely homogenous.

Referring to the scope of event of forest fire issue, it was clearly seen that global media did not pay as many attention to global scope of events as they did to national or local events. Overall, out of the total statements in the global media, only few of them concerned the global scope of event. Instead of discussing global event, global media were largely accommodated local and national forest fire issues. Therefore, it could be concluded that global media did not focus on global concerns, but on the local ones. It refers to the arguments of Reese (2008) that although due to a worldwide circulation they are called global media, but factually their audience is very small.

The hegemony of authors and speakers from high-income countries in global media could be results of one or more different arguments. The simplest arguments explained that the domination of speakers was from high-income countries, especially America, in the global media because they speak English as a world language (Sparks 1998). Despite the language factor, this study appointed that global media were heavily biased to the perspectives of high-income countries and factually they gave only very limited access and participation for speakers from low and middle income countries. It means, global media accommodated only the elite groups of world's society (speakers from high-income countries). Referring to Pan and Kosicki (2001), it could be stated that the (global) media are not neutral arena in public deliberation, (particularly in forest fire discourses).

In the view of globalization, adopted from Eriyanto (2005), hegemony of speakers from high-income countries reflected imbalance situations of global society. In forest fire discourses, for instance, global media mostly appointed "accidental causes" as the main cause of forest fire. On the other hand, national media usually referred that the most causes of forest fire were "intentional". This situation led to further biased solutions of problems. The global media commonly perceived that "equipments or tools", such as satellite sensor, modern equipped fire fighters, or water bomber's airplanes, were the most important solutions for combating fires. The selected global media usually suggested to use "modern tools" to extinguish fires, but failed to identify the "roots of problems" of fires in lower income countries. The global media perspective was different from the national media in Indonesia, which perceived

that most forest fires were caused intentionally, mainly due to burning practices for land clearing activities. These practices of burning strongly related to social and economic dimensions. Consequently, although many assistances and aids had been given by high-income countries to combat forest fire in Indonesia, they did not work effectively because they were mostly dealing with "improvement of tools" rather than "improvement of social approaches".

Moreover, White (1950) also argued that a bias of information in news media commonly occurs because "news" is not facts written by the journalists but selected information driven by supervisors, editor in chief, capital owners, or political interests of the media. There, the media belonged to and dominated by the powerful group of society, where the powerless would be marginalized. This situation, according to Tomlison (1991), could be referred also as (cultural) media imperialism. Referring to the case of discourses between "improvement of tools" versus "improvement of social approaches" as respective solutions of problem in global and national media (and stakeholders), it could be concluded that instead of getting "enlightens", the powerless was forced to receive "irrelevant" solutions from the dominant group of world's society, e.g. through international aids or technical assistances.

6.3 Knowledge Utilization in Policy-Making

Sidney Kobre *in* Rivers *et al.* (2003) argued that one of the natural obligations of the news media is educating people, among others by giving comprehensive information about certain issues. For its purpose, "scientists" should be referred as one of the most important speakers in the news media. In fact, however, this study shows that the role of "scientists" in a forest fire discourse in news media was very low. It could be caused by a simple reason, i.e. the characteristics of a news media are usually concerned more with the speed in reporting an issue rather than the depth of the analysis of an issue. Borrowing the arguments of Rivers *et al.* (2003), low presentation of scientists in the news media is due to an argument that commonly "sensation" of news is much more important than "substance" of news.

Although the reason for poor presentation of scientists in the news media is able to be simply explained, according to the process of policy making given by Dunn (2000), the implication of the low representation of scientists in the news media could not be simplified. When “scientists” less contributed to forest fire discourses in the news media, it means, news media did not utilize knowledge of scientists as the most reference in the discourse of forest fire. Therefore, it could be concluded that “knowledge utilization” in the news media was very poor. In contrast with news media, “scientists” were very dominant in forest fire discourses in the journals. Since, their readers were mostly also “scientists”, the use of knowledge in the scientific journals were also very high. The “use of knowledge” is not automatically parallel with the level of “knowledge utilization”. Borrowing the Dunn’s argument, “knowledge utilization” has a specific meaning that is utilization of knowledge by decision makers in order to improve process and result of decision-making. It means that writing articles in scientific journals is very important to share information and exchange knowledge among scientists, but not to influence policy-making.

