

Can indigenous knowledge still be relevant for wildlife conservation in a changing world?

(Case studies from North Kalimantan)

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Background Stories

- The study and use of traditional ecological knowledge is widely considered an important component of biodiversity assessments and conservation in the tropics.
- Wildlife knowledge assessments can benefit research because local peoples with a long history of interaction with the particular target area may have considerable knowledge of the local flora and fauna.

Background Stories

- In regions where residents have long histories of exploiting local wildlife resources, knowledge of animals and their habitats is usually well defined, the language is specific with descriptive terms for even subtle differences, and the value of this information for research and conservation is high.
- Knowledge about wildlife and conservation can be significant influences on people's attitudes toward wildlife and ultimately their support for conservation.

Background Stories

- However, indigenous people have been introduced by 'more easily' earned income scheme and somehow forced to move or are outnumbered by migrants.
- This situation could pass across and even influence local people's perceptions of and attitudes toward the conservation of related wildlife.
- The question is: HOW MUCH FURTHER COULD THAT BE?

Case Study-1

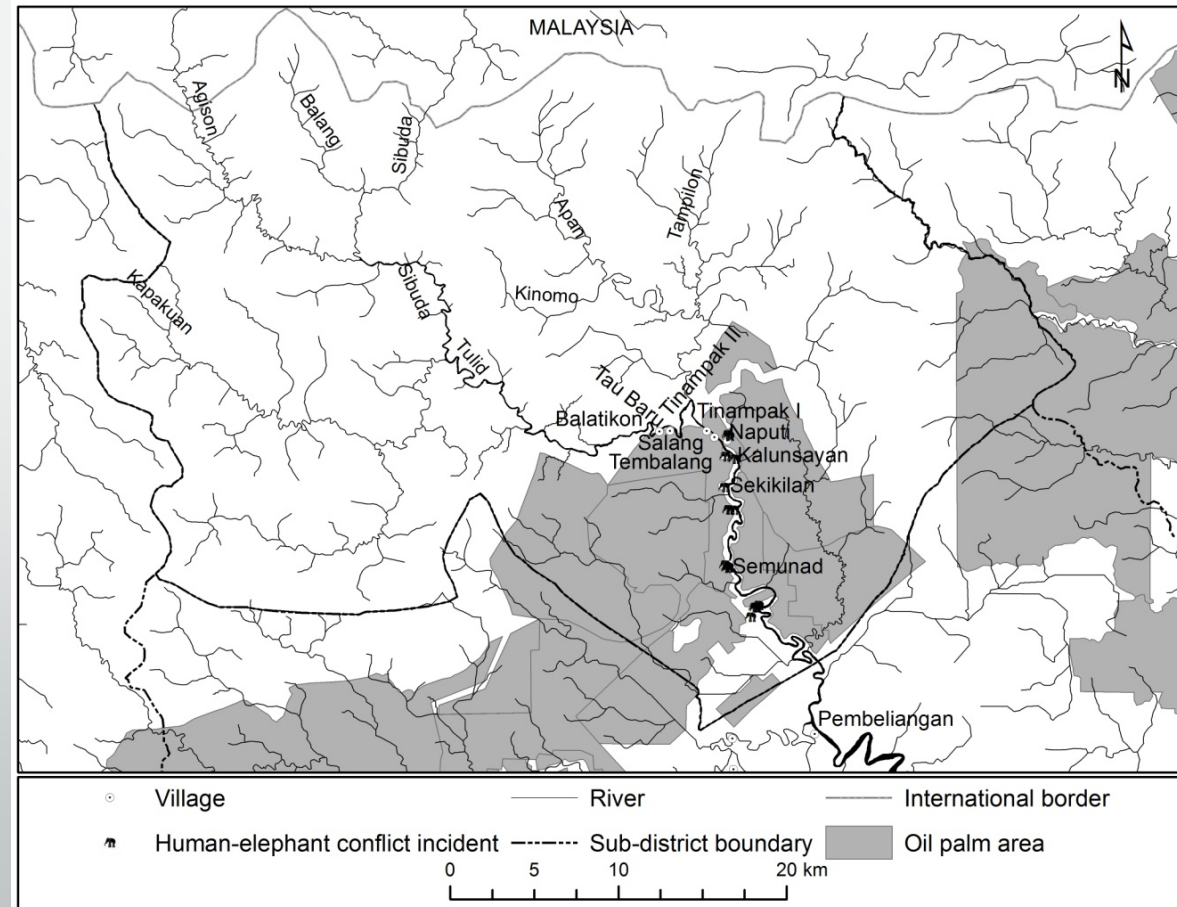
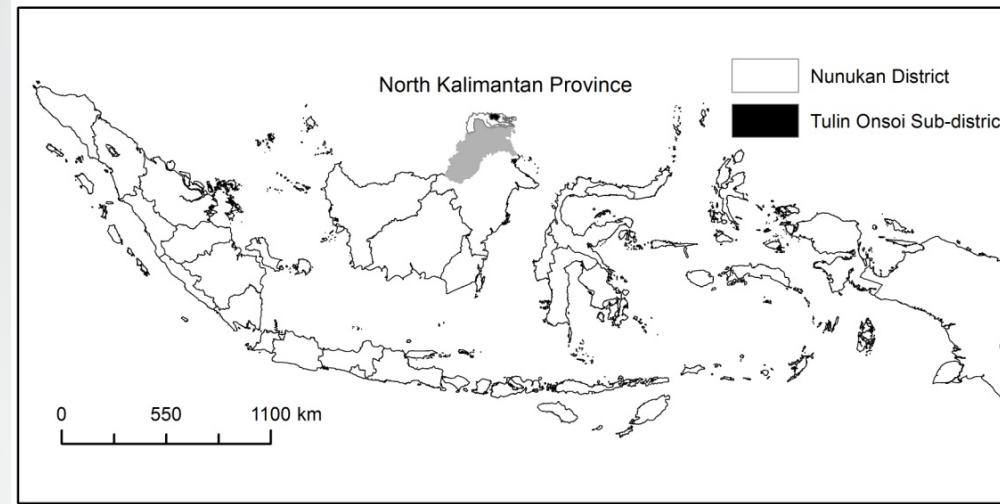
- Bornean elephant (*Elephas maximus borneensis*) in Tulin Onsoi Sub-district, Nunukan District

