‘Our happy hour became a hungry hour' logging, subsistence and social relations in Solomon Islands

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‘Our happy hour became a hungry hour’: Logging, subsistence and social relations in Solomon Islands

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HIGHLIGHTS

- Rural people’s voices are rarely heard in forest policy and science.
- In Solomon Islands, logging rents remain with foreign companies and political elites, and hardly trickle down to rural communities.
- Local benefits of logging are minimal and ephemeral, whereas the environmental and social costs are significant and long-lasting.
- Addressing the negative impacts of logging on subsistence livelihoods and social relations needs to be prioritized in forestry policy.
- Particular attention is needed for the harmful impacts on women.

SUMMARY

Solomon Islands has relied on highly unsustainable industrial logging since the 1980s. While the development narrative around logging emphasizes its macro-economic importance, it structurally overlooks the impacts on local people’s lives. Based on 200 qualitative interviews conducted in 25 villages and 14 logging operations in Malaita Province between 2016 and 2019, this paper demonstrates that the impacts of logging on subsistence and social relations are systemic rather than incidental. By making use of interview quotes, the paper gives voice to rural Solomon Islanders. The results show that the logging industry fails to generate lasting local benefits, while unsustainable logging practices undermine subsistence livelihoods, especially fisheries. Logging triggers conflict that long outlasts the operations themselves, causes sexual exploitation, facilitates excessive alcohol use and reinforces gender disparities by structurally excluding women from decision-making and benefit-sharing. This paper calls for a stronger focus on the social impacts of logging in forestry science, policy and practice.

Keywords: extractive industries, social impacts, Pacific, rural development, gender

«Notre aubaine est devenue l’heure de la faim»: coupe de bois, subsistance et relations sociales dans les Îles Salomon

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Les Îles Salomon sont devenues dépendantes d’une coupe de bois absolument non-durable depuis les années 80. Alors que la narration du développement portant sur la coupe de bois souligne son importance macro-économique; elle ignore structurellement les impacts de celle-ci sur la vie des populations locales. Ce papier se base sur 200 interviews qualitatives menées dans 25 villages et 14 opérations de coupe de bois dans la province du Malaita, entre 2016 et 2019, et démontre que les impacts de la coupe du bois sur la subsistance et les relations sociales sont systémiques, plutôt qu’accidentels. En faisant usage de citations provenant des interviews, le papier donne voix aux habitants ruraux des Îles Salomon. Les résultats montrent que l’industrie de coupe du bois échoue dans le domaine d’une création de bénéfices locaux durables, alors que les pratiques de coupe non-durables sapent les revenus de subsistance, particulièrement ceux de la pêche. La coupe enflamme un conflit qui perdure bien au-delà des opérations mêmes, causant une exploitation sexuelle, facilitant la consommation excessive d’alcool et renforçant la disparité entre les sexes, en excluant les femmes des prises de décision et du partage des bénéfices. Ce papier réclame qu’une concentration plus forte soit portée dans la science de foresterie, la politique et la pratique, sur les impacts sociaux de la coupe de bois.

‘Nuestra hora feliz se convirtió en una hora del hambre’: la tala de árboles, la subsistencia y las relaciones sociales en las Islas Salomón

T. MINTER y J. van der PLOEG

Las Islas Salomón han dependido de una tala industrial altamente insostenible desde la década de 1980. Mientras que la narrativa del desarrollo en torno a la tala de árboles enfatiza su importancia macroeconómica, estructuralmente pasa por alto los impactos en las vidas de la población local. Sobre la base de 200 entrevistas cualitativas realizadas en 25 aldeas y 14 operaciones de tala en la provincia de Malaita entre 2016 y 2019, este artículo demuestra que los impactos de la tala en la subsistencia y las relaciones sociales son sistémicos y no fortuitos.

Mediante el uso de citas textuales de entrevistas, el artículo da voz a los habitantes de las zonas rurales de las Islas Salomón. Los resultados muestran que la industria maderera no genera beneficios locales duraderos, mientras que las prácticas de tala no sostenibles socavan los medios de subsistencia, especialmente la pesca. La tala desencadena conflictos que duran mucho más que las propias operaciones, provoca la explotación sexual, permite el consumo excesivo de alcohol y consolida las disparidades de género al excluir estructuralmente a las mujeres de la toma de decisiones y del reparto de beneficios. Este artículo hace un llamado a que se preste más atención a las repercusiones sociales de la tala en la ciencia, la política y la práctica de la silvicultura.

INTRODUCTION

Tropical timber concessions are predominantly situated in forests that are inhabited or surrounded by forest-dependent people (Asanzi *et al*. 2014, Counsell *et al*. 2007, Lescuyer *et al*. 2012, Ndoye and Tieguhong 2004). The importance of forests for such populations in terms of food provisioning, cultural identity, health and income is well-established (Arnold *et al*. 2011, FAO 2017, Karjalainen *et al*. 2009, Wunder *et al*. 2014). Moreover, tropical timber tends to be harvested from areas characterized by remoteness, poverty, limited government presence and poor delivery of basic services and justice (Chomitz *et al*. 2007, Counsell *et al*. 2007, Headland and Headland 1997, Mousseau and Lau 2015, Persoon 2000, Watson 1996).

Given the combination of concession residents' high forest-dependency and high socio-economic vulnerability, it is essential to understand how local populations are affected by industrial logging operations. However, the social impacts of industrial logging remain under-researched and poorly addressed (Cerutti *et al*. 2014).

So-called 'South Sea wood' has become a major component of international tropical roundwood flows over the past decade. The International Tropical Timber Organization (ITTO) puts Papua New Guinea at the top of tropical log exporters, followed by neighbouring Solomon Islands (ITTO 2019). In both countries, roundwood is predominantly sourced from customary-owned, standing forests, which also form a major source of subsistence and cultural reproduction (Global Witness 2018, Mousseau and Lau 2015).

