

# Summary of workshop results

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## I. Community wetland management

Suyanto from ICRAF presented *CIFOR-ICRAF research* on community fire management and impacts in the wetlands of southern Sumatra. Fire is an important community wetland management tool. Burning is not controlled and widespread, repeated fires have transformed the landscape from mature high swamp forests to fire-adapted *Gelam* (*Melaleuca cajuputi*) forests, open savannas and grasslands. Large-scale developments such as commercial logging, building canals, draining and transmigration projects have contributed to the spread of fire-based land management.

Local communities extract fish, wood and other resources from the wetlands. Fire is used in the course of these activities to enable access to the resource and ease camping in the wetlands. With the depletion of commercial timber, the communities harvest the lower-value *Gelam*. They also cultivate swamp rice (*sonor*) in the wetlands in long drought years, using fire to clear the land and provide nutrients for the crops. The *sonor* system and fire use has expanded and intensified in recent years following degradation of the swamp forests through logging and the increased frequency of long drought periods. Paddy yields are significantly high and *sonor* is currently a major source of income in drought years. The decline in fish and high-value timber resources has, however, led to falling incomes and fewer livelihood options. Workers now migrate into neighbouring forests to extract resources. Baharudin, a *local community representative* from the study site, Air Sugihan, confirmed that livelihood options were very limited in the swamps and fire use was critical.

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Djoko Setijono from the *Bilateral South Sumatra Forest Fire Management Project* (SSFFMP) in Palembang also confirmed that villagers use fire for fishing and swamp rice cultivation in the wetlands. Swamp fire use is not based on any sustainable traditional practice. Active participation of the communities is required to resolve the peatland fire problem and this is the approach being developed by the SSFFMP project for South Sumatra. Given the importance of fire for the local economy, ways to regulate burning would be explored including building canals as fire breaks. Also, alternative livelihood opportunities to reduce fire use would be identified. Joko Kiswanto from *Dinas Kehutanan Jambi* objected to building canals as fire breaks as they would tend to drain the peatlands.

Ahmad Samodra from *LPHPEM (an NGO)* suggested that communities were unaware of long-term conservation needs. However, Wilistra Danny from the *Ministry of Forestry, Jakarta* indicated that it was normal for the communities to prioritize their livelihood needs over long-term resource conservation. He felt it was important to increase local awareness about the environment, and strengthen local institutions and regulations to reduce the fire problem. Suyanto from ICRAF responded that there was a trade-off between local and global interests and resolving this conflict may require providing incentives to communities for sustainable practices.

Hasanuddin from *Dinas Kehutanan South Sumatra* noted that fire was formerly viewed as a forestry sector problem but the importance of community perception and participation is increasingly being recognized. South Sumatra contains vast areas of highly fire prone wetlands which have been severely affected by frequent widespread fires in the last two decades. There is no quick way to resolve the peatland fire problem as it requires finding alternative livelihood options and altering community behaviour. The department is actively promoting community-based fire management in the province with technical assistance from the SSFFMP project.

Idris Sardi from the *NGO Yayasan Prakasa Mandiri*, Jambi was concerned that communities appeared to be getting an unfair share of the blame. He asserted that company activities on wetlands were major sources of fire.

Summarized below are the key issues and recommendations for solving the problem fires related to community wetland management. These arise out of the papers, talk show and group discussion highlighting the perspectives of the key stakeholders - Community (Comm), government agencies (Govt), NGOs, research and development agencies (Res/Dev).

KEY ISSUES/CONCERNS	Comm	Govt	NGO	Res/Dev
1. Fire important tool for community wetland use and livelihoods	X	X	X	X
2. Burning is not controlled. Swamp fire use is not based on any sustainable traditional practice	X			X
3. No alternative yet for land clearing without fire for the communities	X	X	X	X
4. Limited economic opportunities, declining income	X	X	X	X
5. Long-term negative impacts of forest fires on resources and livelihoods	X		X	X
6. Tradeoff between local stakeholder livelihood needs and long-term conservation needs		X	X	X
7. More authority being given to big companies to use forest land, community has no incentive to control forest fire	X		X	
8. Large-scale plantation and forestry operations changed local cultures and management practices			X	
9. Different stakeholders have different opinions about the wisdom of community fire management practices	GROUP*			

