

Research Note

Kampung Air: Water Settlements on the Island of Borneo

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This paper presents the results of a baseline study of settlements built on water (kampung air) along the coast and rivers of Borneo. Using remote sensing data we measured the extent of water villages and estimated their number of households and inhabitants. We estimate that water villages cover an area of approximately 25 sq. km, housing 215,000 inhabitants. Though water villages are closely routed in Malay customs and traditions, it appears that other communities have also moved in, making use of relatively cheap accommodation. Further research is advocated, especially in view of the fact that climate change and sea level rise will reduce land areas suitable for housing construction.

Introduction

Borneo's coastal areas and river estuaries are prone to occasional heavy rainfall and flooding. Swamps and low areas a few feet above sea level are found not only along the coasts but also further inland (Fig. 1). The coastal population has adjusted to

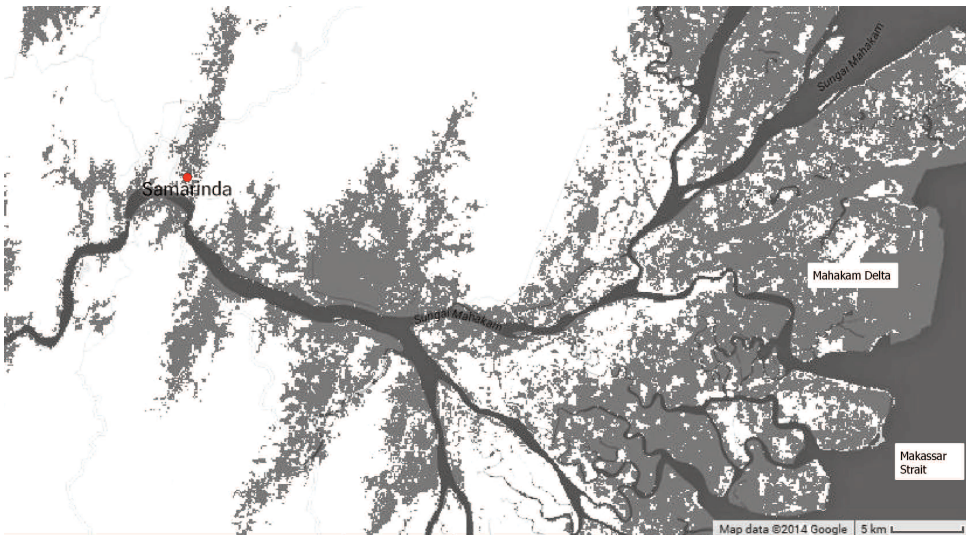


FIG. 1: Land below an elevation of 5 m above sea level, Kapas Delta, East Kalimantan.
Source: Firetree.net.

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these hydrological conditions and established settlements sustainable under these conditions. Considerations of security from floods, wild animals and human enemies have shaped housing and settlement patterns around Borneo and, indeed, in many other parts of Southeast Asia.¹ Living on water has been one of the answers to coping with harsh geo-physical conditions.² This has been a common practice among various Austronesian groups throughout Southeast Asia.³

Malay houses have traditionally been built on stilts to lift living quarters off the muddy and often flooded ground. A cooling breeze can keep living quarters cool and insects away. Along the estuaries of rivers houses were often built on the water, increasing safety and easy access to river transport. Water settlements are also found in other parts of Southeast Asia, such as Cambodia, Vietnam,⁴ Thailand, Singapore and elsewhere in Indonesia and Malaysia. Though Malays have undoubtedly been the most fervent builders of water villages, other local and migrant groups have also settled on water.⁵ Water settlements were also constituent elements of 'hydraulic societies' as found in ancient China, in Thailand, Cambodia and Vietnam.⁶

As the Malay kingdoms around Borneo had their centres of power, government and trade located at the estuaries of larger rivers,⁷ their 'capitals' were also built on water. Brunei Darussalam, Pontianak, Kutai and other Malay kingdoms had water villages (*kampung air*) as their capital 'cities', but also other settlements were mostly Malay water villages or longhouses of other ethnic groups. With modernization, urbanization and economic development, settlements sprang up on higher ground, often clustered around government offices or Chinese shophouses.

Water villages disappeared in some areas; in others they expanded with population increase. Our pilot study shows the extent of water villages as typical Borneo settlements. We also estimate the number of families and persons living in water villages. Based on remote sensing data we provide a baseline study which can be used as a background to more detailed field research. Based on the very limited literature and our occasional field visits we guess that the ethnic composition of water villages has become quite diverse with growing social and geographical mobility and with the influx of migrant workers from neighbouring countries. With the motorization of river traffic, even formerly remote water villages have become accessible from the newly emerging urban centres and have apparently grown in size.

1 Waterson (1993).

2 Evers (2013).

3 Dumarcay (1987); Waterson (1990).

4 Biggs et al. (2009).

5 Bideau and Kilani (2010).

6 Evers and Benedikter (2009); Molle et al. (2009).

7 Boomgaard (2007).

Measuring Water Villages around Borneo

In order to measure the extent of water villages we have used remote sensing data, based on Google Earth and, occasionally, Landsat data. Polygons were drawn around the clearly visible water settlements around the coastline of Borneo, its major river estuaries and its islands and the number of houses counted (see Fig 2).