Especially in developing economies, the forestry sector's contributions to national and local income through export revenues, taxes and jobs is the foremost argument to legitimize a heavy reliance on the logging sector (Charnley 2005, Slee 2006). Often-cited calculations by the Food and Agriculture Organization of the United Nations (FAO) put the contribution of the formal forest sector at almost 1% of global GDP ($600 billion), and the number of jobs it directly and indirectly creates at over 45 million (FAO 2014, FAO 2020, see also World Bank 2016). In an analysis of 2011 economic data for 58 countries that together account for the great majority of roundwood production, Li *et al*. (2019) arrive at similar employment figures and compute that the sector directly contributes over $579 billion to these countries' national GDPs.

For four decades, successive Solomon Islands government administrations have used these macro-economic arguments to legitimize a heavy dependency on the logging sector (Allen and Porter 2016, Bennett 2002, Frazer 1997, Hunt 2019). Well-documented concerns over widespread unsustainable and unregulated logging practices have been acknowledged (e.g. Dauvergne 1998, Global Witness 2018, Kabutaulaka 2000, LALSU 2015, Pauku 2009, Sinclair Knight Merz 2012: 25, SPREP 2019, Toki *et al*. 2017), but are simultaneously side-lined by the dominant narrative that it is logging that keeps the economy afloat (CBSI 2016, 2017, 2018, 2019, 2020, Pauku 2009, SIG 2016, IMF 2020).

However, figures on the sector's actual contribution to government revenue are inconsistent, ranging from as much as 50–60% (MOFR 2017: 16), to 18–20% (IMF 2020: 14, World Bank 2017: 71). Moreover, as a result of both institutionalized tax-exemption measures and tax evasion, under-pricing, under declaring, illegal operations and logging companies' erratic payment of fees, the sector's economic contribution falls far below what it could and should be (ADB 2012, Allen 2008, Bennett 2002, Farran 2016, Global Witness 2018, Laungi 2018 a, b, Porter and Allen 2015, World Bank 2017). Similar issues have been documented for neighbouring Papua New Guina (Mousseau and Lau 2015, Scudder *et al*. 2019). Despite these problems, the discourse on the viability of the logging sector continues to focus on its macro-economic benefits and on the reforms necessary to maximize these (e.g. IMF 2020).

Meanwhile, there have long been serious and country-wide concerns regarding the local level social impacts of logging (e.g. Allen *et al*. 2013, Bennett 2002, Dyer 2016, Farran 2016, Frazer 1997, John 2017, Herbert 2007, Kabutaulaka 2000, Moore 2004, Raomae 2010, Roughan 1997), but these remain largely outside the scope of the policy debate on the future of logging in Solomon Islands. As will be specified and demonstrated below, social impacts are everything that affects or concerns people as the result of a planned intervention (such as logging operations) (Vanclay *et al*. 2015).

In a country where nearly 75% of the population live in rural areas (NSO 2020: 7), and are economically and socially reliant on forest and marine ecosystems, the everyday realities of people in logging concessions must be part of the policy debate on forestry. While the value of logging is usually approached from a macro-angle, this paper follows Asanzi *et al*. (2014) in taking a micro-perspective. That is, it asks: what does logging mean for rural Solomon Islanders' livelihoods and social relations? In answering that question, this paper specifically aims to give voice to local people's experiences, which are public knowledge[1], but remain largely neglected in forestry policy and science.

[1] Watch for example this 'Logging in Solomon Islands Rap' made by John Patteson Ngalihesi, a student of the University of the South Pacific in 2020: https://www.youtube.com/watch?v=pM-ETSkdVxI

LOGGING IN SOLOMON ISLANDS AND MALAITA

The Solomon Islands' logging sector revolves around the export of unprocessed round logs, 95% of which are destined for China (Global Witness 2018, Sinclair Knight Merz 2012, World Bank 2017), with the main export species being *Pometia* (Akwa), *Calophyllum*, and *Palaquim* (Pencil cedar). The sector is dominated by Malaysian logging companies (World Bank 2017), which operate on customary-owned land throughout the country. They can only do this through a licensee, a Solomon Islander who negotiates a logging agreement between the logging company and customary right holders (LALSU n.d.). Operations last between several months and a few years.

The Ministry of Forestry and Research (MOFR) and the Ministry of Environment Climate Change, Disaster Management and Meteorology (MECDM) are mandated to regulate the logging sector. The Forest Resources and Timber Utilization Act (FRTUA) (MOFR 1984), the Environment Act (SIG 1998), the Code of Logging Practice (SIG 2002) and the recently endorsed National Forest Policy (MOFR 2020) form the legal and policy basis for doing so. The FRTUA, which has long been known as 'a complex, unwieldy instrument' with 'potential for misinterpretation' (ADB 1998: 53), is currently under review. This is not the first attempt to come up with more effective legislation: both the 1999 Forest Act and the 2004 Forest Bill were drafted but never enacted (Allen 2008: 286–7) 'because the logging lobby perceived it to be against its interests' (Baines 2015: 2).

Logging happens virtually without oversight. License application requirements, including environmental impact assessments and consent procedures, are cut-short or foregone and environmental safeguards are neglected (Allen 2008, Allen and Porter 2016, Farran 2016: 189, Frazer 1997, Global Witness 2018). As a result, the forests of Solomon Islands have long been systematically overharvested (ITTO 2019, Katovai *et al*. 2015, 2021, MOFR 2020, World Bank 2017).

Malaita

Large-scale logging operations on the island and province of Malaita took off in 1982 (Frazer 1997). Logging especially intensified in the period leading up to and during the 'Tension', the civil conflict that lasted from 1998 to 2003, and resulted in the eviction of 35,000 migrant settlers (mostly Malaitans) from Guadalcanal, and the breakdown of business and infrastructure (Allen *et al*. 2013, Bennett 2002). Between 2015 and 2019, the number of logging companies operating on the island increased from 17 to 21 (Kirrau 2016, Saeni 2019). While their concessions are often located adjacent to each other, there is no mutual use of road infrastructure or log ponds (stockpiling sites for logs awaiting shipment).