\*GROUP - from group discussions

RECOMMENDATIONS	Comm	Govt	NGO	RES
1. Identify and promote integrated and sustainable peatland agricultural system	GROUP			
2. Sustainable livelihood options for communities that reduce fire use	X	X	X	X
3. Identify and promote technically and socially feasible fire management practices	GROUP			
4. Involve and strengthen community-based institutions for fire management	GROUP			
5. Enhance community awareness of long-term resource conservation needs		X	X	
6. Provide incentives to communities for sustainable practices				X
7. Government and private companies to develop plantations in partnership with communities	GROUP			
8. Promote dialogue between different stakeholders and use local community wisdom as a basis for fire management	GROUP			
9. Forest rehabilitation upstream to downstream	GROUP			

## II. Plantation development and management

With dryland areas already extensively developed, the wetlands of Sumatra are increasingly the focus of economic activities, including large-scale forestry and oil palm plantations, particularly in Riau and North Sumatra. The companies believe that the peatlands are suitable for large-scale tree plantations because they are vast and largely uninhabited, with few land claims, unlike the dryland areas. Forestry plantation companies such as PT Arara Abadi and PT Riau Andalan Pulp and Paper (RAPP) are in the lead in terms of forestry plantation development on peat.

Darjono from *BAPEDAL Riau Province* spoke about the legislation and enforcement regarding fires in timber and estate crop plantation concessions. From 1997 to 2001, 51255 ha were burnt in Riau, of which 33000 ha were in timber and estate crop plantation lands. From 1995-2003, 49 companies were investigated for using fire in land clearing operations. Only two of these companies were finally convicted. The zero burning law is difficult to enforce because of the vastness and remoteness of the wetland concessions, limited resources and expertise, lack of company cooperation and lack of field insurance for the investigators.

Olle Wennstrom from *PT Arara Abadi* stated that between 2002 and 2003, the area affected by fires within their concessions had reduced from 12500 to 600 ha. He acknowledged that a wetter year was a factor in fire reduction, but a significant role was played by their increased fire fighting capacity, fire prevention and community extension programs. He was confident of their full capacity to fight and manage peatland fires. They have a strict no-burn policy enforced by agreement with all contractors working in their area. They try to help the communities on the concession boundaries to implement zero burning or controlled burning measures in their agricultural land clearing operations. They also work with the local government to handle illegal logging operations within their concession. Pt Arara Abadi, PT RAPP and four other companies have formed a Haze Prevention Group.

Eliezer Lorenzo from *PT RAPP* talked about the lack of available drylands and the resulting increase in pressure on the vast peatland areas for development of timber and estate crops and local agriculture. Meanwhile the peatlands were also being degraded through illegal logging, fire use and improper drainage systems. So far there has been no clear penalty for the companies charged with violating the zero burning law passed in 1997. PT RAPP has a strict no-burn policy enforced since 1994 and believes in sustainable wetland development. So far they have planted 50000 ha of the 70000 ha allocated for development on the peatlands. Forest plantation development on peatland involves a lot of challenges in terms of minimizing peat subsidence, land clearing without fire, reducing fire risks, and protecting against fires originating on the concession boundaries. Also *Acacia* plantations need dry conditions and thus water management is critical. They are also involved in community extension activities as part of the fire prevention and awareness building program.

Questions were raised by Indra Arinal of *Wetlands International* and Hari Subagyo of *PT Putra Duta Indah Wood* regarding the appropriateness of trying to grow dryland species such as *Acacia* on wetlands given all the associated risks of massive environmental degradation. They asserted that it may be better to protect the natural forests for their conservation value on wetlands, and establish forest plantations on drylands in partnership with local communities. Also, a question was raised about increasing access and fire hazards through canals developed for the plantations. Eliezer Lorenzo from *PT RAPP* responded that *Acacia* was growing quite well on

their wetland concession and that the canals were not connected to the rivers, thus limiting access. He stated that wetland development policies originated from the government and not from the companies. The policy was aimed at agricultural development and poverty alleviation. Population and degradation pressures are increasing and the wetlands have to be used, preferably in a sustainable manner. Eliezer argued that timber plantations would be a more favourable option for peatland development than annual agriculture or estate crop development since they provide more efficient carbon sinks and require less nutrients. They also cause less peat subsidence than annual cultivation.

