

## Appendix 2

This appendix provides a more comprehensive description of the communities and their livelihood context.

**Kay:** Most of the territory is level and seasonally flooded but there is steeper terrain reaching to about 350 m a.s.l. in the north. Valued resources included sago (*Metroxylon sagu*), rattan (various species *Calamus* spp., *Daemonorops*, spp. and perhaps *Korthalsia* spp.), crocodile (*Crocodylus novaeguineae* and *C. porosus*), fish (various marine and fresh water species), wild pigs (*Sus scrofa*), cassowaries (*Casuaris unappendiculatus*), and decorative birds (primarily “Lesser bird-of-paradise” *Paradisaea minor* but also the “Twelve-wired bird-of-paradise” *Seleucidis melanoleucus*). The community had two settlements at the time of our surveys which were relatively close to each other and accessible, and the community still operated as a single unit (we spent most time in Kay 1). Access to both settlements was by boat, dependent on river conditions. Clan territories were bounded by river channels.

**Metaweja:** The mountainous territory reached 900m a.s.l. and was steeply incised with an abundance of streams and rivers. Access was challenging with rivers frequently un-navigable by boats due to rocks and low water. People often walked for several days to and from the village. The most valued resources were wild pigs, cassowaries, bird-of-paradise, and sago. Boundaries between clan territories follow rivers and ridges.

**Yoke:** The territory comprised low-lying coastal mangrove, lakes and tidal swamps (fresh, brackish and salt water) divided by channels with a few low scattered hills. Access by small boat was relatively simple. Important resources included fish, crocodile, sago and coconut (*Cocos nucifera*).

### *Access and communication*

Local people sometimes walked among settlements but preferred boats when the rivers were navigable. Outboard engines were widely used. Planes could be used to evacuate people needing medical treatment (see later).

There was no phone coverage. Two-way radios provided regular communication among settlements, and were used to plan local flights. Nonetheless, passing boats

remained a major source of local information. Boats could not easily pass any settlement unobserved – most stopped to exchange news and specific messages were often passed between communities.

### *Language and education*

Each village possessed distinct local languages (Kay has two). Most people had at least basic Indonesian and many, including most young men, are fluent. Our surveys indicate that most men and women in Yoke had some formal education (156 of 193 selected systematically, with 9 of 193 villagers having higher education i.e. training at college or university) but in less accessible Metaweja (92 of 214 villagers, with 3 of 214 villagers had higher education) and Kay (no systematic data) only about half had any schooling.

### *External influences*

Government and church missions provide some services. School and clinic buildings exist but staff were generally absent during our work periods. All three villages had elementary schools but only Kay had a secondary school – in the other villages many teenagers (mostly boys) attend secondary school in other towns returning only during school holidays. Government officials visited occasionally, e.g. with health programs and for elections.

Church missions had invested in village buildings and maintained a regional system of light planes and commercial flights to support church activities and evacuate medical emergencies. Kay had a poorly maintained airstrip for small planes. Construction of an airstrip at Metaweja began in 2011.

Interactions with other outsiders were limited. A team surveyed crocodiles and visited many communities in the 1980s (Frazier 1988). Our own research, and the activities of Conservation International, have involved sporadic visits over a decade. There was no regular tourism (we encountered one independent traveler in 2013). Metaweja villagers recalled a visit by geologists in 1985 (see discussion).

### *Livelihoods*

Sago (*Metroxylon sagu* both wild and planted) was the principal staple in all three communities. Other crops included banana (*Musa* sp.), coconut (*Coco nucifera*), cassava (*Manihot esculenta*), sweet potato (*Ipomoea batatas*) and taro (*Colocasia esculenta*). Hunting and fishing provided animal fat and protein. Fishing predominated in the dry season and hunting in wetter months, a cycle that we were told follows animal abundance and fruit seasons. Hunting relies on traditional methods. Though some people own air rifles we saw no evidence of more powerful guns. Fishing involves nylon nets and boats with outboard engines. Gardens, fallows and the areas used for gathering fuel wood tended to be close to habitation, whereas hunting occurred over larger areas.

Aside from the village leader, secretary and some teaching, paid work in the villages was absent. Remittances were important for some families but most households traded products when they needed cash. The villages had kiosks selling basic goods (matches, batteries, thread, detergent, knives, etc.); these were stocked by traders who operated along the main rivers and also bought local products for cash. Trade items included dried fish swim-bladders used in traditional Chinese remedies, dried meat and bird-of-paradise (both skins and live birds). From the 1950s until 2008, when prices fell too low, crocodile skin collection was a lucrative activity for many. Cash crops played a negligible role.