Malaita is the second most-densely populated island and province, with a total population of 173,347 as of 2019. Up to 96% of these people live in rural areas, in villages spread out mostly along the coasts, and to a lesser extent in the mountainous forest interior. The remaining 4% live in the only urban centre and provincial capital, Auki, which houses the provincial government as well as a bank, a market and grocery stores (NSO 2020) (Figure 1).

Villages typically consist of a combination of houses entirely constructed from forest materials (sago and bamboo), and plank-walled houses with galvanized iron roofing. For drinking water, nearly half of Malaitans (48%) depend on unprotected, open sources, while another 41% rely on pipes leading down from an uphill water source in the forest to communal taps in the village[2]. Sanitary facilities are largely absent, with 71.5% of Malaitans practicing open defecation (MHMS 2015). Outside the urban centre of Auki, people depend on solar panels and batteries for electric power, which not everyone can afford. Road infrastructure on the island is very limited (Hobbis 2019), and for transport between villages as well as to and from Auki, people depend on open public trucks, irregular ferry services and small boats.

Forest and marine environments are vital for rural sustenance (Posso and Clarke 2014, Schwarz *et al*. 2013). Most people subsist on a combination of fishing and cultivation of root crops, vegetables and fruit trees in swidden fields. Garden crops are supplemented with both wild and semi-cultivated nuts, roots, leaves, fruits and fungi collected from the forest. Hunting of birds, bats, possums and rodents and the collection of frogs, lizards, insects, freshwater snails and molluscs is additionally important, especially for inland communities. The forest further provides the timber, bamboo and canes needed for housing (Moore 2017, Kwa'ioloa and Burt 2001, Ross 1973).

Local exchange of fish, garden and forest products is common, as is the sharing of food among closely related families. At the same time, 'subsistence affluence', the term previously used to describe the relative food abundance enjoyed by peoples inhabiting the islands of Papua New Guinea and Solomon Islands (Connell 1978, Ross 1973) no longer captures the contemporary context (Yari 2003).

Cash is increasingly important for purchasing goods in the provincial or national capital, for paying for food, transport, communication, education and consumer goods. However, opportunities for earning money in the rural areas are scarce, and while remittances from relatives working in urban centres or abroad are to some extent part of the rural cash flow (Posso and Clarke 2014), they do not provide structural support. It is in this context of 'poverty of opportunity', a situation where people are trapped in a narrow confine with little opportunity for change or development (Lightfoot and Ryan 2001), that logging may seem an attractive opportunity. Indeed, logging is surrounded by the promise of 'big money', mostly because of the royalties that are supposed to come with it.

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[2] A further 8% of Malaitans obtain water from rain tanks, while 3% (mostly urbanites) receive water in private taps in the house, or use bottled water or water trucks (MHMS 2015).

FIGURE 1 *Malaita island, showing the provincial capital Auki and the research areas*

Collective landownership

Throughout Malaita, 12 distinct languages are spoken and people strongly identify with their cultural-linguistic group and the associated region, although many kinship links exist between them (Burt 1994, Moore 2017, SIL 2009). Individuals claim membership to patrilineal clans (commonly referred to as 'tribes'), each of which consists of the descendants of one single couple of ancestors, who are considered to be the clan area's original settlers. Not only is this area, which usually comprises both forest and coasts (including reefs), a main source of subsistence, it also contains sacred sites, which are central to ancestor worshipping practices that exist side-by-side with various forms of Christianity (Burt 1994).

The clan area is the collective property of all clan members, who refer to themselves as 'landowners'. The collective nature of land and resource ownership has important implications for logging, and in particular for decision-making processes and benefit sharing. However, who can legitimately claim to be a landowner in a certain area, and who, as a consequence thereof, is to be included in decision-making and logging royalty payments, is in many cases highly complex, context specific and deeply contested (Farran 2016).

METHODOLOGY

This study took an ethnographic approach, using qualitative interviews to document how logging operations change concession residents' lives in terms of cash income, basic services, livelihoods and social relations. Just over 200 people (99 men and 102 women) from 25 villages were interviewed between November 2016 and December 2019. Together, these people provided information on 14 logging operations. By taking a qualitative approach in multiple sites, the data generate insights into the social impacts of logging that go beyond specific locations and individual experiences and allow us to determine if certain impacts are systemic, rather than incidental.

Most logging operations on Malaita take place in the region of Are'are (Figures 2 and 3), which is the main study area for this paper. In addition, data on logging operations that took place prior to and during the 'Tension' were collected on Manaoba Island in north Malaita, and around Bina Harbour (Figure 1). Research sites were purposively sampled (Morse *et al*. 2002) to represent both past and ongoing operations, as well as both coastal and inland sites.

While this paper is primarily based on empirical data generated inside logging operations, it has also been informed by qualitative interviews on logging and rural development with staff from government institutions (notably the Provincial Government of Malaita, MECDM, MOFR, the Ministry of Fisheries and Marine Resources and the Ministry of Women, Youth, Children and Family Affairs), and national and international civil society organizations, including WorldFish, Vois blo Mere (Women's Voice), the Mothers' Union, World Vision and Transparency International. Furthermore, research design, data collection and analysis were informed by review of the scientific and policy literature, as well as by national

FIGURE 2 *Are'are region, showing larger villages and specific sites mentioned in the text*

