Who controls and benefits from *Tambak* (Brackish Water Aquaculture) in Aceh before Tsunami

World Agroforestry Centre
TRANSFORMING LIVES AND LANDSCAPES

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Integrated Natural Resource Management and Livelihood Paradigms in Recovery from the Tsunami in Aceh

Study on Socio-Economic Aspects of *Tambak* Production in Aceh

Background of the study

The December 2004 tsunami brought Aceh (Nanggroe Aceh Darrusalam) and its coastal zone to the forefront of public interest in discussions on environment and development.

Conversion of mangrove forest to shrimp/fish ponds in the 1980s almost certainly increased the death toll from the tsunami.

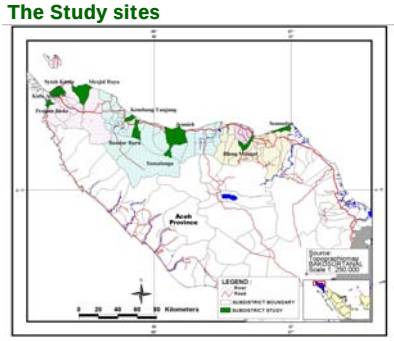
There is widespread pressure and interest from government and international donors to assist in the restoration of these aquaculture-based livelihoods, particularly along Aceh's northeastern coast, after December 2004 tsunami, but little is really known about the social, economic, and legal issues related to brackish water aquaculture in Aceh.

Objective and Method

To clarify the social, economic and legal issues that relate to the development of *tambak* in the mangrove zone, as a contribution to the debate on rehabilitation strategies

The study used rapid assessment methods construct farm budgets for the operation of *tambak*s, focusing on 'returns to land' and 'returns to labour'. It involved all tsunami affected parts of the north and east coast of Aceh – with a gradient in impact by the tsunami from Banda Aceh eastwards. Twelve villages in nine *kecamatan* (sub-district) were selected for detailed survey. Hence, the study observed a gradient where all *tambak* areas were destroyed by the tsunami close to Banda Aceh while damage was about 50% in Aceh Utara and Loksheumawhe where our survey ended.

The Study sites



Sample villages: population, and the extent of brackis water pond

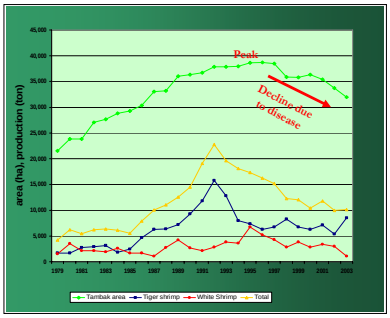
City/ Regencies	Kecamatan (sub-district)	Villages	Population 2004 total	Brackiswater pond area (ha)	Estimate of tsunami damage	
					ha	%
Kota Banda Aceh	Kec. Syiah Kuala	Tibang	1,198	130	130	100%
	Kec. Kuta Alam	Lambaro Skip	4,151	150	150	100%
Kab. Aceh Besar	Kec. Masjid Raya	Lamnga, Gampong Baro, and Neuheun	2,910	192	192	100%
	Kec. Peukan Bada	Lam Tengoh	912	50	50	100%
Kab. Pidie	Kec. Kembang Tanjong	Lancang	1,469	216	194.4	90%
	Kec. Bandar Baro	Baroh Lancok	1,621	207	144.9	70%
Kab. Bireun	Kec. Samalanga	Meunasah Lancok	126	43	30.1	70%
	Kec. Jeunib	Teupin Keupula	582	85	51	60%
Kab. Aceh Utara	Kec. Seunedon	Matang Lada	809	260	130	50%
Kota hokeumawe	Kec. Blang Mangat	Kuala Meuraksa	633	100	45	45%
			14,411	1,433	1,117.4	78%

Sources : Potensi Desa Provinsi NAD 2003, and other primary data sources collected through focus group discussion in the sample villages

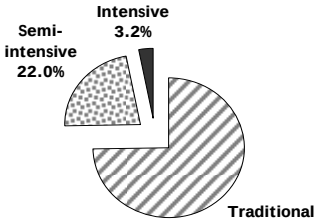
Brackish water pond in Aceh 2003: Area and Production, 2003

Total area (ha)		36,597
Effective area (ha)		31,996
Production (ton)		16,269
Tiger shrimp (*Penaeus monodon)*	8,487	
White shrimp *(P. merguiensis)*	1,067	
Other shrimp *(Metapenaeus spp.)*	585	
Milkfish (*Chanos chanos*)	6,131	
Productivity (t/ha)		0.51