Rully Syumanda of the *NGO, WALHI* from Riau stated that since 1995, industry has been using slash and burn practices to convert land to estate crop and timber plantations in Riau. In addition massive exploitation of the forests, since the 1980s, had left them in a degraded condition and increased their flammability. He suggested that the reasons behind the widespread forest degradation are government policies that allow large-scale conversion, granting of timber utilization permits to companies, global demand for palm oil, and the overcapacity of the pulp and plywood industry. With regional autonomy, the local government has focused on rapid exploitation of the forest resource, with no concern for local livelihoods and the environment. No strong punitive action has been taken against the violators of the zero burning law. Also, the burn prohibition can be bypassed with special permits from the authorities. There is a need for clear and strong disincentives to companies who violate the zero burning laws and incentives for companies who abide by it.

Bandono Suharto from *Dinas Perkebunan Riau Province* stated that Riau had multiple fire spots, the monitoring of which takes up a lot of time. Peatlands are very vulnerable to fire and difficult to access. They had limited facilities, equipment and funds to deal with the peatland fire problem. About 390,000 ha of wetlands in Riau was reserved for development into estate crops. Regulations regarding conversion of forest areas to estate crops are in the hands of the Ministry of Forestry.

Summarized below are the key issues and recommendations for solving the problem fires related to plantation development and management on wetlands. These arise out of the papers, talk show and group discussion highlighting the perspectives of the key stakeholders - forestry plantation companies (HTI), government agencies (Govt), NGOs, and researchers (Res).

KEY ISSUES/CONCERNS	HTI	Govt	NGO	Res
1. Large peatland areas now under development focus. Need clarifications on land use allocation for conservation and development, and the scientific basis for the regulations	X	X	X	X
2. Need clarifications on land tenure - community versus industry to prevent conflicts and degradation			X	
3. High fire risks - draining and development degrades the peatlands and brings people into the area			X	X
4. High cost and difficulties of water, soil and fire management in the peatlands	X			X
5. Because of big failures in the past, lots of doubts about sustainability of peatland development			X	X
6. Lack of timely information on fire locations. Limited resources and expertise for responsible government authorities		X		
7. Decentralisation of natural resource management not matched by adequate local government capacity	GROUP*			
8. Weak law enforcement and support of zero burning.	GROUP			
9. Community land clearing fires on boundaries of plantations, with limited capacity of community to manage fire	X			
10. Impoverished communities on the margins of the plantations with no access to capital, resources, alternative livelihood options or profits from plantations	GROUP			

\*GROUP - from group discussions

RECOMMENDATIONS	HTI	Govt	NGO	Res
1. Review and audit existing peatland use allocation for development/conservation including all stakeholders. Review scientific management basis of regulations				GROUP
2. Promote capacity and political will to use available information technology to tackle the fire problem speedily				GROUP
3. Strengthen the capacity and commitment of local government agencies to work towards sustainable wetland use and conservation				GROUP
4. Increase international pressures and strengthen government staff capacity to enforce current zero burning laws. Provide incentives for not burning				GROUP
5. Learn from and promote best management practices for peatland development				GROUP
6. Programs to improve community welfare				GROUP
7. Government and companies to support communities in their agricultural fire management practices to prevent escapes				GROUP

### III. Remaining natural forest areas (production and protection forest)

The high swamp forests that once covered the majority of the wetlands (including peatlands) of Sumatra have been reduced to a few remote sections and scattered fragments. Commercial logging, large-scale wetland reclamation for transmigration and plantation development, as well as livelihood pressures have been important factors in this transformation from the late 1960s to present. The last remaining large sections of high swamp forest are in the province of Riau, and in the Berbak-Sembilang Conservation area and surrounding timber concessions in Jambi and South Sumatra.

These remaining forests are at high risk from fires. Peat forest burning results in peat degradation, acidification of water, increase in flammability, substantial haze and carbon emissions, and loss of forest products and biodiversity. Once degraded and subject to continuous high human pressures, peat forests are difficult to regenerate.