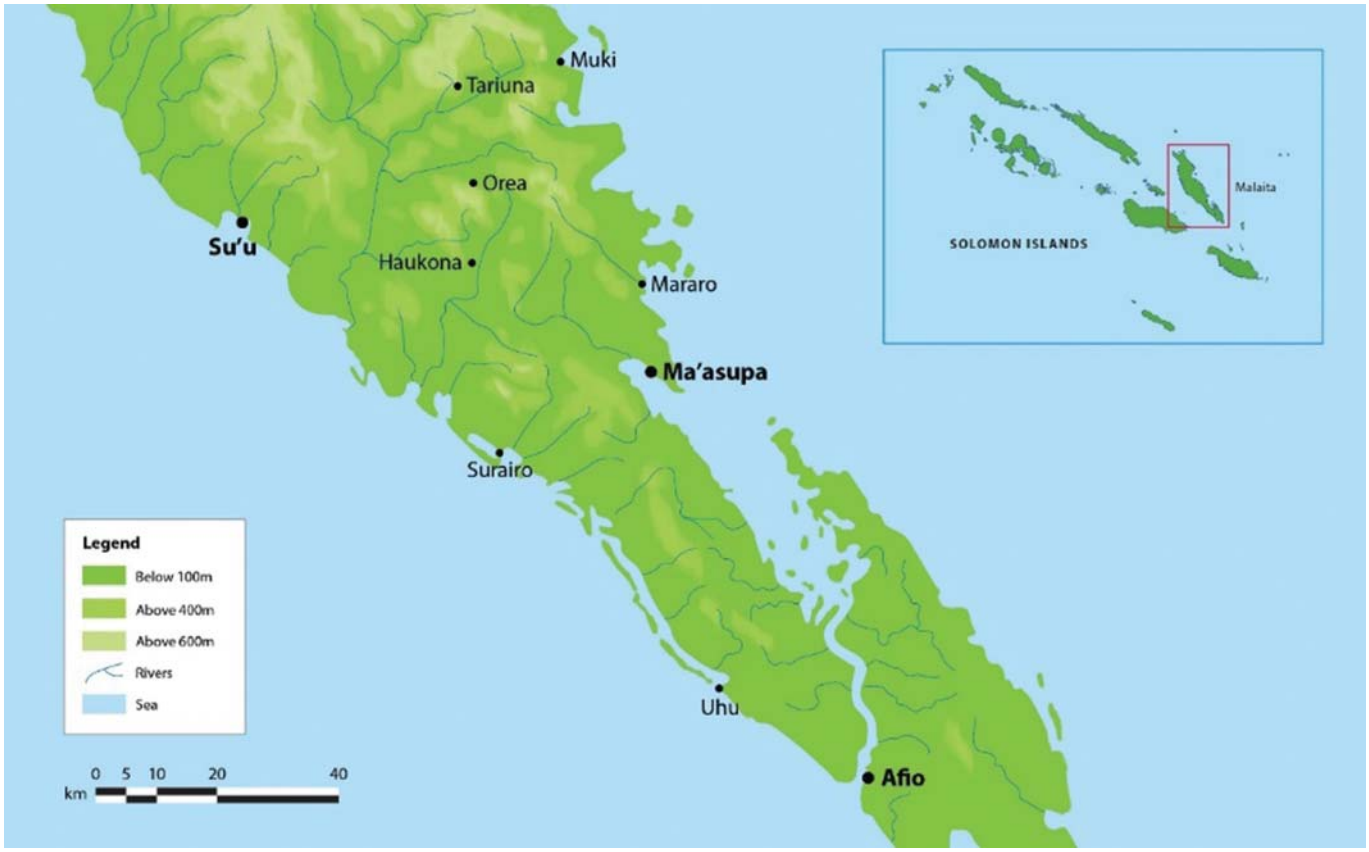


FIGURE 3 *People crossing a log pond in in West Are'are (Minter 2017)*

and international media coverage on the research subject. This paper thus is the result of an iterative-inductive process, in which there is a constant moving back and forth between theory, analysis, data, interpretation and writing (O'Reilly 2012a).

Ethics and consent

Field work for this study was conducted under a research permit granted by the Solomon Islands Ministry of Education and Human Resources Development and with ethics approval from the European Research Council under the Horizon 2020 programme. The study was further designed and implemented in line with the European Code of Conduct for Research Integrity (ALLEA 2017) and the Principles of Professional Responsibility of the American Anthropological Association (AAA 2012).

In line with the above guidelines, as well as following additional principles for working with forest-dependent communities (Persoon and Minter 2011), in each research site consent was first sought from the relevant customary authorities, usually the village chief and clan leader. In some cases, they decided to call residents together, in order for the principal researcher to explain the aims and process of the study, and for people to ask further questions. During these gatherings Solomon Islands Pidgin, the national lingua franca, was used, which was in some cases translated in the region's language by locally-hired assistants. In addition, information sheets explaining the study purpose in Solomon Islands Pidgin and providing the contact details of the principal researcher were disseminated.

Prior to each interview, the study aims and process were explained once more and permission to ask questions and note down answers was sought from individual interviewees. Immediately following the interview, the principal researcher double-checked whether the interviewee still agreed that the information provided was included in the study and the option to withdraw was explicitly given.

Data collection

Data were collected through qualitative interviews, combined with on-site observations in order to contextualize and triangulate the information generated. Interviews and observations took place in villages, on log ponds, in logging camps, at felling sites and during gardening and fishing activities. Depending on the situation and informants' preference, interviews were held individually or in small groups. In the analysis, information was always traced back to individual informants.

As is common in ethnographic research, the types of interviews used in this study range on a continuum from semi-structured to open, with many interviews containing

elements of both (Firmin 2012). Which type of interview was most appropriate depended on the aim and setting of the interview, and the expertise and interests of the interviewee.

For example, when talking about the general characteristics of logging operations (e.g. its history, duration, ownership and staffing) with village leaders or operation managers, a short list of predefined questions was used to collect basic information that was needed to compare operations across sites. Similarly, when speaking with interviewees about employment and income in logging operations, that part of the interview was semi-structured, including standardized questions about the period and type of employment, working hours and remuneration.

In contrast, (parts of) interviews that addressed more complex or sensitive subjects, such as royalty payments, conflict, or sexual exploitation, required a more open-ended and interviewee-led mode of interviewing (Firmin 2012). In such cases, questions asked were guided by topic lists, which evolved based on new insights that emerged as the research progressed. In these in-depth interviews, probing (asking follow-up questions) and free-listing (encouraging informants to provide examples of a certain phenomenon) were key interview techniques to generate both comprehensive and in-depth insights (Morgan and Guevara 2012).

