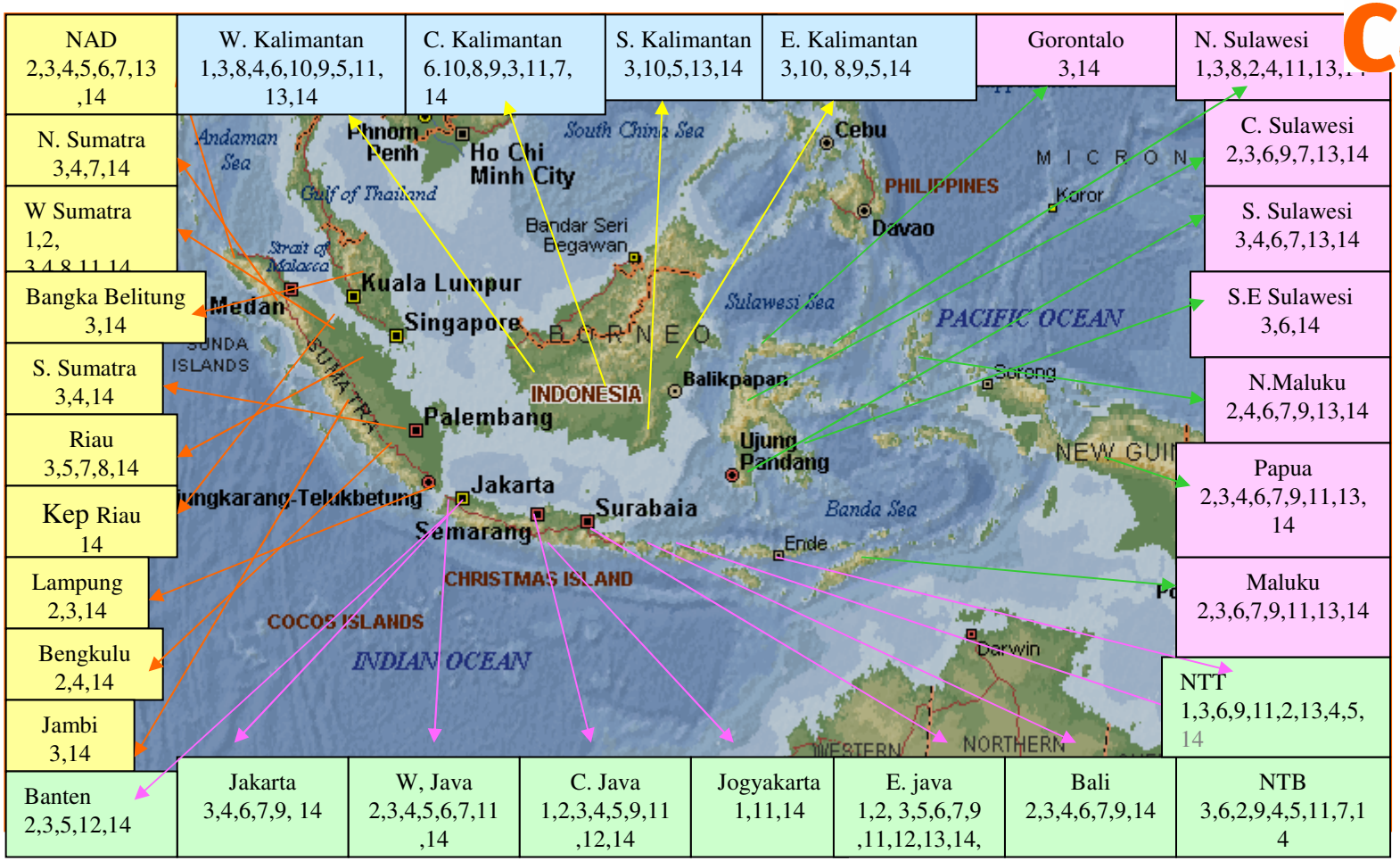
Climate Change Adaptation, Disaster Risk Reduction and Food Security