Study Area

The study were conducted in ten villages:

- ☐ Balatikon
- ☐ Tau Baru
- ☐ Tinampak II
- ☐ Tinampak I
- ☐ Salang
- ☐ Naputi
- ☐ Tembalang
- ☐ Kalunsayan
- ☐ Sekikilan
- ☐ Semunad

The indigenous Agabag Dayak community are dominant



Traditional Beliefs Toward Elephants

- Elephants have played an important role in cultural heritage and local traditions. In local stories, elephants would, for instance, lead people that are lost in the forest back to their homes.
- Elephants are said to be God's creation that regarded as guardians of humans.
- Elephants are often called grandparents (*yaki* for male or *yadu* for female) as a sign of respect.
- Attempts to observe elephants in the wild are considered to be disrespectful.

What change happened?

- Tulin Onsoi Sub-district → one of the main target of the provincial oil palm plantation program
- The two main estates : *KHL* 20,000 ha and *TSJ* 7,892.18 ha (2002)
- 2002-2005: Nucleus Estate and Smallholder (NES)
- Land use change → expansion of oil palm → Human-Elephant Conflict (HEC)

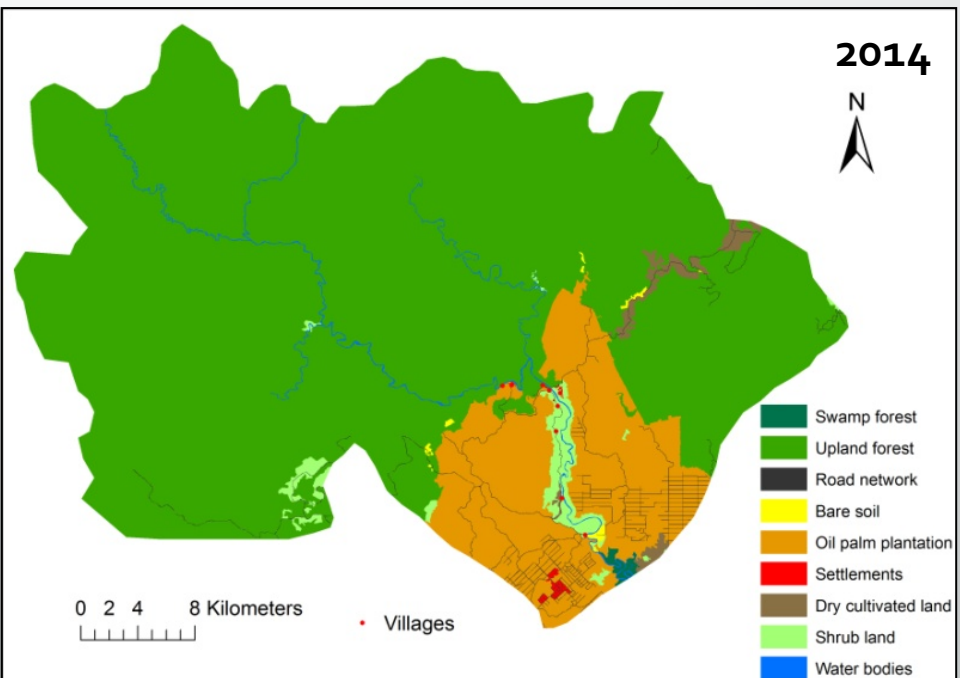
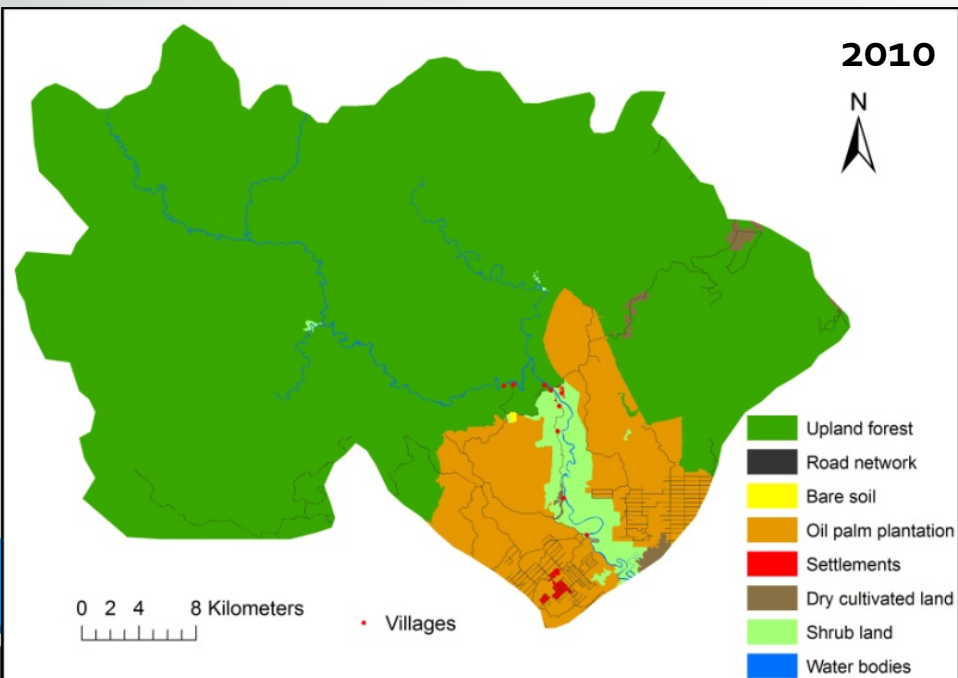
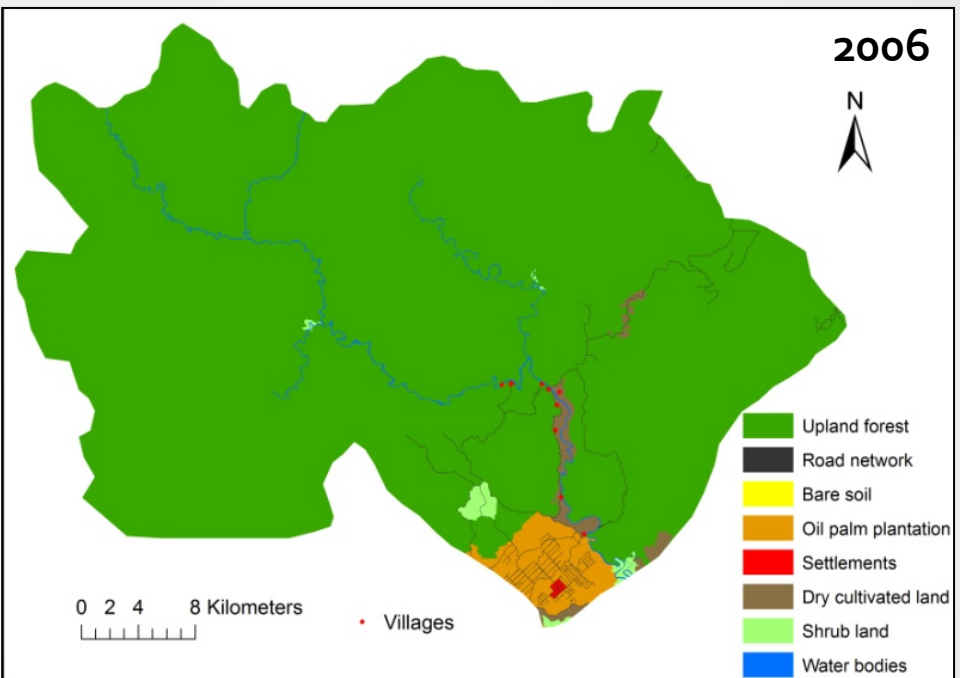
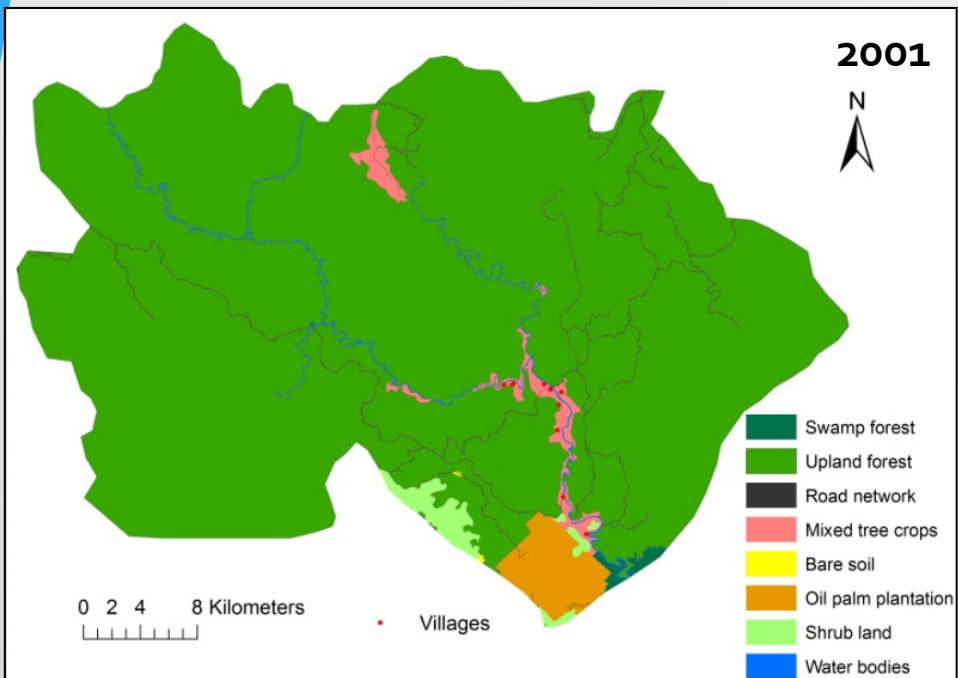