This grounded, inductive approach ensured that interviews covered subjects that were locally relevant, rather than externally determined (Firmin 2012). It also meant that the exact focus of each interview depended on the emphasis that informants put on specific topics, which differed in accordance with someone's specific expertise, experiences and social position. Therefore, the number of interviewees per specific topic varies and is specified in the results.

Sampling and biases

Informants to this study were invited to participate based on the criteria that the sample should reflect: a) gender representativeness; and b) the widest possible range of views and experiences regarding the social impacts of logging (i.e., those of both supporters and critics of logging). The second criterion was emphasized while introducing the study to customary authorities and individual informants. It was also adhered to as much as possible by seeking additional informants until data saturation was achieved, i.e. the moment that no new insights or perspectives on specific topics emerged from interviews in each site (Morse *et al*. 2002). One bias in this respect is that the licensees, who can be expected to point out the positive impacts of logging, were often not present in the concessions and attempts to contact them in other locations were in a few cases turned down. The same applies to several foreign company managers, who refused to be interviewed. Another bias in the sample is the overrepresentation of adults, most of whom had families. The views and experiences of adolescents and children are worthy of a separate study.

Analysis and presentation of data

Interviews were transcribed into English and manually coded by labelling them according to themes (e.g. 'cash income from logging', 'impacts on social relations', or 'impacts on fisheries') and sub-themes (e.g. 'royalties', 'unwanted pregnancies', or 'sedimentation of mangroves'). Specific sections of interview transcripts on the same sub-theme were then regrouped in one file, while keeping the link to individual respondents and research sites intact. For each of these sub-themes, the interview data were then analysed in detail by determining how and by whom it was expressed, and how often and where this theme emerged.

Through this iterative process of close-reading, moving and re-aligning of the data itself, as well as through review of the literature, policy and reflection on above mentioned discussions with professionals, the results were re-grouped into overall themes. Thus, the four domains of impacts of logging that form the structure of the results section (cash income, subsistence, basic services and social relations), are the outcome of this continuous moving back and forth between data, literature and policy (O'Reilly 2012b).

As previously stated, it is a specific aim of this paper to give voice to residents of logging operations. In the presentation of the results, the key themes arising from the data are therefore illustrated with quotes, which are referenced with a respondent number. In the results, the frequency with which certain topics were raised in interviews is given (see Table 1). Given the above-described data collection process, these frequencies cannot be converted to percentages as this would falsely suggest that a particular topic is deemed important by a certain percentage of the population, and by implication unimportant by the rest. Table 1 demonstrates the number of interviews in which a topic was raised, as well as the absolute and relative share of the villages and logging operations where the issue was found.

Figures 7 and 8 were produced by MapHubs following a request by the authors. Log pond data (Figure 7) were collected through OpenStreetMap, complemented with ESA Copernicus Sentinel-2 satellite imagery. This was checked and complemented with prior knowledge on log pond locations provided by the authors, which was verified using Google Earth's imagery archive. Logging roads (Figure 8) were mapped based on an update of earlier analysis[3].

RESULTS: THE SOCIAL IMPACTS OF LOGGING IN MALAITA

Social impacts include all issues associated with a planned intervention (i.e. a logging operation) that affect or concern

[3] See: https://medium.com/maphubs/seven-maps-that-explain-logging-in-the-solomon-islands-7dba7368e69e and https://www.globalwitness.org/documents/19471/Logging_Roads_in_the_Solomon_Islands.pdf.

people, whether directly or indirectly, positively or negatively. They may be experienced either in a cognitive or a physical sense, and at any level: individual, household, larger social group, workplace, community or society. This includes impacts on the environment, livelihoods, health, cultural heritage, well-being, and people's fears and aspirations. In short, anything can potentially be a social impact of a planned intervention, so long as it is valued by or important to a specific group of people (VanClay 2003, VanClay *et al*. 2015). In the following, the four domains of perceived social impacts identified in the ethnographic data on past and ongoing logging operations on Malaita will be discussed. These are impacts on: 1) cash income, 2) subsistence, 3) basic services, and 4) social relations.

Cash income

With cash earning opportunities in rural Malaita being limited, the most-anticipated impact of logging is its promise to generate local cash income. This cash has the potential to come in three main ways: from royalty payments, through jobs and by fuelling other local businesses.

Royalties and other fees

Although this is not legally underpinned, both residents of logging operations and government officials consistently say that royalty shares amount to 15% of the export value of each shipment of logs[4]. 5–10% is the licensee's share, and the remainder goes to the landowners, i.e., those who claim clan membership to the area where the trees were felled. In addition, the licensee and company negotiate various fees for land leased for log-pond and road construction, and for anchoring rights in communal waters. The computations of these fees in most cases lack transparency and are rarely formalized. Moreover, the average landowner has little influence on the negotiations, as is clear from this reflection by a man from Mararo, East Are'are (Figure 2), where an operation started despite local opposition:

> *'Now that the company is here, we should make the best of it. The machines landed on Friday* [March 10 2017]. *On Saturday* [the licensee and land committee chair] *came* [here] *and we told them: "You'd better make sure that you negotiate well with the company, because if not, everything fails for us."* (R5)

The company pays the royalties and fees to the licensee, who then pays the landowners' share to the 'land committee'. This committee (composed of 5–7 people, always men) represents the people who collectively own the forest and coastal areas in which the logging activities take place and is responsible for further distribution of the money to these people. There are two options here.

One option is that the money is invested in communal projects, usually housing. However, although plans for such projects were mentioned in all fourteen logging operations, only two potentially successful examples, in two different logging operations, were observed. Both of these concerned housing projects and both were still ongoing at the time of research. In the other twelve logging operations, the planned projects never materialized and were surrounded by allegations of mismanagement of logging funds. However, criticism of such mismanagement is limited and can easily backfire on the complainants. One committee member, for example, reported how the licensee removed him from a communal housing project after he complained about lack of progress and mismanagement.

