

## Chapter 20

# Case Study: The YUS (Yupno, Uruwa and Sam Rivers) Landscape, Huon Peninsula, in Papua New Guinea as an Ongoing and World-Leading Conservation Area Success Story Despite International Coffee and National Park Model Landgrabs



**Abstract** Like for most of Melanesia, and as commonly found with many indigenous peoples throughout the world, Papua New Guinea (PNG)'s land is mostly owned in a complex public land tenure system. A simplistic western-style biodiversity wilderness top-down land protection, e.g. a typical National Park with a single ownership and governance, does not really exist nor will it likely be effective, e.g. due to tribal conflicts, deep legacy, heritage, PNG sustainability management and spiritual and enforcement problems across generations to come. An alternative is the community-owned and people-driven approach ("bottom-up") with a conservation aim, such as Wildlife Management Areas (WMAs) and similar concepts. The rugged and ancient landscape of 'YUS' (encompassing the watersheds of the Yupno, Uruwa and Sam rivers) is one of those unique examples of living landscapes in a community ownership where regional sustainability can be found. It's a certain role model for landscape protection alternatives having used endemic tree kangaroos, cloud forests, 'ridge-to-reef' concepts and rangers, One Health and a social emphasize (see Freeman et al. in *Bulletin of the British Ornithologists' Club* 133:4–18, 2013 for birds). While it is unique in PNG for its long-term success, it's also unique globally because YUS has a missionary legacy and involves a somewhat balanced outside support that actually works over time locally. The YUS region has many conservation species, including the iconic Matschie's Tree Kangaroo found in the virgin mountain forests of over c. 1500 m elevation. YUS has much to study left, and research data are few. YUS is an ancient landscape with coastal trails connecting the coast into the highlands making a case for ridge-to-reef watershed approaches while a commercial export coffee production is carried out in YUS, partly perhaps to make the operation more viable with a western input.

**Keywords** Papua New Guinea (PNG) · YUS (Yupno, Uruwa, Sam Rivers) · Sustainable landscapes · Organic coffee · Wildlife-friendly

## 20.1 Introduction

Papua New Guinea (PNG) offers many fascinating topics and living landscapes (see Loney Planet Guide <https://www.lonelyplanet.com/papua-new-guinea>, Flannery, 1995, p. 18, or Beehler, 2020 for a selection and overview). While most of PNG is ‘in use’ and a livelihood area for people, only a small fraction of them have been described yet with some relevant and organized science detail (Table 20.1 for a selection). Many other details remain unknown due to lack of access, or open data shared, lack of peer-reviewed publications or awareness even (see Huettmann, 2020 for tree kangaroo examples). Arguably, PNG is a wilderness place, but roads, bridges and other developments such as mining and tourism come in the way (Hayan, 1990; West, 2006). On a landscape scale, those then create a *mélange* of cultures; the ancient meets the west and globalization. These cultures and their areas do not have to directly overlap, but they reach far and beyond.

According to Beehler and Laman (2020), PNG carries no National Park really (New Guinea just has one, and details on the land management are not so clear as authors describe), but the public record for PNG states 8

**Table 20.1** List of selected landscapes in Papua New Guinea with some available science subject descriptions

Landscape	Science description details	Citation
PNG border northern region (~Telefomin)	Mammals, tree kangaroos	Flannery (1995, 2000)
Adalbert mountain range	Plants/trees	Webb et al. (2005)
Finisterre range	Linguistics	<a href="https://en.wikipedia.org/wiki/Finisterre_languages">https://en.wikipedia.org/wiki/Finisterre_languages</a>
YUS	Usually a Tree Kangaroo focus	See chapter and citations within
Fly river	Specific aspects covered as part of the Ok Tedi impact assessments	Kirsch (2014)
Sepik river	Specific ecology aspects	Cousteau and Richards (1999)
Mountain forests	A small selection of mountain forest aspects in PNG	See also Crater mountain citations
Cloud forests	A specific selection of mountain forest aspects in PNG	Montgomery and Bishop (2006); Tree Kangaroo Conservation Program (2018)
Crater mountain region and landscape gradient	Mostly a biodiversity, bird focus as well as wider Anthropology	Mack (2014); see also Gillison (1993); Gillison (2002)
Wau region	Wildlife (e.g. birds and mammal aspects), usually in response to impact assessments for oil and gas	Richards (2018)