Kalimantan – Indonesia

By: Roelof van Til
CARE International

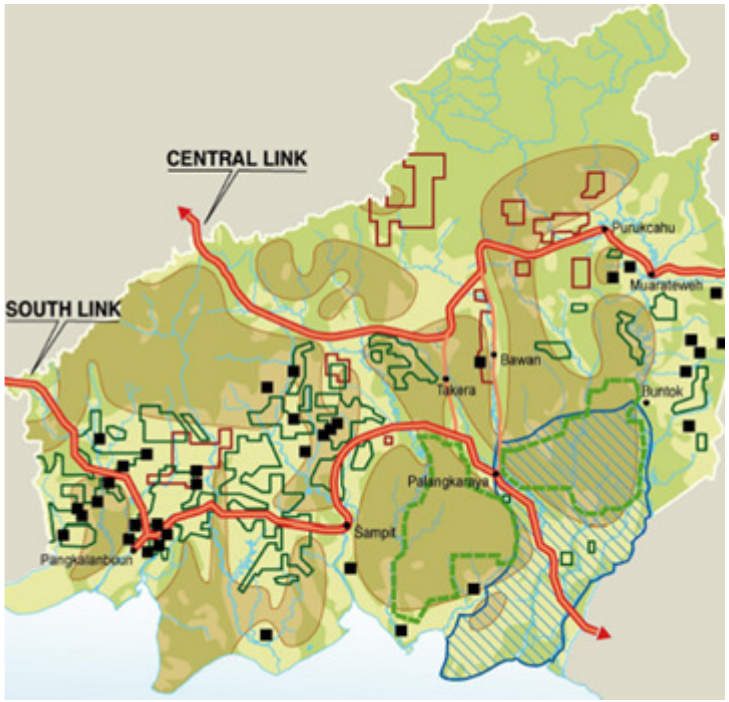
With thanks to: Johan Kieft – CARE Int. Indonesia