FIG. 2: Measuring the size of water villages (example from Labuan).

Source: Google Earth, November 2013.

From the number of houses and data on the average population per household a rough estimate of the population size can be calculated.

Our analysis yielded the following results

- We identified 84 major water villages (*kampung air*) on Borneo (Fig. 3).
- Water villages occupy a total area of 24.52 sq. km (Table 1).
- An estimated number of 43,025 houses and 215,000 people in water villages around Borneo.

As smaller settlements and water villages on the upper reaches of Borneo's rivers were not counted, our figures probably underestimate the total number of people living in water villages.

Our baseline survey showed that water settlements are found all around the coastal areas of Borneo, but with a concentration in the low-lying areas of South and East Kalimantan. The largest water village is probably Kampong Ayer along the



FIG. 3: Water villages around Borneo.

Source: GIS data based on Google Earth, 2013.

Data analysis and map design: Hans-Dieter Evers, Anthony Banyouko Ngah and Khairi Latif (Universiti Brunei Darussalam).

Table 1. Size of Water Villages by State or Province, 2013

State / Province	Water villages (sq. km)
Brunei Darussalam	2.2
Central Kalimantan	2.0
East Kalimantan	6.4
South Kalimantan	6.7
West Kalimantan	1.1
Sabah	5.8
Sarawak	0.4
Total	24.6

Brunei River. Consisting of 42 individual settlements, Kampong Ayer is the traditional heartland of the independent state and Sultanate of Brunei Darussalam, housing an estimated population of over 30,000.⁸ This is partly due to the planned and newly constructed water village settlements built by the Bruneian government since the 1980s.⁹ South and East Kalimantan contain vast low-lying areas, for which the construction of water villages is suitable or even mandatory. Here we find the highest concentration of water villages (Fig. 4).

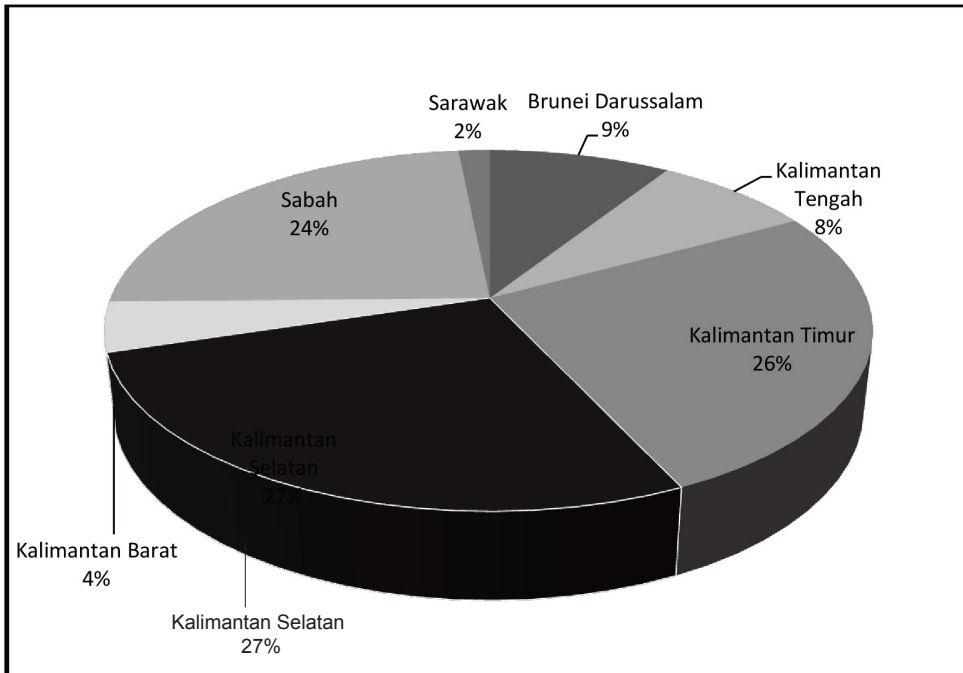


FIG. 4: Area of water villages in various territories (in sq. km).

Source: own estimates, based on Google Earth 2013 and author's field data.

Conclusion

As we can show on the basis of our survey, water villages are still an important form of settlement on Borneo. Our data opened up a number of possible research questions. As indicated above, houses on stilts and water villages are part of the housing tradition and physical culture of the Malays. It remains, however, an open question as to who actually inhabits current water villages. There are indications that migrant workers have moved into the water villages of Brunei Darussalam. Our field studies in East Kalimantan¹⁰ have shown that water settlements along the middle

⁸ Fanselow (2014); Kershaw (2002); King (1994).

⁹ Jones (1997).

¹⁰ Clauss et al. (1987); Evers et al. (1988); Evers and Gerke (1992).

Mahakham River are settled by mostly Kutai Malays, but other ethnic groups, like various Dayak groups, have also moved from the interior of Borneo to the coastal rivers and are found in water villages as well.¹¹

The overall population dynamics of Bornean water villages is of special interest in light of the expected sea level rise due to climate change.¹² This will reduce dry land suitable for settlements and urban expansion, and may force an even more extensive construction of water villages on Borneo and elsewhere in Asia. Experience gained in centuries of 'living on water' will be a valuable asset that needs to be recorded.

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¹¹ Gerke (1997).

¹² Evers (2013); IPCC (2014).

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