The peat swamp forests of Berbak National Park and neighbouring timber concession, PT Putra Duta Indah Wood in Jambi have been subject to repeated burning in the last decade, most extensively in the 1997 drought. Andri Ginson of *Berbak National Park* and Hari Subagyo of *PT Putra Duta Indah Wood* indicated that the forest fires are associated with logging activities (both by concession staff and illegal loggers), NTFP and fish extraction, agricultural encroachment, and agricultural fires spreading from the forest boundaries. Fire is an invaluable tool, in both agriculture and in the course of logging and hunting in the inhospitable swamp forests. At present, they have no alternative land clearing methods to promote to the communities. Improper swamp management, primarily the building of canals also plays a critical role in fire incidence.

Fire prevention and suppression systems are in place but fires are difficult to locate, reach and extinguish in the inaccessible, easily flammable peatlands. Managers also suffer from a lack of equipment and resources for the task as well as timely information on fire locations. They have done some community extension work, such as awareness campaigns, but they need to take care of the underlying causes of the fires in order to be effective - i.e. reduce uncontrolled burning and reasons for community entry into the forest. This requires improving local livelihoods, rehabilitating the degraded forests, identifying and promoting controlled burning and zero burning methods, and involving communities in fire management.

*Forest managers* and *NGOs* suggest that forest fire problems have increased following decentralization and conflicts between central and local land allocations. Other *NGO* representatives add that institutional capacity and commitment to fight the forest fires is low and there are no standard guidelines for use. Burnt forests, on occasion, were inappropriately handed over for plantation forestry development.

*Communities* perceive state control of the forests as inequitable and have no incentives to protect them from fire. Sakimin and Edy Candra, local community representatives near Berbak National Park say that paddy yield on drained peatland is low, livelihood options are limited and people are forced go into the peat forests. The communities use fire for clearing land to plant estate crops and paddy since it is the cheapest and easiest way. The fires cause health problems and soil fertility

declines over time. Also, the farm fires often spread into the forests given their degraded condition and communities' lack of awareness about fire control. They suggest improving the local economy, promoting controlled burning and local regulations for fire use, and involving local people in fire control activities. Alternatives to burning such as gathering debris and allowing it to decay on site, as nutrients for the crops could be explored. They are prepared to help protect against forest fires but lack infrastructure, tools, and timely aid. There was also a need for forest and peat rehabilitation and improved water management in drained areas.

Rivani Noor of the *NGO WALHI-Jambi* stated that fire use is not all bad, as some communities practice traditional fire management. He suggested that illegal logging, large-scale draining and land conversion using fires in the swamps and lack of law enforcement were the key problems. Fire risks need to be taken into account in development policies. Community participation in policy making and fire control is essential to sustainably manage the peatlands. Satya Ismunandar from *PT RAPP*, however, indicated that traditional practices and regulations may be breaking down with large-scale socio-economic transformations and need to be readjusted. There was an overall need to increase expertise in peatland fire management among all stakeholders.

Irwansyah Reza Lubis of *Wetlands International* indicated that burned areas need assisted rehabilitation to reduce their flammability and speed up the recovery process. The best way to achieve this is through community-based integrated management, involving all the stakeholders from bottom up. This strategy is being pursued by the Canadian-funded project "Climate Change, Forest and Peatlands in Indonesia" in Berbak-Sembilang Conservation Area, where *Wetlands-International* is working with the villagers, PT Putra Duta Indah Wood, and the National Park office. They will work to rehabilitate the burned forests, close inappropriate canals, provide alternative incomes, and limit community activities in the peat swamp forests. Attention is also paid to the development of local institutions, conservation management plans, environmental awareness, funds and rewards for communities, clear land ownership, and community-based fire patrols and suppression.

Summarized below are the key issues and recommendations for solving the problem fires related to the remaining natural forest areas. These arise out of the papers, talk show and group discussion highlighting the perspectives of the key stakeholders - local and transmigrant communities (Comm), government agencies (Govt), forest concession company (HPH), NGOs.