National Park designations ([https://en.wikipedia.org/wiki/List\\_of\\_protected\\_areas\\_of\\_Papua\\_New\\_Guinea](https://en.wikipedia.org/wiki/List_of_protected_areas_of_Papua_New_Guinea)); many of them are disputed by the land tenure holders though; see Hyndman, 1998 for deeper land conflicts in modern Melanesia). Like in many places in Melanesia, the western-style protected area concept in PNG is arguably inefficient and lacks an assessed outcome and with indigenous people involved; it can be outright destructive and harmful. Landscape components are often maintained by the PNG society. One reason is that those national park areas are hardly untouched by humans, considering PNG's deep history of over 47,000 years with a human occupation on much of the land, including fire and big animal pursuit. It also appears that PNG is somewhat overlooked and ignored for such questions. It's hardly listed in World Heritage Site lists (just one listed and seven are tentative: <https://whc.unesco.org/en/statesparties/pg>); virtually over 95% of PNG is instead in public land trust tenure (Baraka, 2001). With that, the third category of managed/protected areas in PNG, the Wildlife Management Areas (WMAs), become a major item. That's because WMAs are managed through an elected committee that consists of customary landowners. The WMAs are similar to other community conservation and comanagement areas in the world. Likely, they are a success story overall because they are less static and allow humans to exist in a somewhat benign and indigenous fashion. However, they are also relatively "liberal" and allows various industrial usage options, including industrial ones. The latter is a major lobby for land designations in the region and how the landscapes really look like, affecting people!

In the meantime, for many people the real beauty of PNG remains in the areas that are still widely undescribed, hardly well discovered yet.<sup>1</sup> Arguably, PNG offers many opportunities and contributions to mankind and it asks for new concepts to be tested and applied, all the time. Confronting the western world with PNG remains full of insights; it experiments the west.

There are many 'remote' places in PNG but where people make a living already for millennia (see Matthiessen, 1987; Flannery, 2000). A certain human footprint can often be found, directly and indirectly. A few of those places, usually based on access from the coast or rivers, carry a western history from explorers, warfare and prospectors with little documentation (e.g. Nelson, 1982; Flannery; 1995; Wilson, 2019, see Goroka in the highlands as a typical example, e.g. described in Cousteau & Richards, 1999; West, 2006; Mack, 2014).

Many expeditions into the so-called unknown of PNG have been made and written about, e.g. 'AN EPIC JOURNEY: The 1930 Expedition of Michael Leahy and Michael Dwyer across New Guinea via the Purari River' (Willis, 1969).

While the Huon Peninsula was explored and crossed by 'western' explorers (see Table 20.3 for a selected list of YUS explorers), many areas still remain to be investigated and to be understood more.

The remote landscape centered in the uplands of the Huon Peninsula around the Yupno, Uruwa and Sam rivers (YUS) is one of the unique examples where regional sustainability can be found (Montgomery & Bishop, 2006). The area has app. 50

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<sup>1</sup> This statement stands in deep opposition to what Jerry Diamond claimed and that all birds of Papua New Guinea have been described and nothing new can really be found there, far from it.

villages ('hamlets') and 12,000 people, is virtually free of roads, and just a few airstrips exist. It attracts explorers to this very day, e.g. for pursuing Bird of Paradise found at its slopes (Laman & Scholes, 2012).

YUS is located north from the famous Bulolo river connecting with a road to the wider Markham tributaries where an initial set of PNG's early gold fields were located. However, YUS is not really impacted from roads and has its own dynamics and development going on. Gold and mineral exploration is likely not on the agenda there any time soon.

Despite this remoteness, in the discipline of Landscape Ecology it is understood that all landscapes are truly embedded, linked and telecoupled with other processes, namely human ones (Liu et al., 2018). Over the last 100 years or so, the area received its fair share of missionaries trying to make the area 'peaceful'—god's eden—but then filling it with their own ideology leading to cultural loss and such an onslaught (Beehler & Laman, 2020 for general details).

Living in the Anthropocene, such examples where those connections among the community at large actually work out are quite rare these days (see for instance the CAMPFIRE project in Africa but that ran dry though, Taylor, 2012; or see the Annapurna Conservation Area in the Hindu Kush-Himalaya; Prajapati et al., 2020); PNG seems to have here one of those rel. stable areas while wider infiltrations occurred such as missionaries, explorers, trading and warfare (local, WW1 and WW2; Table 20.2).