According to stakeholders’ perceptions, forest fire discourses in "journals" in most cases were only suitable for scientific consumption, but they had a large gap with the policy makers as well as public concerns. Therefore, knowledge information in journals could not be transformed into “knowledge utilization”. Scientists could influence policy-making, if they make communication with the public, because coined to Roelofs *in* Nimmo (2004:8) basically politic is a communication activity among people. Accordingly, stakeholders perceived that instead of scientific articles in the journals, “scientists” played very important roles to influence policy-making process through “policy presentations”, i.e. ways of knowledge communication through interactive manners, among others by sounds of articles in public media, dialogues, conferences, meetings, and public hearings (Dunn 2000), so called “issue advocate” (Pielke 2007). Besides those ways, “scientists” also influenced policy-making by giving “direct advisories” to decision makers. These roles, according to Pielke, could be played by “scientist arbiters” and “honest broker scientists”. These arguments were in line with perception of the interviewed stakeholders. Stakeholders in the Ministry of Forestry, for instance, argued that

the minister was assisted by some scientists, worked as senior advisors ("scientist arbiters"), to help to give alternatives in policy making. The Ministry of Forestry also often asked to the scientists who wrote articles or gave statements in the news media towards certain issues to give explanations, clarifications, or inputs to improve a respective policy ("issue advocate scientists"). To formulate or evaluate an important policy, usually the ministry asked a team of scientists coming from different fields of sciences ("honest broker scientists") to conduct a comprehensive study before decisions were made.

6.4 Asymmetrical Perspectives Concerning Forest Fire Issues in Media Discourses and Stakeholders' Perceptions

There were several asymmetrical perspectives between media discourses and stakeholder's perceptions, as the following:

- Stakeholders perceived that forest fires were mostly caused "intentionally", for instance, fire setting for preparing garden, plantation and shifting cultivation, or slash and burn agriculture. In contrast to stakeholders' perceptions, many causes of forest fire according to global media discourses were identified as "accidental", due to natural factors such as long drought period or natural burning coal under peat surfaces.

- Although both media and stakeholders pointed to "praxis" as the most important solution in addressing forest fire, they emphasized different matters. Stakeholders emphasized on application of "zero burning" in land clearing activities, involvement of forest communities in forest management, and preventing and combating forest fire as the most effective solution. Global news media, however, pointed to direct efforts to address forest fires, such as extinguishing fires with water shooters or spraying water by using airplanes as the most frequent solutions. Meanwhile, scientific journals usually emphasized on preventive efforts as solutions, e.g. implementation of better silvicultural techniques or appropriate harvesting system that can prevent fires.

- There were some asymmetrical perspectives between stakeholders' perceptions and media discourses in defining the problem of forest fires. Stakeholders perceived that forest fires were closely related to "economic problems", but media usually discussed forest fires on the perspective of "ecological concerns".

Measuring the asymmetrical perspective of media and stakeholders is primary important because basically, according to Palmer (2004), media could play important roles in directing opinions of the society as well as influencing policy-making processes. Rivers *et al.* (2003:313) argued that the role of media in driving public opinion is strongly determined by the perspectives of media related to individual behaviours, aspirations, expectations, and fears of people. Therefore, understanding asymmetrical perspectives between media and stakeholders is needed to measure the potential influence of media in directing public opinion as well as policy-making process. The role of media to influence policy-making depends on the similarities of media perspectives and stakeholder perceptions. In forest fire discourses, it could be stated that the higher the asymmetrical perspectives between media and stakeholders in certain matters e.g. causes or solutions of problem, the lower the role of media to influence policy-making processes related to those matters.

SUMMARY

This study focused on examining forest fire discourses in news media (global and national media), scientific media (international and national journals) and stakeholders' perceptions (international, regional, national, and local organizations). There are several important tasks of this study, i.e. understanding the interest position of actors by investigating common and different features of forest fire discourses in media as well as stakeholders' perceptions; examining imbalance perspectives between national and global media discourses; evaluating the role of scientists in influencing policy-making process; and identifying asymmetrical perspectives concerning forest fire issues in media discourses and stakeholders' perceptions.

Several common features of forest fire discourses in the national and global media were identified in this study. It could be generally concluded that the issues of forest fire in media as mediality were very important in the media discourse. Besides, "media", "administrations" were also frequently referred to speaking actors of forest fire discourses. According to the voice of speakers in forest fire discourses in the national media, "administrations" such as ministers, regional environmental board, forest services, and nature conservation offices were mostly positioned as helper of problems. Consequently, the actors positioned as "helpers" usually gained positive image from society. On the contrary, "enterprises" were actors who mostly pointed out as the causers of problems in the issues of forest fire in the national media. The same feature was also perceived by stakeholders who appointed "enterprises" as the main causers of forest fire.