Table 4. Percentage of Responses (Yes, No, and Don't Know) to the Question Whether Elephants and Humans Can Live Together in Harmony and the Elaborated Explanation or Requirement.

Response	Percentage of responses ($n = 213$)
Yes	32.4
<ul style="list-style-type: none"> Folklore (ancestor): “we need each other”; “we are related” 	9.0
<ul style="list-style-type: none"> “But elephants should be tamed” 	7.1
<ul style="list-style-type: none"> “If they cause no trouble” 	5.7
<ul style="list-style-type: none"> No further comments, don't know, other 	5.4
<ul style="list-style-type: none"> “They should be respected”; “if forest destruction stops” 	5.2
No	43.2
<ul style="list-style-type: none"> Elephants damage the crops 	15.5
<ul style="list-style-type: none"> People are scared of elephants 	11.3
<ul style="list-style-type: none"> Elephants are wild animals, not pets 	8.5
<ul style="list-style-type: none"> No further comments/other 	7.9
Don't know	24.4



Attitudes Toward Elephants

- 79% of all respondents say that oil palm expansion is the main cause of HEC.
- About 21% also mention logging operations in the area as a cause of HEC, claiming that logging operations have destroyed some of the natural salt licks in the area and disrupted elephant movements in the Sebuku Forest.
- 43.2% of the respondents expressed an outright negative attitude toward elephants, with “loss of crops” (15.5%) as the main motivation for this negative attitude.

Table 5. Logistic Regression Analysis, With Wald χ^2 Statistical Test, for Answers to Survey Questions 12, 13, and 14 (N [total respondents/households] = 213; n = affirmative answer].

Test statistics

Question/predictor variable	Estimate	SE	χ^2	df	p	Odds ratio estimate
12) Do you think elephants and humans can live together in harmony? (n = 69)						
Ethnic group (n = 46 Dayak Abagag, n = 23 other)	-0.67	.53	1.57	1	.21	0.51
Age	-0.001	.02	0.002	1	.97	0.51
Educational background (n = 17 with no education)						
Basic education (n = 37)	0.78	.54	2.14	1	.14	2.19
Further education (n = 15)	0.45	.43	1.12	1	.29	1.57
Year of residence	0.003	.17	0.03	1	.87	1.00
Prior elephant crop damage (37 absent, 32 present)	0.93	.35	7.06	1	.008	2.53
13) Do you know that elephants are protected by local customs or rights? (n = 156)						
Ethnic group (n = 131 Dayak Abagag, n = 25 other)	1.35	.46	8.47	1	.004	3.84
Age	0.008	.02	0.22	1	.64	1.01
Educational background (n = 34 with no education)						
Basic education (n = 88)	-0.12	0.49	0.06	1	.80	0.88
Further education (n = 34)	0.37	.39	0.89	1	.35	1.45
Year of residence	0.00	.02	0.00	1	.99	1.00
14) Do you know that elephants are protected by Indonesia law? (n = 192)						
Ethnic group (n = 154 Dayak Abagag, n = 38 other)	1.57	.65	5.92	1	.02	4.80
Age	0.002	.03	0.007	1	.93	1.00
Educational background (n = 45 with no education)						
Basic education (n = 105)	0.87	.73	1.44	1	.23	2.39
Further education (n = 42)	0.88	.54	2.59	1	.11	2.40
Year of residence	-0.01	.02	0.22	1	.64	0.99

Attitudes Toward Elephants

- 32.4% of the respondents believe humans can live in harmony with elephants but only under certain conditions.
- 43.2% believe coexistence is difficult as elephants raid crops. Affirmative answers to our questions regarding human–elephant coexistence are significantly influenced by crop damage ($p=0.008$).
- The odds of affirmative answers to whether elephants and humans can live together in harmony were 2.53 times higher for people whose fields were not damaged by elephants.

Traditional Beliefs and Attitudes Toward Elephants

- 73.8% of the respondents answered “yes” to the question “do you know that elephants are protected by local customs or rights?” Dayak Agabag are significantly more knowledgeable on elephant protection legislation than other ethnic groups ($p=0.004$ and $p=0.02$, respectively).
- The odds of an affirmative answer to whether they knew about local customs or rights and laws for elephant protection were 3.84 and 4.80 times higher, respectively, for Dayak Agabag as opposed to other ethnic groups.

Traditional Beliefs and Attitudes Toward Elephants

- Although the majority of respondents are supportive of elephant conservation in the Tulin Onsoi subdistrict, they claimed that it is currently not directly benefitting them.
- Most respondents acknowledge that elephants are an integral part of their culture, but people also mention that elephants are causing problems, for example, “the elephants are giving us a hard time nowadays” and that these problems should be tackled by government: “If government wants to protect elephants, it should implement measures to prevent them from raiding our crops.”