Hazard Map Indonesia

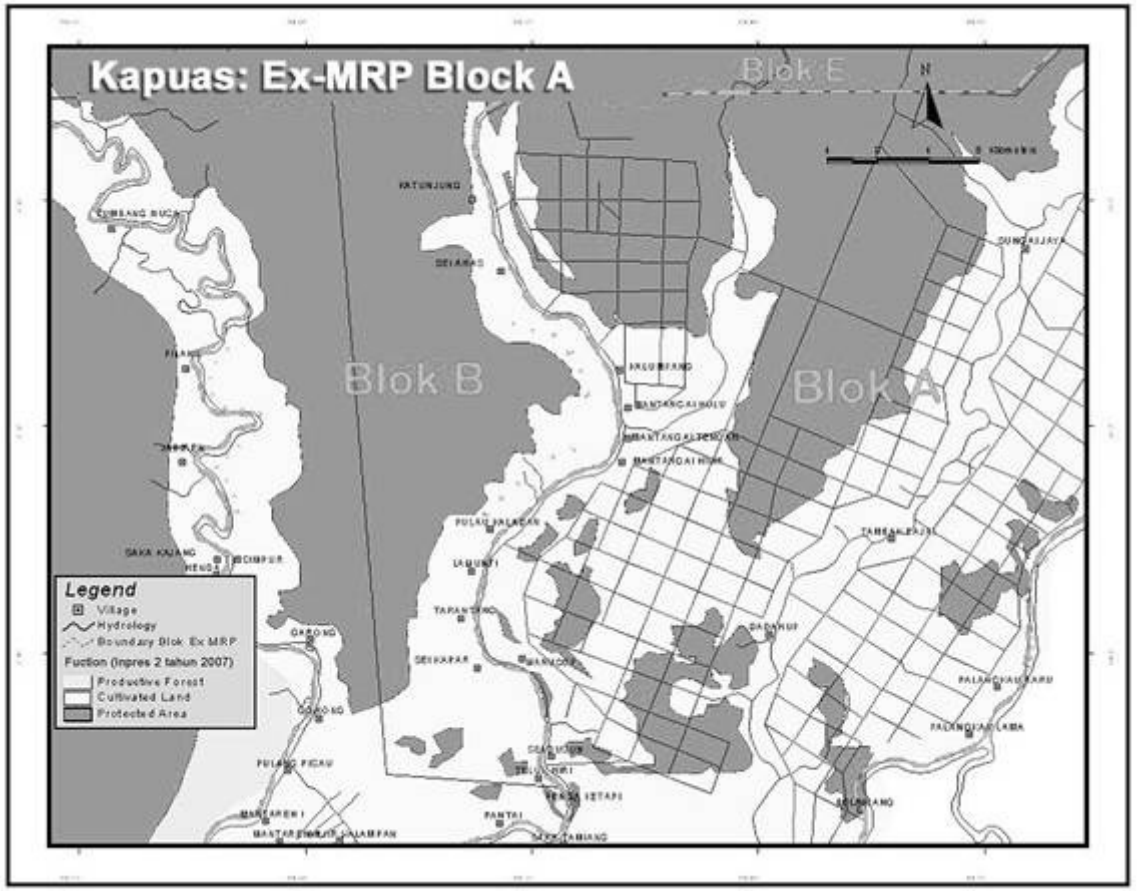


Type of Hazard

1.	Volcano	5. Hurricane		9. Disease outbreak		13. Tsunami	
2.	Earthquake	6. Conflict		10. Storm		14. Transportation Accident	
3.	Flooding	7. Terrorism		11. Drought			
4.	Landslide	8. Environmental Pollution		12. Industrial Accident			