Media and stakeholders were more inclined to position human as causers and helpers of problems of forest fire. Because forest fires were strongly related to human factors, the interviewed stakeholders mostly perceived that to solve forest fire problems effectively, social approaches were very important to put forward. Furthermore, Media and stakeholders commonly comprehended that

the most important instruments to solve the problem of forest fires were "praxis", such as implementation of silvicultural and harvesting practices, utilization of tools (water cannons, helicopters, or airplanes) to extinguish fires, and involvement of people participation in fire management. "Regulative instruments" were also very important to solve the problem of forest fire. In choosing regulative instruments, both media and stakeholders argued that the "national regulations" would be more effective means to regulate forest fire rather than "international conventions". International conventions can only be effective, if they are adopted by the government and translated into "national regulations". It was also commonly voiced that forest fires created cross-country border impacts and they were supposed to cause some regional problems such as disturbance of transportation, tourism, and health due to "smog" and heavy air pollution within the region. Therefore, "procedural instruments" such as inter-governmental meeting and intersectoral coordination were also suggested to solve those problems.

This study also identified some different features of media discourses in forest fire in the news media and scientific journals. Global and national media had different "valence" on forest fire. Generally, global media perceived "negative" valence for forest fire, such as hazardous smog, air pollution, and loss of vegetations; however, national media and scientific journals usually perceived "ambivalent" valence. It means, despite the negative impact of forest fires, they also discussed solutions as well as efforts to overcome the problems. Thus, compared to the global media, national media and scientific journals shared more neutral views on forest fires. When viewing the interest position of victims, the news media and national journals perceived that the victims of forest fire are mostly "human". However, another opinion was argued in the international journals, which viewed "nature" as the main victims of problem of forest fire. In view of "causes of the problem" of forest fire, speakers in national news media believed that the problems of forest fires were mostly caused "intentionally". In contrast to the national news media, speakers in the global news media and scientific journals perceived that most causes of forest fire were "accidental cause". It clearly pointed out the different features between national and global media toward "victims" and "causes" of forest fire.

Besides understanding the common and different features of media discourse, this study also evaluated the imbalance perspectives of forest fire issues between global and national media. This study appointed that the concern of global media in forest fire were mostly on the events located in high-income countries, particularly North American region. The imbalance of the global attention on forest fire events in the other parts of world could not be separated from the reality of the domination of speaking actors in the global media, who originated from two high-income countries, i.e. USA and Canada. The domination of speakers from high-income countries created imbalance perspectives in news and scientific media discourse, where the information would be closer to the interests of speakers. Referring to the scope of event of forest fire issues, it was clearly seen that global media did not pay as many attention to global scope of events as they did to national or local events.

The hegemony of authors and speakers from high-income countries in global media could be the results of one or more different arguments. The simplest argument explained that the domination of speakers from high-income countries, especially the American, in the global media was because they spoke English as a world language. It could be also noted that the (global) media were not neutral arena in public deliberation, particularly in forest fire discourses. In the view of globalization, hegemony of speakers from high-income countries reflected imbalance situation of global society. In forest fire discourses, for instance, global media mostly appointed “accidental causes” as the main cause of forest fire. On the other hand, national media usually addressed that the most causes of forest fire were “intentional”. This situation led for further biased solutions of problems. The global media commonly perceived that “modern equipments”, such as satellite sensor, modern equipped fire fighters, or water bomber’s airplanes, were the most important solutions for combating fires, but they failed to identify the “roots of problems” of fires in lower income countries. The global media’s perspective was largely different from the national media’s, which perceived that most forest fires were caused intentionally, mainly due to burning practices for land clearing activities. These practices of burning strongly related to social and economic dimensions. Consequently, although many assistances and aids had been given by high-

income countries to combat forest fire in lower income countries, they did not work effectively because they were mostly dealing with “improvement of tools” rather than “improvement of social approaches”. Accordingly, instead of getting “enlightens”, the powerless received “irrelevant” solutions from the dominant group of the world’s society.

The other important result of this study is understanding the “knowledge utilization” in policy-making, among others by evaluating the roles of “scientists” in forest fire discourses in media and stakeholders’ perceptions. This study shows that the role of "scientists" in forest fire discourse in news media was very low. It could be caused by a simple reason, i.e. the characteristics of news media that were usually concerned more with the speed in reporting an issue rather than the depth of the analysis of an issue. Low presentation of scientists in the news media was also due to an argument that commonly “sensation” of news is much more important than “substance” of news.