Indigenous knowledge in a changing situation

- Between 2001 and 2014, the total land area covered by oil palm plantations in the Tulin Onsoi subdistrict increased more than five times, from 3,302.71 ha in 2001 to 21,124.93 ha in 2014, leading to increased elephant crop-raiding incidents.
- HEC has become a significant problem in the Tulin Onsoi subdistrict and attitudes toward elephants have become negative, despite the deeply rooted respect for elephants throughout history.
- Negative perceptions of elephants are mainly caused by crop damage → Attitudes toward wildlife may be influenced by past and present interaction.

Indigenous knowledge in a changing situation

- The local people generally have a good knowledge of elephant behavior and the legislation under which elephants are currently protected.
- They are supportive of elephant conservation in the Tulin Onsoi subdistrict although they do worry about the costs associated with damage by elephants
- Effective mitigation measures are urgently required and if local support fails to actually target the villagers' concerns, attitudes toward elephants could become even more negative and fear could turn into frustration.
- Then, traditional beliefs and local knowledge values will then no longer protect the elephants.
- Therefore, HEC can hinder efforts to save the species, although negative attitudes toward elephants have not yet led to cases of retaliation in the Tulin Onsoi subdistrict.

Indigenous knowledge in a changing situation

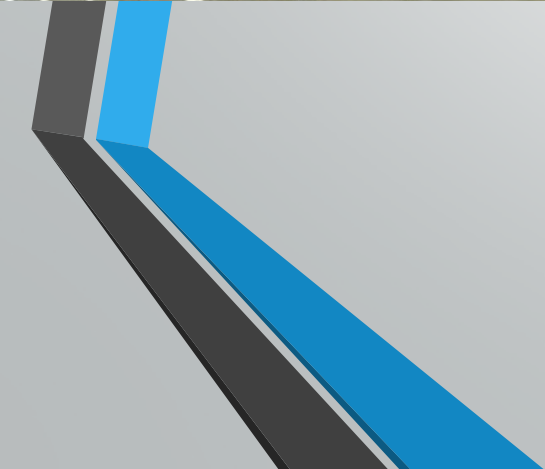
- Efforts to save the elephant and its habitat in the future depend on a local support.
- Fostering cultural values that enable people to live in close proximity to elephants could help to support elephant conservation.
- Education as a tool in the prevention of HEC could assist local mitigation efforts.
- Reinvigorating the local traditional knowledge and perceptions on elephants could at least serve as a basis to reinstate a sense of common responsibility for the protections of elephants.