**Table 20.2** List of selected landscape aspects in Papua New Guinea that await their detailed description contributing to world's unique places and conservation

Landscape	Description details and justification	Citation
Coastal orchid-scape	Orchids and their conservation in the landscape	Orchid society of Papua New Guinea (2006)
Steep slopes	Likely widely unsurveyed due to access constraints	See Laman and Scholes (2012) for birds of Paradise focus
Seagrass beds	Major site for spawning, fish and sea turtles	
Cloud forests	Major site for endemics	Tree Kangaroo conservation program 2018 for an example
Grasslands	Major sites of human civilization	See for instance Matthiessen (1987)
Sand beaches	Erosion monitoring due to sea level rise	Huettmann pers. com
Old-growth rainforest	Last areas left for sustainability widely untouched by physical disturbance	Beehler and Laman (2020)
River headwaters	Essential ridge-to-reef aspects	Huettmann per. com

**Table 20.3** List of selected explorers of Huon Peninsula where YUS is located

Exploration	Topic	Citation	Comment
Leahy brother	Internal southern Papua New Guinea, widely unexplored at its time	Willis (1969)	Touched on southern Huon Peninsula watersheds but leaving most of YUS unexplored
Colonial Germany	Explorations	NA	Little effort, just coastal and almost none in the interior; likely rivers nearby
C. Schmitz	Anthropology	Schmitz (1960)	German research
J. Diamond	Birds	Diamond (2011 and earlier citations within)	Several initial collection and study sites

## 20.2 What is YUS: A Baseline

The Huon Peninsula is a high mountainous area (Finisterre Range) with steep slope habitats connecting to the coast (Laman & Scholes, 2012). It had a human presence for thousands of years (Groube et al., 1986). YUS has received western contact for over 400 years, namely by the Australians and later by some Japanese and allied soldiers during WW2 (mostly coastal and along major rivers; Duffy, 2016). Interest in gold remains a driver to this very day, specifically in the wider area close to YUS like the connected Markham River watershed. While YUS was little driven by colonial Germans, it still was a bit perforated from the German-dominated coast through the trails to the jungle and highlands. During WW1, it was handed over from the Germans to Australia but invaded by Japan. And YUS became an area of major interest during WW2 during the wider ‘Finisterre Range campaign’ where the Japanese-Australian battle played a big role for the control of the ‘Pacific Theater’. The Markham River villages near Lae got described by Robinson (2017) and others through (escaped) soldiers and with ‘spies’ on either side (Japan and allied troops; mostly Australia and U.S.). Some traveled through YUS.

After WW2, it received the construction of the largest bridge at the time (1955). But till then, not so much has happened in YUS, which must be seen as amazing and considering the booms-and-busts ongoing in other parts of PNG and nearby, e.g. Wau area (see Sinclair, 1978 for relevance of air traffic for those gold mining operations). A few airstrips were done for village exchange, later for coffee trade.

YUS is also characterized by many earthquakes, sometimes more than 10 earthquakes a day and which one can easily feel when being there. A certain danger comes with it, as landslides can get triggered by them and people have been killed by them at slopes. I have personally witnessed those events and impacts.

YUS and its mountainous landscapes and the cloud forests were already studied by J. Diamond and got some fame for the Matschie’s Tree Kangaroo (e.g. Montgomery & Bishop, 2006). Nowadays, YUS is essentially a missionarized “conservation area

with a small coffee production pursued and likely growing” (details in Montgomery & Bishop, 2006; Beehler & Laman, 2020).

What made YUS famous is that the conservation area consists of landowners who donated and pledged their land for tree kangaroo protection and habitat (details in Dabek & Wells, 2021; Montgomery & Bishop, 2006). This creates a unique, otherwise globally rarely found wildlife protection cooperative type. It’s fueled by people of PNG and some NGOs and the coffee production within. As the tree kangaroos live primarily in the higher ranges and peak areas, it’s an area where most people are not really going. Apart of climate change, it thus remains a naturally protected area, consisting of a unique and large endemic habitat and species.

The area then got mapped out (“gazetteer”) and later was re-done with a revision and then that concept got put to work (Dabek & Wells, 2021). The efforts benefitted from missionaries who presented already the hunting of tree kangaroos as a sin (something like “*Jesus never hunted tree kangaroos and so should not you*”). This gospel is now also taught in local school curricular (=replace math with conservation); it has a public impact on the landscape (details in Montgomery & Bishop, 2006).

The area is actually monitored using ‘rangers’ which regularly walk the trails and record any hunting and potential poaching problems in the area and villages (Delie, 2015; Montgomery & Bishop, 2006). The rangers are vested. This makes for a unique, somewhat ancient patrolling concept applied to wildlife conservation; apparently, it’s rather successful.

### 20.3 Where YUS Currently ‘is’

The YUS landscape is somewhat hidden and thus a bit overlooked, and that’s likely one reason for its protection. It’s a certain ‘gem’ hidden from major developments and out of sight. It’s currently on the edge of developing, and many avenues of making money are tried and pursued, most do not work yet. Still, YUS and its geography have a unique position for ‘ridge to reef.’ That’s because YUS is not only connected well with the coast, it’s also part of a mountain range and its plateaus, valleys, steep slopes, grasslands and extensive cloud forests. Much of the vegetation remains vast and in a natural state; indeed, it’s one of its last pristine places on earth (Laman & Scholes, 2012) (Fig. 20.1).