According to stakeholders’ perceptions, forest fire discourses in "journals" in most cases were only suitable for scientific consumption, but had a large gap with the policy makers as well as public concerns. Scientists could influence policy-making, if they made communication with the public, because basically politic is a communication activity among people. Accordingly, stakeholders perceived that instead of writing scientific articles in the journals, “scientists” played very important roles in influencing policy-making process through “policy presentations”, i.e. news media articles, dialogues, conferences, meetings, and public hearings, so called “issue advocate”. Beside those ways, “scientists” also influenced policy-making by giving “direct advisories” to decision makers. These roles could be played by “scientist arbiters” and “honest broker scientists”. These arguments were in line with the perceptions of the interviewed stakeholders.

Finally, the study identified some asymmetrical perspectives concerning forest fire issues in media discourses and stakeholders’ perceptions. Several asymmetrical perspectives were concluded. This study pointed out that stakeholders perceived that forest fire were mostly caused “intentionally”, for instance, fire setting for preparing plantation and shifting cultivation, or slash

and burn agriculture. In contrast to stakeholders' perceptions, many causes of forest fire according to global media discourses were identified as "accidental", due to natural factors such as long drought period or natural burning coal under peat surfaces. Although both media and stakeholders pointed "praxis" as the most important solution in addressing forest fire, they emphasized different matters. Stakeholders emphasized application of "zero burning" in land clearing activities and involvement of forest communities in forest management as the most effective solution to prevent and combat forest fire. Global news media, however, pointed to direct efforts to address forest fires, such as extinguishing fires with water shooters or spraying water by using airplanes as the most frequent solutions. Meanwhile, scientific journals usually emphasized on preventive efforts as solutions, e.g. implementation of better silvicultural techniques or appropriate harvesting system that can prevent fires.

There were some asymmetrical perspectives between stakeholders' perceptions and media discourses in defining the problem of forest fires. Stakeholders perceived that forest fires were closely related to "economic problems", but media usually discussed forest fires on the perspective of "ecological concerns". Measuring the asymmetrical perspective of media and stakeholders is primarily important because basically media could play important role in directing opinions of the society as well as influencing policy-making processes. The role of media in driving public opinion was strongly determined by the perspectives of media related to individual behaviours, aspirations, expectations, and fears of people. Therefore, understanding asymmetrical perspectives between media and stakeholders is needed to measure the potential influence of media in directing public opinion as well as policy-making processes. The role of media to influence policy-making depends on the similarities of media perspectives and stakeholder perceptions. In the forest fire discourse, it could be concluded that the higher the asymmetrical perspectives between media and stakeholders in certain matters e.g. causes or solutions of problem; the lower the role of media to influence policy-making processes related to those matters.

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Appendix 1. Institutions of Interviewed Stakeholders (Key Persons)

No.	Level	Institution	Number Key Persons
1	**International & Regional**	Center for International Forestry Research (CIFOR)	1
		ASEAN Secretariat	1
		AKECOP Indonesia	1
		SEAMEO Biotrop	1
2	**National**	**Ministry of Forestry:**	
		Directorate General of Planology	1
		Directorate General of Forest Protection and Nature Conservation	1
		Directorate General of Forestry Production Development	1
		Directorate General of Forest Rehabilitation and Social Forestry	1
		Centre of Information Ministry of Forestry	1
		Forestry Research and Development Agency	1
		University: Faculty of Forestry IPB	2
		NGOs: Latin	1
		Forest enterprises:	
		KBT (Kemakmuran Berkah Timber)	1
		KL (Kiani Lestari)	1
		PK (Panca Karya)	1
3	**Province**		
	a. Riau	BLHD (Regional Environmental Board)	2
		BKSDA (Natural Resources Conservation Office)	1
		BAPPEDA (Reg. Development Planning Board)	1
		DISHUT (Provincial Forestry Service)	1
	b. East Kalimantan	BPKH (Forest Area Arrangement Board)	1
		BAPPEDA (Reg. Development Planning Board)	1
		BKSDA (Natural Resources Conservation Office)	1
		Faculty of Forestry, University of Mulawarman	1
	c. West Java	DISHUT (Provincial Forestry Service)	1
		BAPPEDA (Regional Development Planning Board)	1
		BPDAS (Watershed Management Board)	1
		Perum Perhutani (State-owned Forestry Enterprise)	1
	d. North Sulawesi	BKSDA (Natural Resources Conservation Office)	1
		DISHUT (Provincial Forestry Service)	1
		BPDAS (Watershed Management Board)	1
	e. Bali	BPKH (Forest Area Arrangement Board)	1
		BKSDA (Natural Resource Conservation Office)	1
	f. Bangka Belitung	BPDAS (Watershed Management Board)	1
		BPKH (Forest Area Arrangement Board)	1
		DISHUT (Provincial Forestry Service)	1
	g. Yogyakarta	BPDAS (Watershed Management Board)	1
		BKSDA (Natural Resource Conservation Office)	2
	TOTAL		**40**