KEY ISSUES/CONCERNS	Comm	Govt	HPH	NGO
1. Forest fire problems from illegal logging, encroachment, and bordering agricultural fires		X	X	X
2. Fire use is critical for communities, no alternatives in sight	X	X	X	X
3. Low agricultural yields and poverty leading to local dependence on forest resources	X	X	X	X
4. Local rights and access to state forest limited - so local apathy to forest fires	GROUP*			
5. Socio-economic and ecological changes and breakdown of traditional management practices	GROUP			
6. Forest degradation and increased flammability with logging	GROUP			
7. Difficult to control peatland fires - access and other problems		X	X	X
8. Insufficient resources, information and expertise for fire management among all stakeholders		X		X
9. Existing institutions in charge of fire management not effective and responsible, and no standard operating guidelines to solve the forest fire problem				X
10. Decentralisation implementation resulted in increased forest fires		X		X

\*GROUP - from group discussions

RECOMMENDATIONS	Comm	Govt	HPH	NGO
1. Livelihood development projects	X	X	X	X
2. Alternative land clearing methods	X	X	X	
3. Involve local people and their traditional knowledge in fire control activities	GROUP			
4. Develop equitable partnerships between government/ companies and community in wetland development	GROUP			
5. Sustainable logging procedures to reduce fire hazard	GROUP			
6. Forest rehabilitation and closure of canals		X		X
7. Provision of equipment, resources and funds to fight fires in a timely manner	X	X		
8. Specific recommendations for fire detection, monitoring and suppression			X	
9. Strengthen existing institutions for fire management				X
10. Clarify procedures for solving the fire problem at different government levels	GROUP			
11. Review decentralisation policies and role in fires		X		X

## IV. Transmigration settlement and agricultural development

Up to 1994, 3.3 million ha of wetlands in Sumatra, Kalimantan and Sulawesi were drained and reclaimed for transmigration or resettlement of people from the crowded islands of Java, Bali and Madura. About 1.6 million households were resettled on the wetlands. Plots of 2-3 ha per household were assigned for permanent crop cultivation and settlement. The land was prepared for agriculture through logging, draining and burning. Rice is the main crop cultivated. Agroforestry crops such as coffee and coconuts are also grown.

In South Sumatra alone, 320673 ha were reclaimed from 1969 to 1988 with 54671 households resettled on these sites. Anton Sugianto, the *community representative* from the Air Sugihan Kanan transmigration area, OKI, South Sumatra discussed the difficulties with agriculture on the drained swamps. Problems included lack of water in the dry season, pest infestations, low soil fertility and high acidity. They do not have funds for the kind of site management and inputs required to cultivate on the swamps. Fire use was critical for annual cultivation, to provide nutrients for the crops and get rid of the weedy vegetation. Herbicides were not as effective as fire use.

From 1981 to 1990, rice yields were satisfactory. But since the forest fires of 1991, 1994 and 1997, there have been serious problems with rice cultivation. The researchers in the group suggested that the declining yields are probably due to reduced fertility over time with frequent burning. Also, agricultural land abandoned by many transmigrants was a source of pest invasion.

With the failure of agriculture, many transmigrants have left. Others have taken to *sonor*, *Gelam* extraction, and informal logging in neighbouring forest areas. The transmigrants are looking at tree crops like coconut and oil palm to help improve their livelihoods. Plans to develop such tree cropping funded by local investors already exist in the area. The community has also developed regulations for agricultural burning to prevent fire escapes. Anton asserted that farm fires were not the source of the forest fires of 1991, 1994 and 1997.

From the *research perspective* (Robiyanto Susanto), annual burning in the drained transmigration area leads to peat subsidence and decreases long-term nutrient content. But at the same time, it helps clear the vegetation cheaply and conveniently, provides ash for the crops, neutralizes the acidity, brings the minerals soil closer to the surface and provides a better rooting zone. The transmigrants do not have many alternative livelihood options. The adjacent peat forest was also the water catchment area for Air Sugihan Kanan, and burning and alteration of the hydrological structure there affected the water quality and quantity in the transmigration area.

Developing new transmigration projects in the swamps is not a good idea. A lot of such developments have failed because of peat subsidence, difficulties with water management, acid sulphate conditions and low fertility. Draining also increases flammability drastically. In long drought years, farm fires on drained peat can lead to widespread destructive fires.

In existing transmigration sites, branching out to tree crops might be a good idea. Local tree species, coconut and oil palm are preferable to planting *Acacia* sp. The deep-rooting dryland *Acacia* sp. require considerable drainage, are not very productive and increase fire risks. Shallow-rooted oil palm which can also withstand longer

flooding is preferable, but large-scale expensive operations are required for economic success and may be out of the reach of smallholders.