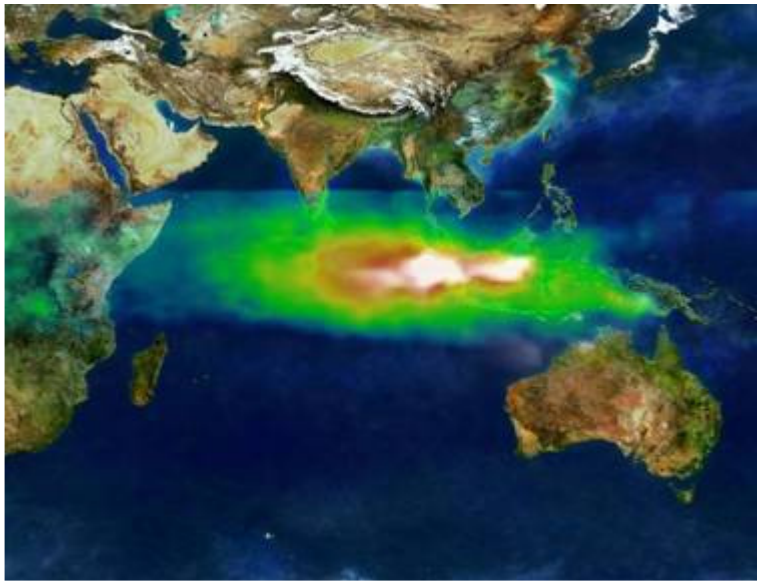
Picture: Wetlands International



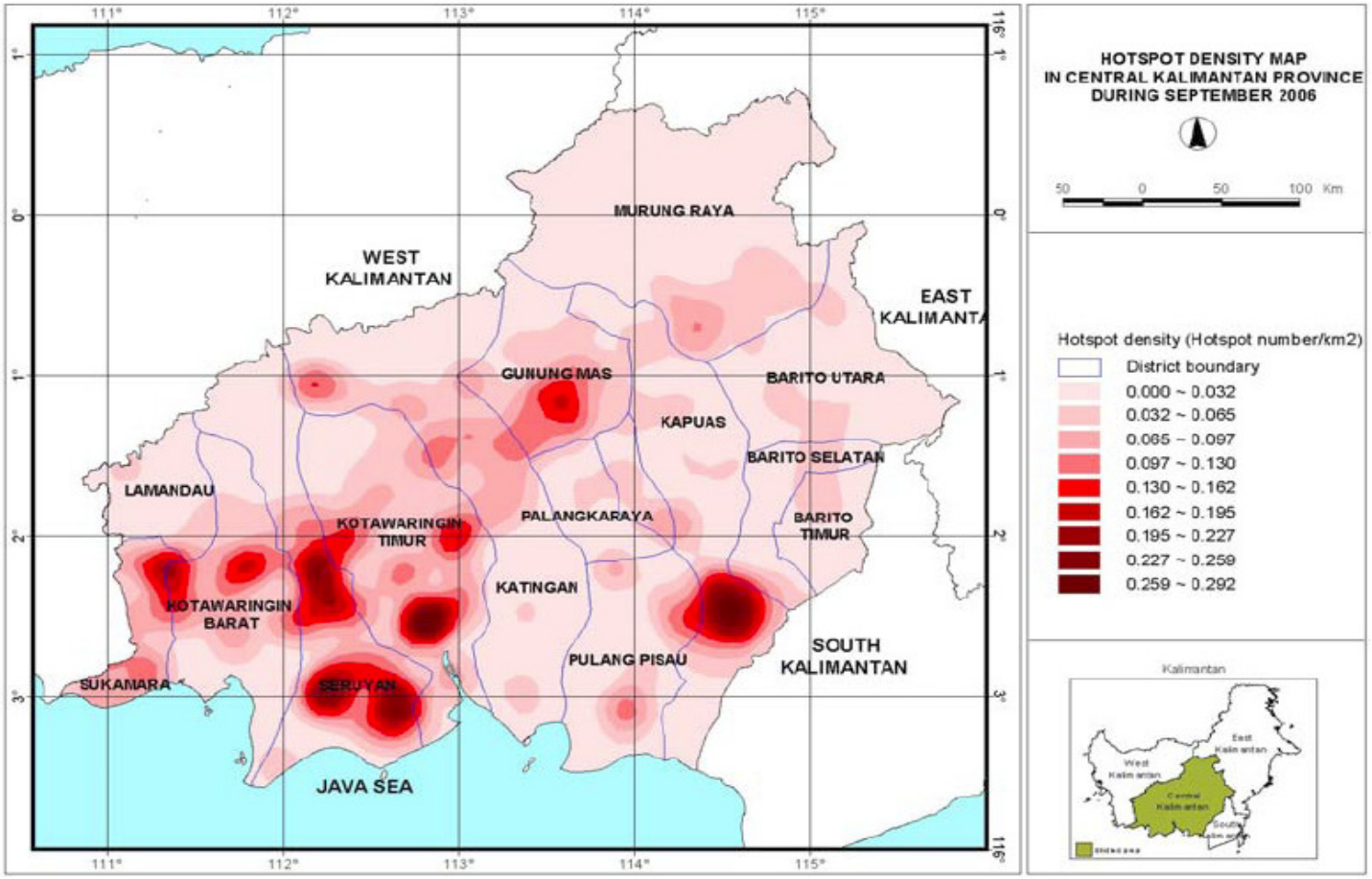
Picture: Wetlands International

Central Kalimantan: Peatlands

The Problem: peat fires



Peat Fires on Central Kalimantan



Picture: Wetlands International

Peat Fires - causes

- Badly-regulated **logging** degraded scrub- and grass-lands that are highly vulnerable to fire