### *Land ownership, access and controls*

Clear ownership and rights of access and use occurred in all three territories though there are some localized nuances and occasional ambiguities. Some boundary areas were shared between friendly communities, for example Yoke and Subu share fishing rights in Lake Tabaresia. Much depends on local relationships; for example at Metaweja's border with Gunung Surumaja incursions are not tolerated, while Tamaja, another neighboring village, shares the river Hakwa, which marks the border between them. Neighboring villagers are on good terms with Metaweja; they even

occasionally request and are granted permission to hunt or collect in an agreed area within Metaweja's territory.

Lands within each community territory were further subdivided by clans (*marga*). Some older sago groves were jointly managed within clans, or occasionally at village level (some sago groves in Yoke) but for recent plantings and all other crops, private ownership applied (individual, family or clan). Most large rivers were accessible to fishing by all villagers regardless of clan, but most other products were subject to clan oversight, rights and restrictions though permission could be requested by others. Rights to land and resources were inherited through the father's clan line though children could sometimes claim certain rights within their mother's clan territory, and we heard of a case (in Yoke) where a family had changed a child's recognized clan to that of the mother.

Informants generally answer questions only about areas under their own clan. (Villagers in Kay were especially reluctant to mention clan territories to outsiders as the village settlement lies within two clan territories, the Tebeiko and the Weriko, and this is recognized as a potential source of conflict among the clans, though clan boundaries are clearly recognized in the surrounding territory).

The communities recognized and enforced various rules governing access and activities in all areas. Details varied by site but access to all areas outside of the main river and the village required pre-existing rights or specific permission. Some areas were strictly protected and all extractive activity prohibited: these included sacred areas such as mountains in Metaweja, lakes and springs in Kay, and certain channels among the mangrove in Yoke (the latter covering an estimated 5% of the territory). Community members seldom entered such areas due to concerns about harmful spirits. Entering them "safely" required formal rituals and visitors had to be accompanied by a designated clan member.

Traditional beliefs were influential in preventing hunting and other exploration over extensive sections of territory including sacred areas. People from all three villages would behave differently when passing near or through sacred locations: becoming silent, switching off of torches and generally avoiding activities which might draw the

attention of spirits. Sacred areas were frequently mentioned in Metaweja and Kay. In Yoke the people were uncomfortable with this topic. We believe that this difference reflected the customary leader in Yoke dismissing these old beliefs (he was also a churchman).

### *Authority roles*

Three sources of authority operate in the villages: traditional, governmental and religious: this tripartite authority is a general feature of the region (Gibson 2007). All formal leaders were men: though many women were highly respected and influential.

There was a traditional leader (*Ondoafi*) in each community along with elders for each clan (*kepala marga* and *kepala suku*). In all three communities traditional practices persisted such as in approving marriages. Marriages are not permitted within clans but must take place between them. Generally the woman joins the husband's clan, but in Metaweja we were told that outsiders could marry a local woman as long as they paid, provided a sister to a local man, or agreed to settle in the village.

The government representative was the village leader or *kepala desa* with a village secretary or *sekretaris desa* who acted as a deputy. The *kepala desa* is proposed by the village elders and then has to be endorsed by the head of the Regency who also appoints the secretary. The *kepala desa* would be expected to report any serious crimes to higher authorities though such interventions were, we heard, very rare. There were no local police or regular police activities in any village. Villagers reported that a sustained fight in a neighboring village (Burmeseo) resulted in a *kepala desa* requesting and being sent a small military contingent who arrested those involved.

All villagers claimed to be Christian. The church was present through pastors (*pendeta, guru injil*). Christian Missions arrived in 1953 and most villagers formally belong to the protestant church (*Gereja Kristen Indonesia*) though a few are Seventh Day Adventists. Most people regularly attended church services. The church often encouraged discussions within each village that touched on non-religious matters

and were often called upon in resolving conflicts. These discussions typically followed the Sunday service directed by the pastor.

In practice most misdemeanors and conflicts were, we were told, addressed by “traditional” means – though the *kepala desa* and church can be influential. Such roles vary with the leaders and by circumstances; notably Metaweja was unusual in that the customary leader is absent and disengaged (he resided in Kasonaweja) and the government elected leader was also the local pastor and thus held considerable authority.

#### LITERATURE CITED

- Frazier, S. 1988. Mamberamo River crocodile monitoring patrol in the Pagai area. FAO, Jaya Pura.
- Gibson, T. 2007. Islamic narrative and authority in Southeast Asia. Palgrave Macmillan, New York, USA.