### 20.4 A Unique but Quite New Connection with YUS, Religion, Science and Coffee

Like many places in PNG, YUS lived for over 97% of its time untouched by the western world. But upon contact, it got missionized early on. By now, missionary groups like Seven Days Adventists dominate many villages and the flying schedules; the area is pretty peaceful but affected by wider gang conflicts in the city regions.



**Fig. 20.1** Rugged terrain with virgin forests, gardening patches, a network of villages, trails and some grasslands. The YUS landscape is occupied for millennia and a rather sustainable human high civilization

Western people enter frequently, namely medical doctors, nurses, linguistic scholars, zoo scientists and Australian researchers.

But the advent of coffee has changed the lives of PNG and many farmers lost their skill and expertise for a cash crop which made everybody poorer at the end (Cousteau & Richards, 1999, p. 90; Baraka, 2001). This pattern is also unfolding in YUS. The YUS area is prime recipient area for organic product companies looking for pristine supply chains abroad but based in the U.S. such as Café Vita (<https://www.caffevita.com/>). While YUS is near the coast, coffee is still flown inland to Goroka for the highland sellers and traders; YUS itself is hardly growing in this deal but its resources taken out and the older (mining) hubs get re-inforced; a colonial game.

## **20.5 How About the Role of Remoteness, Spirituality, the Cost of Fuel as Well as the Global Market and Its Repercussions? Can the Pink Disease and Coffee Bean Borer Destroy It All?**

Perhaps a reason why YUS was so peaceful is simply because it is so rugged and inaccessible, and thus of little relevance to The West? It's easy to be spiritual in



**Fig. 20.2** A human-dominated but quite sustainable landscape with gardens, hunting zones, edge fragments, fire patches and some virtually untouched wilderness taboo areas



**Fig. 20.3** Fire plays a role in virtually any human society





**Fig. 20.4** A village in YUS

YUS. Protection by remoteness is for real. Those areas are often a National Park (but which is unlikely a suitable concept for PNG though with living lands in public land tenure). But remoteness is not everywhere equal, and travel routes exist in the area already for millennia; bush airport hubs are now the YUS centers. Those tend to bring in goods, trading items and people; not all come without dispute. One can watch it on facebook.

Another factor for the conservation success could be the dominating religion, which is a peaceful but dominating one wiping out ancient cosmologies. It argues for instance that the bible, and Jesus, never hunted tree kangaroos; thus, nor should any Christian in YUS! In the meantime, remote pockets remain with the usual PNG nature believes, sorcery included. YUS offers many facets of live. Hunting dogs remain to be used; some run free and leave a ‘footprint’.

And third, what do global markets do? Are they helping YUS? Is the coffee bean and fuel price in support of good sales, income, local wealth and access? As global experiences for PNG commodities showed us, those forces are not to be trusted much (see various chapters of this book). Arguably YUS follows a wider destructive trend but is just behind in time and thus impacts are not so obvious, yet but are to come. A good fact on this trend are the mentioned coffee diseases which are threatening YUS coffee now.



**Fig. 20.5** An ancient trail connecting coastal areas of Northern Papua New Guinea with interior Huon Peninsula and the highlands

## 20.6 YUS Outlook

Coffee has its issues; one is diseases (e.g. coffee borer) another is seasonal labor, and another one is the land demand. It also connects remote PNG directly with downtown Seattle/U.S. or Hamburg/Germany, where PNG coffee is often roasted and consumed for much higher value and money. It can be an organic independent roaster product. More demand for coffee will push pressure on hiking and road development which will enter this 'pristine' paradise and affect it.

And likely it will not end with the coffee once a good infrastructure is in place. Although not well studied, man-made climate change will knowingly bring changes and push up vegetation and diseases. It will likely result into the decay of the cloud forest habitat sooner or later. That's because many fitting examples



**Fig. 20.6** Water, forests and people; what can be better than taking a ‘splash’ as done for thousands of years; it’s ancient

of village development after the gold rush can be found—good or devastating (see chapters of this book) but all with massive changes into the modernity—see for instance <https://www.businessadvantagepng.com/how-one-town-in-papua-new-guinea-found-life-after-the-gold-rush> (Figs. 20.2, 20.3, 20.4, 20.5, 20.6, 20.7, 20.8, 20.9 and 20.10).



**Fig. 20.7** Moss-loaded cloud forests in the upper section of YUS, app. 3000 m above sea level; a world heritage



**Fig. 20.8** Chasing tracks of a Tree Kangaroo



**Fig. 20.9** Influence of the church on landscapes has been, and remains, rather big in YUS; a well-maintained religious rectangle in the ancient wild landscape



**Fig. 20.10** A sunday afternoon past time: village rugby with competing village teams

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