- **Incineration** of weeds and crop residues

Picture: Wetlands International

Picture: Wetlands International

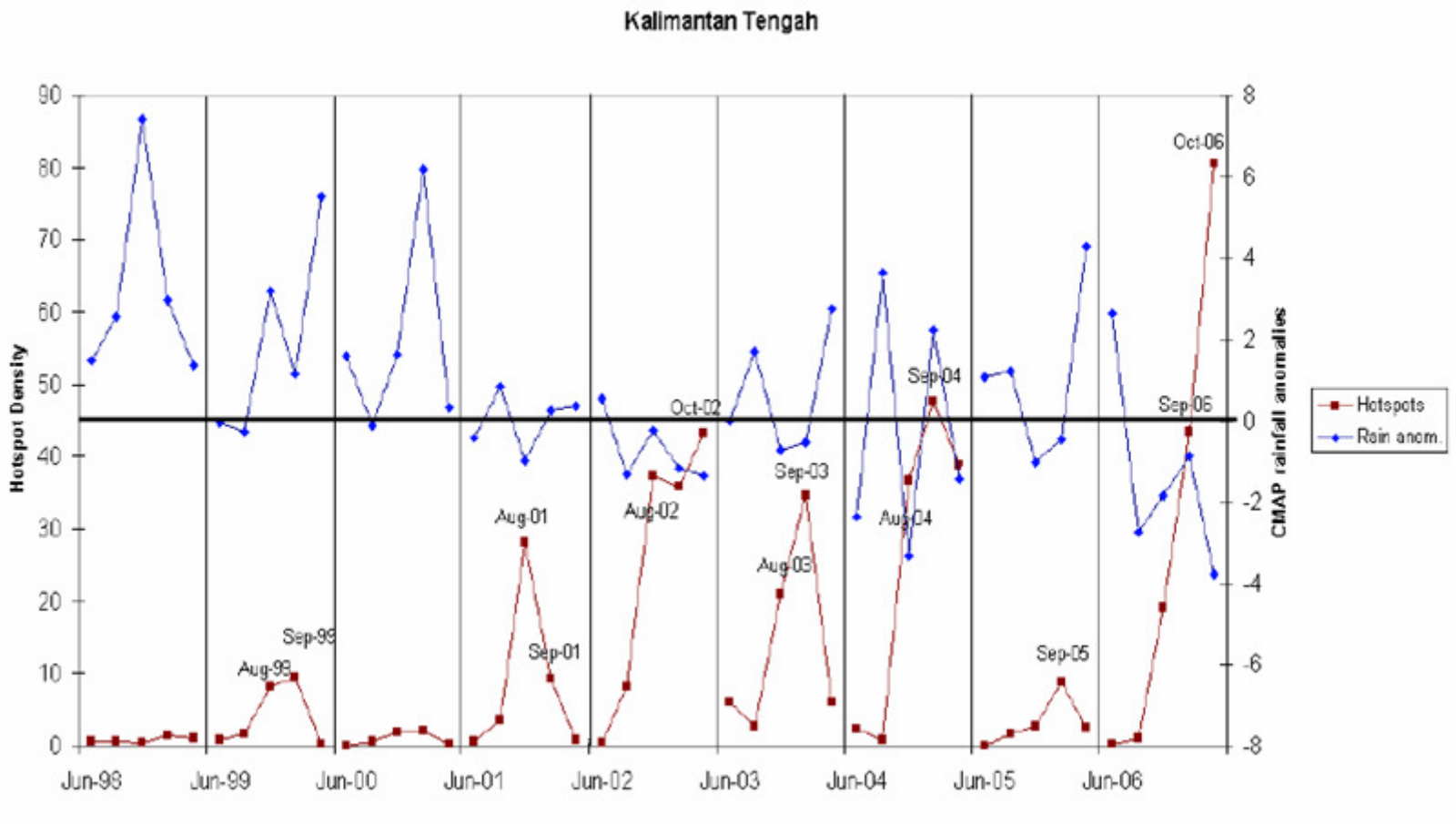
Peat Fires - causes

- **Drainage** of 1,400,000 ha, approximately 4400 km of canals and ditches were excavated (mid-90s): mega rice project

Picture: Wetlands International

Peat Fires - causes

- **Climate Change**



Peat Fires – Impacts

- Recurrent **destruction of livelihood assets**, up to 25% assets per year, particularly non-timber forest products, perennials and seasonal crops

Degree of damage	Pepper	Coconuts	Rubber	Fruits
0%	29%	49%	15%	45%
1-50%		7%	38%	11%
51-100%	71%	44%	47%	44%

Peat Fires – Impacts

- > 30% of under-5s suffer from **respiratory diseases and growth inhibition**

Picture: Wetlands International

Peat Fires – Impacts

- **Loss of agricultural options**: soil degradation (de-mineralisation, de-stabilization and acidification)
- **Loss of timber and other valuable forest products**

Picture: Wetlands International

Picture: Wetlands International

Peat Fires – Impacts

• **Increased risk of flooding.** Over-drainage caused irreversible changes to the peat soil, reducing its capacity to retain water. This has greatly increased the frequency and severity of flooding in the rainy season.

Coping strategies

1. Transiting to more fire tolerant annual crops
2. Accent on horticulture
3. Fresh water fisheries
4. Off farm employment

Blocking canals and No-Burning policies: opposition from the local communities

Dilemma:

Communities have come to rely for their livelihoods on the very infrastructure that drains peatland and increases risk of peat fires that burn crops and assets and threaten health

Burning weeds and crop residues facilitates farming

Picture: Wetlands International

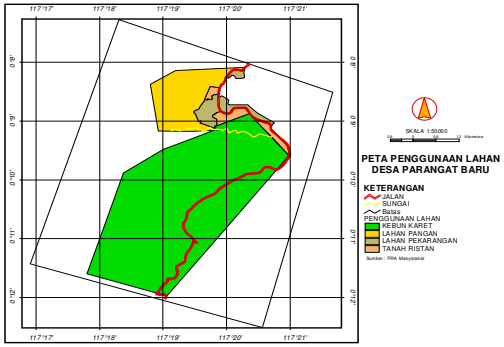
Community based Integrated Management of peat fires