Alternatively, the money is paid on a per capita basis to all clan members, but in practice this is equally unsatisfactory. While a small number of informants report to have received one-off amounts ranging from SBD 50 to 500 (USD 6 to 62), most say they have never received such payments as a result of maldistribution and misallocation of royalties. This issue was raised in 51 interviews, and was pertinent to 64% of the villages and 86% of the logging operations (Table 1). Crucially, both women and men consistently say that women typically do not receive payments.

More generally, royalties and other fees are commonly said to be used for short-term pleasures by a select few, rather than bringing lasting benefits to the larger collective of landowners. Accounts of big spending are common in all logging operations visited and are throughout Solomon Islands referred to as *kaikai selen*, literally 'eating money' (see also Dyer 2016). A woman from West Are'are commented:

> *'When the machines work, corruption comes in. Only the committee members benefit from the logging. When our committee chairman received the money, he opened an account for us landowners in Honiara* [the national capital]*, but when he came back all the money was finished to the last coin: it went to motels, drinking and women.'* (R118)

Jobs

Logging companies in Malaita operate on three sources of labour: 1) a foreign workforce of management personnel, technical staff and machine operators from Malaysia, the Philippines and Indonesia; 2) a national crew of chainsaw operators, trimmers and scalers, commonly referred to as 'Solomon Boys'; and 3) local unskilled labour (Figure 4). Based on interviews with operation managers and personnel officers, the number of employees per category were listed for eight recently ended or ongoing logging operations in West and East Are'are. On average, each operation employs 16 foreign, 24 national and 36 local labourers.

[4] Logging companies retain 60% of the log export value, while 25% consists of export duties. Export value is based on FOB (Free on Board) as set in the 'Customs and excise export duty rates for round logs' by the Ministry of Finance and Treasury.

TABLE 1 *Overview of key issues in logging operations on Malaita (2016–2019), showing the number of interviews in which the issue was raised, and the absolute and relative share of villages and logging operations where issues were recorded (F = frequency)*

Key issues raised in logging operations on Malaita grouped by overall theme	**# Interviews in which issue was raised**			**Villages where the issue was raised (n=25)**		**Logging operations where the issue was raised (n=14)**	
	Men	**Women**	***Total***	**F**	**%**	**F**	**%**
Cash income							
Maldistribution and misallocation of royalties	30	21	*51*	16	64	12	86
Subsistence							
Negative impacts on fisheries	39	39	*78*	16	64	7	50
Negative impacts on gardens	14	12	*26*	14	56	9	64
Negative impacts on drinking water	13	7	*20*	12	48	8	57
Social relations							
Conflict between logging company and landowners	19	8	*27*	11	44	9	64
Conflict between and within landowning clans	24	13	*37*	15	60	8	57
Sexual exploitation	25	24	*49*	13	52	10	71
Excessive alcohol use	12	25	*37*	14	56	9	64

FIGURE 4 *Local crew and Indonesian machine operator in West Are'are (Minter 2019)*

Information on local logging employment was collected from 67 people in 45 different households. For each of these households, information on employment in logging was listed by asking if the respondent or any other member of the household was currently or had ever been employed in logging operations. Of these people, 63% were hired for unskilled and low-paid jobs: security guards of machinery in felling sites, and on log ponds or surveyors for road construction and tree felling. A small number of women were hired as cleaners and cooks for the foreign workforce. Only 19% had jobs that required skilled labour, mostly chainsaw operation, or were involved in operation management (18%), which is usually rewarded with a certain amount per timber volume rather than with a regular wage.

Local employment is short-term, ranging from three months to three years, but typically lasting less than a year. Most male employees work 8 hours a day, six days a week, with overtime fees for night- and weekend shifts. Female employees report working up to 13 hours a day, six to seven days a week. Workers indicate that a job in logging leaves them with very little time for subsistence activities, such as fishing and gardening. Most workers are hired on a casual basis and do not receive health or pension benefits. Wages for unskilled labour roughly follow minimum wages. Delays in payment are common and reported to regularly lead to strikes. This was observed twice during the research, in two different operations. Meals are generally not provided for local workers, which results in considerable wage deductions as expensive company stores offer food, mostly instant noodles, canned tuna and rice, on credit.

Local business

Logging operations increase local business to some extent. Log ponds and logging camps function as weekly or fortnightly markets, where women earn between SBD 20 to 300 (USD 2.5 to 37) by selling garden products, fish, shells and cake (Figure 5). Local shopkeepers near logging roads and camps see their sales increase, especially around 'pay-day', but also face competition from logging company shops. Shopkeepers use the logging barges, which make occasional trips to Honiara, to supply their shops. However, as a personnel officer in West Are'are noted, the resulting increase in economic activity is temporary:

> *'When the logging barge arrives then it is all "Rice! Rice! Rice!". That time, some canteens run well, but* [. . .] *the supplies run out quickly. So it is on and off.' (R119)*

In parallel to logging operations, some landowners set-up small-scale sawmilling enterprises, harvesting several timber species that are banned for export. This timber is mostly used for house construction, but some of it is sold in Honiara. These local enterprises also generate income for local chainsaw and sawmill operators, who earn SBD 100 to 150 (roughly USD 12 to 19) per day. Some of these businesses are operated by women, who proudly call themselves 'cubic women' (Saeni 2017a), after the volume unit used to measure timber.

FIGURE 5 *Log pond market in East Are'are (Minter 2017)*

Because these local enterprises are dependent on industrial logging operations for timber transportation, they dwindle as soon as companies retreat. Also, although landowners expect company personnel to offer their machinery and labour to haul and transport their logs and planks, company staff are not always helpful and often demand payments in return. A common complaint by 'cubic women' is that machine operators request sexual favours in return for assistance in log transportation.