According to Ahmed Zuber, *Dinas Transmigrasi*, South Sumatra, the problems with transmigration development is really one of poor implementation of policies on the ground and uncoordinated efforts. Burning for land clearance in transmigration areas is now forbidden. The current problems on existing sites have to be fixed.

*The NGO participants* suggested that more research was required on peatland agriculture and sustainable development options, including the land compatibility for different crops. They believe tree crops such as oil palm and coconut could work, based on past experience in the area. Market development would be required.

Summarized below are the key issues and recommendations for solving the problem fires related to transmigration settlements and livelihood practices. These arise out of the papers, talk show and group discussion highlighting the perspectives of the key stakeholders - Transmigrants (Trans), government agencies (Govt), researchers (Res), NGOs.

KEY ISSUES/CONCERNS	Trans	Govt	Res	NGO
1. Rice cultivation is not a suitable practice on drained wetlands (yields declining and lands being abandoned)	X		X	X
2. Fire use is a must for cultivation by farmers	X		X	
3. Agricultural fire use has both positive and negative impacts			X	
4. Drainage increases fire risk	X		X	
5. Adjacent peat forest fires (water catchment area) negatively impact on transmigrant lands and agriculture	X		X	
6. Implementation problems with transmigration land use procedures (does not match field situation)		X		
7. Transmigrants adopt local practices (including fire-based <i>sonor</i> ) with agricultural failure	GROUP*			
8. Poor infrastructural development and district government (with decentralization) not ready to deal with transmigration site problems	GROUP			
9. No local institution or resources to deal with forest fire problem	GROUP			

\*GROUP - from group discussions

RECOMMENDATIONS	Trans	Govt	Res	NGO
1. Shift from annual to estate crops/agroforestry (in partnership with companies) to improve livelihoods and avoid annual burning	X		X	X
2. Appropriate tree crops should be chosen			X	X
3. Do not develop new transmigrant areas in the swamps			X	X
4. Government and others to support infrastructure, plantation and livelihood development in the villages	X			
5. Review the canal development and water management problems	GROUP			
6. Incentives and funds from Central to District governments to maintain and improve transmigration area	GROUP			
7. Extension work to discourage sonor and fire use	GROUP			
8. Regulate fire use for agricultural land clearing - to avoid destructive fires	GROUP			
9. Create local fire control institution/systems	GROUP			

## V. Summary of key fire issues and concerns in wetlands of Sumatra

- Swamp forest degradation and increased flammability with logging, draining, development and increased populations.
- Many doubts about sustainability of peatland development for large-scale plantations and agriculture because of big failures in the past. Fire risks very high. Difficulties with water, soil and fire management. Rice cultivation not a suitable practice on drained wetlands. Doubts about sustainability of *Acacia* plantation development on wetlands as well.
- Large peatland areas are now under development focus. Need clarifications on land use allocation for conservation and development, and the scientific basis of the regulations.
- Weak law enforcement and support of zero burning for companies.
- Fire use is critical for communities in all settings and activities in the wetlands and there are no alternatives to fire use in sight. Burning is not controlled and swamp fire use is not based on any sustainable traditional practice. Fire-based land management is intensifying with landscape degradation and population pressures.
- Impoverished communities inhabit the marginal swamps with limited access to capital, high-value resources, sustainable livelihood options and profits from large-scale plantations. Agricultural yields are low and they depend on remaining

swamp forest resources for their livelihoods, irrespective of tenure status of the land. Forest fire problems arise from logging activities (both by concession staff and communities), encroachment and bordering agricultural fires.

- Tradeoffs exist between immediate local livelihood needs, and long-term and global conservation needs.
- Questions arose about state ownership of forest lands and greater authority and rights given to companies with no concern for community needs.
- Difficult to control peatland fires because of access and other problems. Insufficient resources, information and expertise for fire management among all stakeholders. Existing institutions in charge of fire management are not effective and responsible, and there are no standard operating guidelines. No local institutions or resources to deal with forest fire problem.
- Decentralisation implementation resulted in increased forest fires.