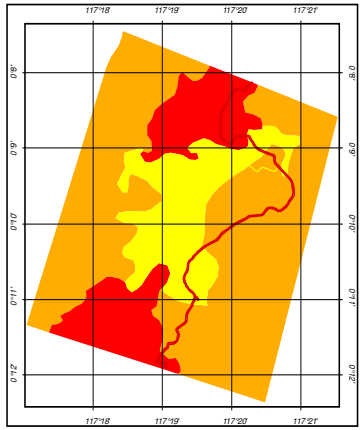
Conditions for success:

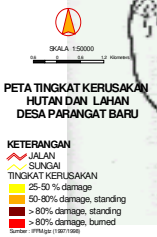
- Community-based identification of problems, decisions taking, planning and action (PRA, HVCA, …….)
- Adequate scientific, technical and financial support
- Tangible, positive short-, mid- and long term impacts

Community based Integrated Management of peat fires – Successful Components

- PRA, HCVA and Village Development Plans, integrated in decentralization processes
- Participatory Land Use Planning, including: settlement areas, forest conservation, agriculture, transport, fisheries, firebreaks, green belts







Community based Integrated Management of peat fires – Successful Components

- Integrating health and agricultural extension
- Design of simple water control structures, based on community plans

Picture: Wetlands International

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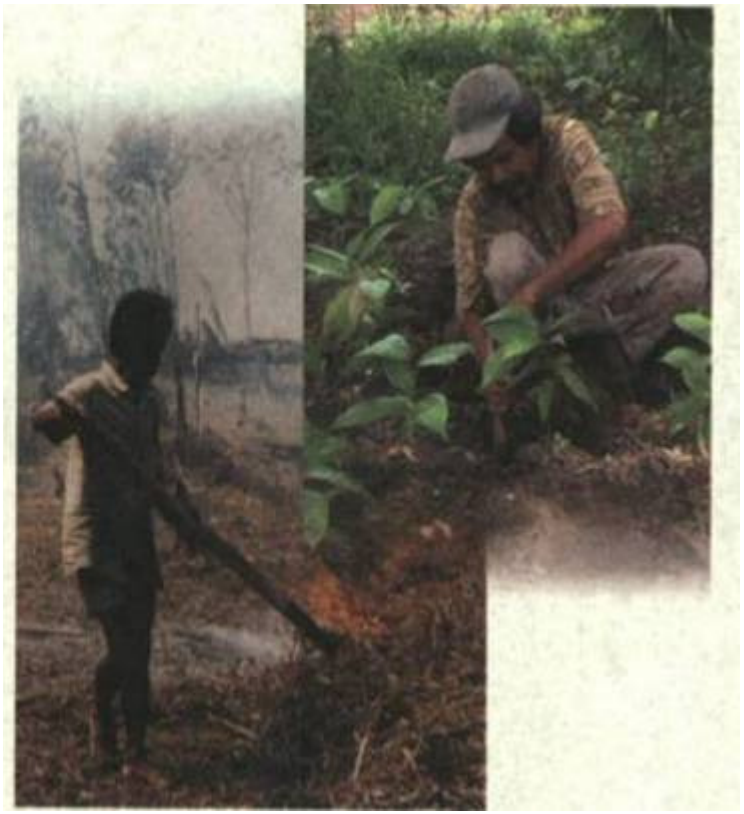
Community based Integrated Management of peat fires – Successful Components

Fire brigades

Community based Integrated Management of peat fires – Successful Components: agricultural adaptation