Appendix 2. Income Clasification of Countries According to the World Bank (2004)

Country	Code	Region	Income Group
Argentina	ARG	Latin America & Caribbean	Upper middle income
Australia	AUS	_	High income OECD
Austria	AUT	_	High income OECD
Belgium	BEL	_	High income OECD
Bolivia	BOL	Latin America & Caribbean	Lower middle income
Brazil	BRA	Latin America & Caribbean	Lower middle income
Cameroon	CMR	Sub-Saharan Africa	Low income
Canada	CAN	_	High income OECD
Central African Republic	CAF	Sub-Saharan Africa	Low income
China	CHN	East Asia & Pacific	Lower middle income
Congo, Dem. Rep.	ZAR	Sub-Saharan Africa	Low income
Congo, Rep.	COG	Sub-Saharan Africa	Low income
Costa Rica	CRI	Latin America & Caribbean	Upper middle income
Croatia	HRV	Europe & Central Asia	Upper middle income
Czech Republic	CZE	Europe & Central Asia	Upper middle income
Denmark	DNK	_	High income OECD
Ecuador	ECU	Latin America & Caribbean	Lower middle income
Egypt, Arab Rep.	EGY	Middle East & North Africa	Lower middle income
Estonia	EST	Europe & Central Asia	Upper middle income
Ethiopia	ETH	Sub-Saharan Africa	Low income
Finland	FIN	_	High income OECD
France	FRA	_	High income OECD
Germany	DEU	_	High income OECD
Ghana	GHA	Sub-Saharan Africa	Low income
Greece	GRC	_	High income OECD
Greenland	GRL	_	High income OECD
Honduras	HND	Latin America & Caribbean	Lower middle income
Hong Kong, China	HKG	_	High income OECD
Hungary	HUN	Europe & Central Asia	Upper middle income
Iceland	ISL	_	High income OECD
India	IND	South Asia	Low income
Indonesia	IDN	East Asia & Pacific	Lower middle income
Ireland	IRL	_	High income OECD
Israel	ISR	_	High income OECD
Italy	ITA	_	High income OECD
Japan	JPN	_	High income OECD
Korea, Dem. Rep.	PRK	East Asia & Pacific	Low income
Korea, Rep.	KOR	_	High income OECD
Malaysia	MYS	East Asia & Pacific	Upper middle income

Country	Code	Region	Income Group
Mexico	MEX	Latin America & Caribbean	Upper middle income
Myanmar	MMR	East Asia & Pacific	Low income
Nepal	NPL	South Asia	Low income
Netherlands	NLD	_	High income OECD
New Zealand	NZL	_	High income OECD
Niger	NER	Sub-Saharan Africa	Low income
Nigeria	NGA	Sub-Saharan Africa	Low income
Norway	NOR	_	High income OECD
Panama	PAN	Latin America & Caribbean	Upper middle income
Peru	PER	Latin America & Caribbean	Lower middle income
Philippines	PHL	East Asia & Pacific	Lower middle income
Poland	POL	Europe & Central Asia	Upper middle income
Portugal	PRT	_	High income OECD
Puerto Rico	PRI	_	High income non OECD
Russian Federation	RUS	Europe & Central Asia	Lower middle income
Slovak Republic	SVK	Europe & Central Asia	Upper middle income
Slovenia	SVN	_	High income OECD
South Africa	ZAF	Sub-Saharan Africa	Lower middle income
Spain	ESP	_	High income OECD
Sweden	SWE	_	High income OECD
Switzerland	CHE	_	High income OECD
Thailand	THA	East Asia & Pacific	Lower middle income
Uganda	UGA	Sub-Saharan Africa	Low income
Ukraine	UKR	Europe & Central Asia	Lower middle income
United Kingdom	GBR	_	High income OECD
United States	USA	_	High income OECD
Uruguay	URY	Latin America & Caribbean	Upper middle income
Vanuatu	VUT	East Asia & Pacific	Lower middle income
Venezuela, RB	VEN	Latin America & Caribbean	Upper middle income
Vietnam	VNM	East Asia & Pacific	Low income

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