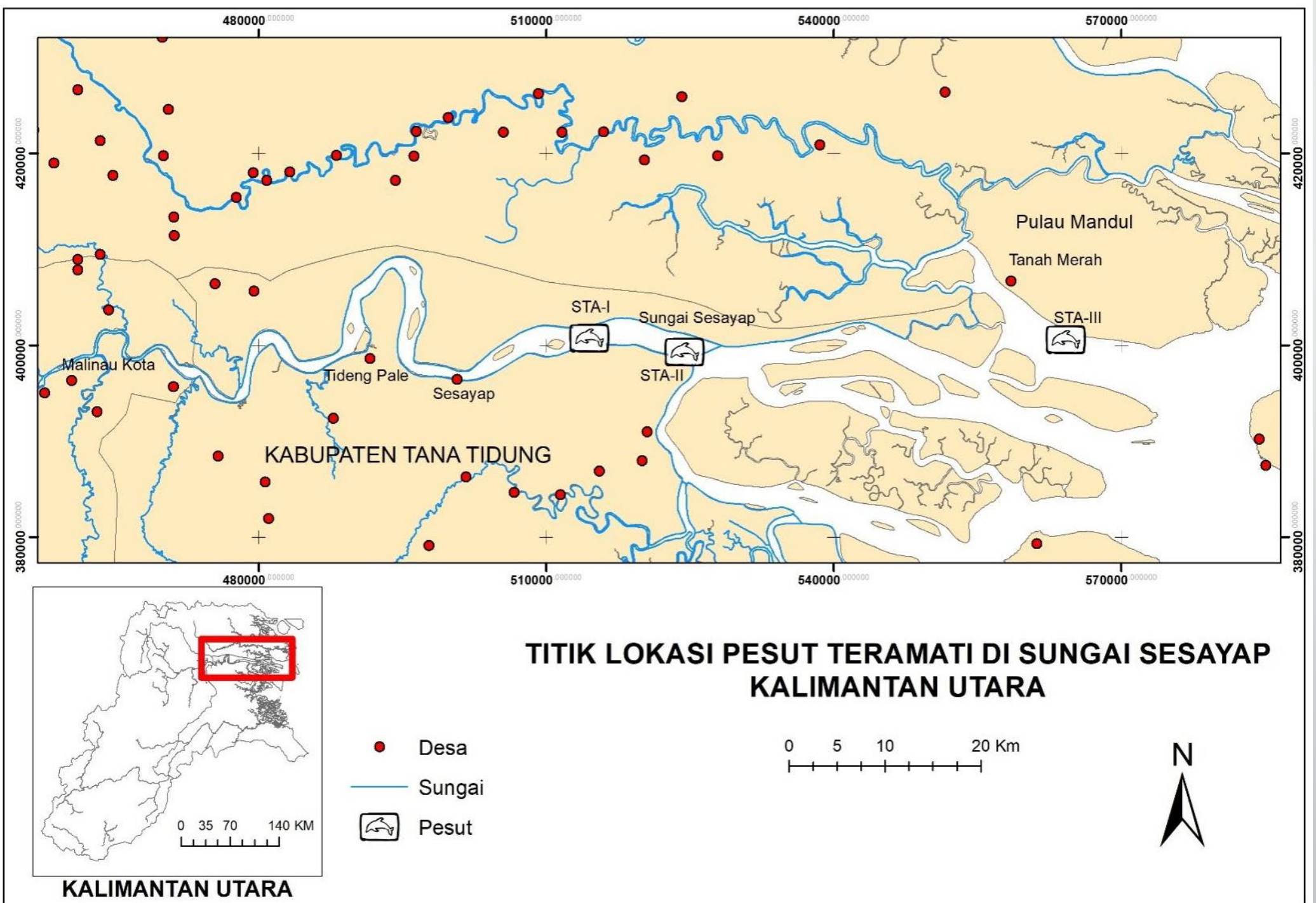
Case Study-2

- River dolphin (*Orcaella brevirostris*) in Sesayap river, Tana Tidung District

Some facts

- People living along the Sesayap river have known the dolphin's presence from a long time ago by naming *lamud* in Tidung language, which means dolphin.
- According to interview results, river dolphins in the Sesayap river have been seen before the 1960s, quite frequently along Sesayap river to the capital of Tana Tidung District, Tideng Pale.
- Between 2000-2009, river dolphins were seen in the Malinau river. There are also respondents mentioning that river dolphins reach Malinau river to the river harbour of Malinau.
- Respondents are convinced that the river dolphin population in the Sesayap river remains stable.





Opportunity for Conservation through Local Wisdom

- The opportunity for river dolphin protection through community participation is most likely because the local community knows about the river dolphin protection status; besides, there is an unwritten rule among local people regarding river dolphin protection in the Sesayap river.
- Lamud has been sacred in the Tidung community who live along the Sesayap river from generation to generation. This belief establishes local wisdom in the community to protect river dolphins and let them coexist with humans.

Future Change to Anticipate

- The disturbances on river dolphin existence in the Sesayap river : river transportation, the change of river water quality caused by river pollution, caught in the fisherman's net, natural death, and food resource shortage.
- Habitat loss and degradation were presumed to be the biggest threat to river dolphin existence in the Sesayap river unto Mandul island delta, which are caused by coal mining, sedimentation, and chemical pollution from large scale oil palm estates.
- Some water quality parameters tend to rise in a negative fashion caused by coal mining pollution, i.e., total dissolved solids (696 mg/L), total suspended solid(270 mg/L), sulphate (7,526 mg/L), and sulfide (H_2S) (0.207 mg/L).
- Research is still on going to document land use and land cover change surrounding Sesayap tributary

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Thank You