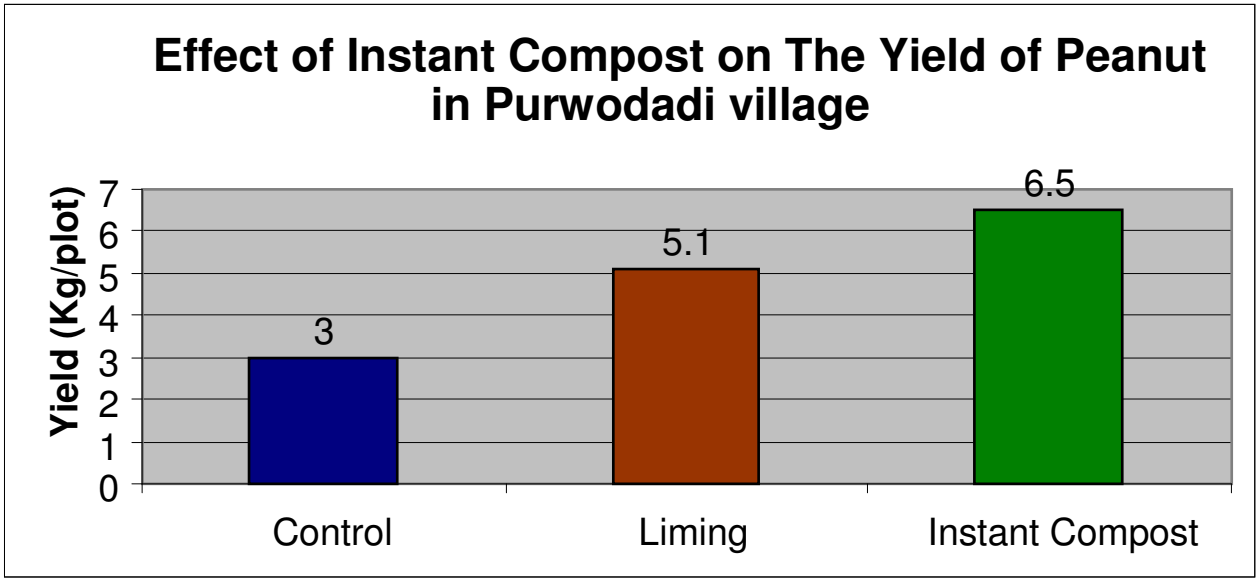


Improved “Jungle Rubber Systems”:

- Acid tolerant local rubber varieties selected by local farmers
- Experimentations with grafting of improved varieties on local root-stocks

Community based Integrated Management of peat fires – Successful Components: agricultural adaptation

- Use of “starter solutions” for decomposing organic materials: weed heaps and other slashed biomass do not need to be burned but enhance organic matter in the soil (“instant compost”). Result: better soil structure, less acid and more fertile. Also: no/less liming needed, cost saving



Community based Integrated Management of peat fires – Successful Components: agricultural adaptation

- Direct seeding in Mulch Cropping system (DMC, zero tillage) – most Imperata grass, systems further to be developed

Community based Integrated Management of peat fires – Successful Components: agricultural adaptation

	Frequency	% of experiments with technology	% of farmer who adopted the technology
Pest control			
1. Traps for rars and wild boar	106	6.1	76%
2. Pest and natural enemy monitoring	129	7.4	46%
3. Repellent crops	30	1.7	50%
4. Natural pest control (botanicals)	103	5.9	41%
	368	21.1	
Fertilization			
5.Mulching	91	5.2	36%
6.Dolomite (for acid soils)	1	0.1	100%
7. Liquid fertilizer	72	4.1	39%
8. In row tillage	111	6.4	69%
9. Composting with starting solution (EM4)	178	26.2	68%
10. Cover crop (LCC)	26	1.5	46%
11. Organic point fertilization (fertilizing with organic matter around planting hole)	1	0.1	100%
	480	43.6	
Improved cultivation/Tillage			
12. Crop rotation	101	5.8	80%
13. System of Rice Intensification (	10	.6	20%
14. Zero tillage (without herbicides)	159	9.1	77%
15. Improved planting distance	4	.2	25%
16 Live terracing	37	2.1	65%
17. Mixed cropping	215	12.3	82%
18. Contour tillage	9	.5	89%
19 Improved cacao seeding	1	.1	100%
	536	30.7	
New crops/ alternative livelihoods			
20. Fish baskets	22	1.3	41%
21. Improved freshwater fisheries techniques	54	3.1	28%
22. New crop varieties	2	.2	100%
	78	4.6	
Total	1746	100.0	

Conclusions

- In Kalimantan, Climate Change aggravates negative effects of unsustainable development, resulting in increased disaster risks: more hazards, more vulnerability, less coping capacity
- Living on the Peat lands of Kalimantan presents a dilemma: people have become dependent upon the systems and infrastructures that undermine their livelihoods
- Solutions ought to be developed with full participation of the local communities and need to be embedded in the local, provincial and national policies
- Climate change related problems with strong adverse impacts on people's livelihoods may create an atmosphere of change, creativity and innovation.