Subsistence

The subsistence economy rests on two major activities: fishing and the cultivation of swidden fields planted with root crops, vegetables and fruit trees. In addition, some families have sago palm and coconut plantations, keep pigs[5] or engage in hunting. Daily meals are based predominantly on the products of these subsistence activities, and to a much lesser extent on store-purchased ingredients. The forest and marine ecosystems thus form the basis of rural Malaitans' subsistence. As will be demonstrated below, residents of logging operations observe severe negative impacts on this subsistence basis.

Fishing

Fresh fish provide the majority of animal protein in Malaitan diets. Fisheries are predominantly small-scale, non-motorized and multi-species, with manual shell- and crab-collection, spearfishing and line fishing from dug-out canoes being the main techniques. Fishing grounds consist of mangrove forests, reefs, passages, rivers and creeks (Schwarz *et al*. 2013, van der Ploeg *et al*. 2016).

A variety of negative impacts of logging operations on fisheries were raised in 78 interviews (by 39 women and

[5] Pigs are primarily bred for use in ceremonial activities and compensation payments.

39 men), which were pertinent to 64% of the villages and 50% of the logging operations (Table 1). Informants attributed these impacts to oil pollution, as well as to sedimentation and removal of reefs and mangroves.

Interviewees reported that oil regularly leaks from logging machines, logging barges and fuelling stations, which are positioned at the shore, and that it gets dumped in open water when the logging machinery receives its routine oil change (see also van der Ploeg 2020).

The effect of sedimentation of reefs is another concern for many interviewees. People describe this problem as a layer of soil covering the corals and they attribute this to sediment washing down from felling sites and logging roads[6]:

> *'Fishing inside the bay is a problem now because the mud is covering the corals and some corals die. But the people who like logging, they don't like to listen to us women. They say they don't worry about these things. They like logging, they like development. But what kind of development is this when it damages everything?'* (R131 Woman from West Are'are).

The problem of sedimentation also affects mangroves, which form women's foremost shellfish and crab collection grounds. Given this gendered space, this problem was unsurprisingly more often mentioned by women, than by men (Minter *et al*. 2018). For instance, the gathering of the so-called 'disco-shell' (*Pegophysema philippiana*), which owes its name to women collecting it by wiggling their feet down in the mangrove mud, is said to have become impossible in at least three logging operations in both West and East Are'are because the mudflats have been covered by an impenetrable layer of gravel, soil and oil, washing down from logging roads, which suffocates and kills the shells.

An additional problem is damage to coral reefs as a consequence of anchoring logging barges and log loading, as well as the digging up of corals for log pond and logging road construction. Finally, mangrove forests are regularly cleared to convert them into log ponds (Figure 6). This happens despite the prescription that a 50m buffer zone from the coast is compulsory for log pond construction under the Code of Logging Practice (SIG 2002). Figure 7 shows the high density of log ponds on Malaita, especially in Are'are, where almost all log ponds are created by removing mangroves.

FIGURE 6 *Clearing mangroves for log pond construction in East Are'are (van der Ploeg 2017)*

[6] River banks erode as the prescribed buffer zones (25 m for streams and 50 m for rivers (SIG 2002: 3)) are often disrespected and river beds are damaged by logging machinery as bridges are not consistently and properly constructed.

The effects of mangrove clearing are far reaching, as is clear from this reflection by a mother of eleven children, on how logging company Mega constructed a log pond in the mangroves adjacent to the village of Mararo (East Are'are):

> *'It is a big concern for me that the mangroves are gone because it is the place where I found food. When my children were small, I would go there to find food for all of them: it was close by, so when I heard them cry, I could just go back quickly.* [The mangroves] *also gave the last food to my husband when he was dying. When he was crying for* roropio [mangrove worm]*, I just went there to collect it for him. It was the last thing he ate before he died. So when I saw the machines landing, I felt as if I saw my mother dying. I cried. The happiness, the food and the help that the place gave me, is now gone.'* (R114)