Tambak Area and Shrimp Production in Aceh 1979 - 2003



Brackish-water pond in Aceh by technology, 2004

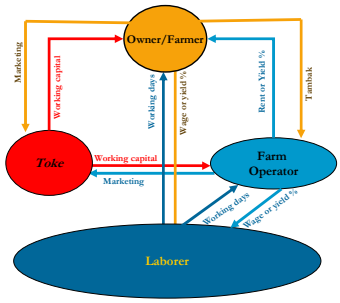


Main actors of tambak operation in the selected villages

Tambak area (ha)	1.433,15 ha
Tambak owner	834 (6%)
Number of households	2.712
Number of people	12.285 (94%)
Toke (middlemen)	27

Land ownership

- 19.8% of the *tambak* is on 'non-private' land.
- But, only 36.5% for the privately owned land with tambak is covered by a land certificate.
- Most of the certified ownership is in the urban area close to Banda Aceh (Tibang and Lambaro skep, 99.5% and 44.9% respectively) and Pidie (Baroh Lancok, 43.9%). Elsewhere certification is less than 15%.



Capital and Profitability of brackish water aquaculture

		Intensive	Semi-Intensive	Traditional Plus	Traditional
Initial capital	Rp 000 ha[-1]	47,613	44,183	18,905	17,915
Working capital needed	Rp 000 ha[-1]	69,392	37,895	16,172	11,289
		113,005	82,079	35,078	29,203
Returns to land					
NPV (10 years tambak operation)	Rp (000)ha[-1]	404,666	85,716	26,857	20,555
Returns to labor	Rp/ps-day	244,649	74,529	46,332	44,802

Labor requirements for brackish water aquaculture by technology

	Unit	Intensive	Semi-Intensive	Traditional Plus	Traditional
Tambak establishment					
professional labor (back-hoe operator)	ps-d/ha	9	9	0	0
skilled labor	ps-d/ha	155	65	80	40
unskilled labor	ps-d/ha	32	25	90	86
		196	99	144	114
Operational					
professional labor (management & technician)	ps-mha/year	2	0	0	0
skilled labor	ps-d/ha/year	349	109	10	6
unskilled labor	ps-d/ha/year	390	412	489	386
		739	521	499	392

Macroeconomics parameters : US $ 1 = Rp 9,500; Discount rate = 15%; Agricultural wage rate Rp 35,000/ps-d

Private profitability of tambak is high….
But social costs of mangrove lost are not included in this calculation:
- Loss of fish production
- Loss of coastal protection function: enhanced probability of X-000 deaths once in Y-000 years

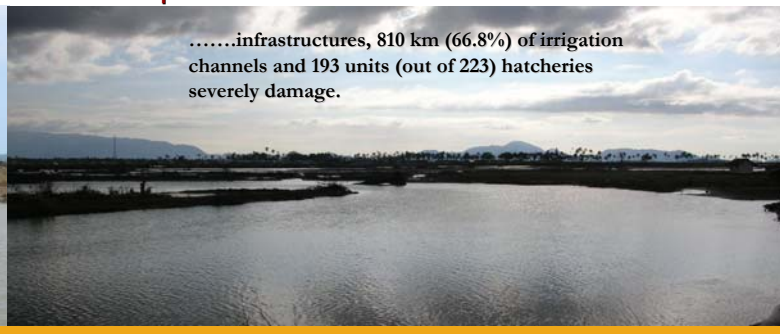
Is this a failure of local institutions?
Can collective benefits off-set private gains?
Is there any local activity that can compete with tambak in returns to labour??

Post Tsunami: A lament for the brackish-water pond in Aceh Province

Most of physical capital supporting *tambak* production that was developed in decades was washed away. An assessment carried out by FAO (Philip and Budiman, 2005: 34-37) weeks after the natural disaster, noted that 20.429 ha or 42.9% of *tambak* in the province, with varies of damage, lost its production capacity. About 1,000 ha of *tambak* were permanently inundated due to the change of coastal line inward, and 7,300 ha were severely damaged.

Brackish-water farming contributes highly significant to overall fisheries values in Aceh; 32% of total fishery value. MAFF/World Bank figures give the fishery sector of Aceh a value of Rp 1.59 trillion, or US$176.67 million(Philip and Budiman, 2005: 2)

Credit photos : Indra Zainun



…….infrastructures, 810 km (66.8%) of irrigation channels and 193 units (out of 223) hatcheries severely damage.