## **VI. Key recommendations to resolve the wetland fire problem in Sumatra**

- Review and audit existing use allocation for peatland development versus conservation including all stakeholders. Review scientific management basis of regulations. Do not develop new transmigrant areas in the swamps.
- Learn from and promote best management practices for peatland development. Review the canal development and water management problems. Sustainable logging procedures to reduce fire hazard.
- Close canals, rehabilitate forests
- Increase international pressures and strengthen government staff capacity to enforce current zero burning laws for companies. Provide incentives for not burning.
- Government and companies to support communities in their agricultural fire management practices to prevent escapes. Identify and promote feasible alternative land clearing methods.
- Sustainable livelihood options for communities that reduce fire use. Develop equitable partnerships between government/companies and community in wetland development. Shift from annual to estate crops/agroforestry (in partnership with companies) to improve livelihoods and avoid annual burning. Appropriate tree crops should be chosen.
- Need clarifications on land tenure - community, state and industry - to promote sustainable wetland management.
- Involve communities in resource and fire management and increase their environmental awareness. Provide socio-economic incentives to communities for sustainable wetland management. Create and strengthen local institutions and regulations for fire management.

- Strengthen existing institutions and clarify procedures for solving the fire problem at different government levels. Provide equipment, resources, information and funds to fight fires in a timely manner.
- Review decentralisation policies and role in fires. Strengthen the capacity and commitment of local government agencies to work towards sustainable wetland use and conservation. Incentives and funds from Central to District governments to maintain and improve transmigration area.

## VII. Follow up

Participants expressed interest in pursuing the following recommendations.

### a. Landscape policy review for peatland development versus conservation

Isdarma, ST, Bappeda Kab. Musi Banyuasin, South Sumatra  
 Ir. Belly Pahlupi, Bappeda Lampung Province  
 Rivani Noor, NGO WALHI, Jambi  
 Susi Aengraeni, NGO KALIPTRA, Riau  
 Rini Armeini, NGO LPH-PEM, Palembang  
 Eliezer Lorenzo, PT Riau Andalan Pulp and Paper

### b. Improving community livelihoods and welfare

Transmigration

Mahnizar, Dinas Perikanan dan Kelautan, Kab. Musi Banyuasin, South Sumatra  
 Prehanto, Transmigration Farmer, Air Sugihan, South Sumatra - oil palm  
 Anton Sugianto, Transmigration Farmer, Air Sugihan, South Sumatra

General

Edy Candra, Local farmer, Jambi  
 Sakimin, Local farmer, Jambi  
 Zainal Abidin, Dinas Perkebunan Lampung Province  
 Deddy Permana, NGO Wahana Bumi Hijau, Palembang  
 Maslian, NGO Yayasan Pinse, Jambi  
 Wetlands International, Palembang  
 Noviana Khususiyah, ICRAF, Bogor  
 Suyanto, ICRAF, Bogor

### c. Community-based fire management

Andri Ginson, Berbak National Park, Jambi  
 Satya Ismunandar, PT Riau Andalan Pulp and Paper  
 Hairul, NGO Yayasan Pinse, Jambi  
 Maslian, NGO Yayasan Pinse, Jambi  
 Wetlands International, Palembang

### d. Community and public environmental awareness

Idris Sardi, NGO Yayasan Prakarsa Mandiri, Jambi  
 Rivani Noor, NGO WALHI, Jambi  
 Wetlands International, Palembang

### e. Local institutional strengthening

Sakimin, Local farmer, Jambi  
 Aidil Fitri, NGO WALHI, South Sumatra

- f. Sustainable forest management certification**  
Indra Arinal, Wetlands International, Palembang  
Hari Subagyo, PT Putra Duta Indah Wood
  
- g. Strengthening official fire detection and suppression capacity**  
Ir. Bando Suharto, Dinas Perkebunan Riau Province  
Hairul Sani, Dinas Kehutanan dan Perkebunan, Kab. Musi Banyuasin, South Sumatra  
Andri Ginson, Berbak National Park, Jambi  
Tri Prayogi, BKSDA, South Sumatra  
Zainal Abidin, Dinas Perkebunan, Lampung Province  
Satya Ismunandar, PT Riau Andalan Pulp and Paper
  
- h. Review role and performance of government agencies at different levels in dealing with the fire problem**  
NGO WALHI Riau  
NGO KALIPTRA, Riau