Swidden cultivation

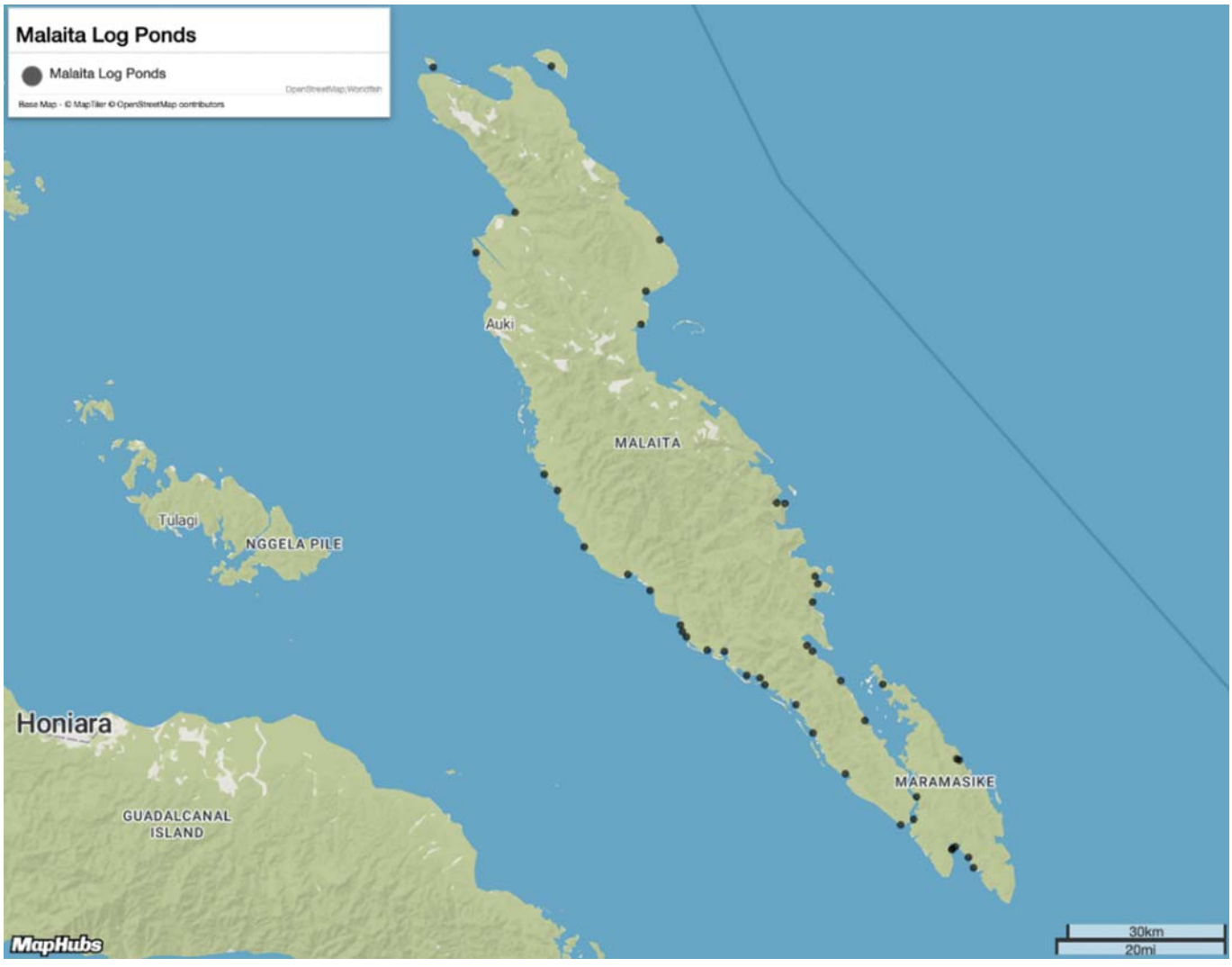
The other core component of rural livelihoods, swidden cultivation, is affected by logging in various ways. During the operation itself, in some logging operations women benefit from hitchhiking on logging trucks for their daily work in the gardens, which saves them a lot of time and energy.

At the same time, the construction of roads, as well as the timber felling process itself causes damage to root crop gardens, pig pens, and to copra, betel nut and sago plantations. This issue was raised in 26 interviews (by 14 men and 12 women) and pertained to 56% of the villages and 64% of the logging operations (Table 1). People frequently request damage compensation, but mostly without result, as was explained by an elderly woman from East Are'are:

> *'Logging came, but to me it is a big problem. The* [logging] *road goes right through some of my gardens. I told the chairman* [of the land committee] *about it and the company said that they will pay* [for the damage]*, but they did not say how much and when. I will have to open up new gardens because even though we can now buy some store foods, I am still not sure that we can eat in the future'.* (R86)

In addition, several respondents reported seeing snails and a growth of weeds that they had not seen prior to logging, and

FIGURE 7 *Distribution of log ponds on Malaita in 2019*



which reduce the productivity of their fields. On Manaoba Island as well as around Bina Harbour, fifteen years after logging has ended, gardens are said to continuously suffer from these pests. As is known from other parts of the country, the transportation of logging machinery facilitates the spread of invasive species, including the Giant African Snail (*Achatina fulica*) (Kiddle *et al*. 2017, Saeni 2017b, Stronge 2016).

Food and water

Logging also has considerable impacts on food and water provisioning. In 20 of the 78 interviews in which negative impacts of logging on fisheries were raised, interviewees spontaneously indicated that these impacts meant that their families eat fresh fish and shellfish less often as compared to before. In the two sites where logging ended twenty years ago, Manaoba Island and the inland areas around Bina Harbour, the effects on fish consumption were said to be permanent. This woman from East Are'are rhetorically asked:

> *'The mangrove area is gone for good. So where should we now find our* supo*,* u'a[7]*,* ke'u *and mangrove fruits? We used to just collect shells in the mangroves for our late afternoon snacks, but our happy hour became a hungry hour!'* (R81)

At the same time, informants consistently reported an increase of consumption of storable food brought in on logging barges, notably rice, canned tuna, noodles, sugar, tea and biscuits. Such imported food is highly appreciated for the variation it brings and for the way it lessens women's work burden: cooking rice and noodles is much less labour intensive than cooking root crops and fresh fish, the preparation of which takes two to three hours per meal (Pollard 1997). Moreover, when rough weather makes fishing impossible, the long shelf life of packaged food makes it suitable as high-calorie emergency food. Furthermore, the imported food is associated with 'progress' and 'modern' life.

In most cases, imported storable food merely complements, rather than completely transforms local diets. However, in situations where households are entirely reliant on logging wages, storable food almost completely replaces local food. A woman from East Are'are reflects on the time that she worked as maid for logging company Sam Lim San, while her father and brother also worked for the company:

> *'That time we did not work in the garden much because my mum's body was not very strong. So it all depended on me and my dad, but we were busy with our work for the company. My brother used to fish a lot, but he also worked for the company so he did not go fishing anymore. If we wanted to eat fresh fish, we had to buy it from fishermen, but we did not do that often. Before logging, we ate fresh fish almost every day, but when logging came it changed to maybe once a month only. During logging* [. . .] [w]*e ate noodles and canned tuna in the morning, in the afternoon and in the evening. We changed from home food to store food.'* (R115)

Logging also has substantial impacts on drinking water. Open freshwater sources regularly get polluted by logging-induced erosion and oil spills. Water pipes and wells often get damaged during logging road construction and felling activities. This issue was raised in 20 interviews (by 13 men and 7 women) and was pertinent to 48% of the villages and 57% of the logging operations (Table 1). Water systems that were broken as a result of logging-related activities were observed in four logging concessions. Interestingly, although this problem disproportionately affects women, as fetching water is considered to be a woman's task, men raised this issue almost twice as often as women. Both women and men indicated that this weighed heavily on women's work burden and that it delayed meal preparation. In several cases it meant that women had to walk further or paddle across open, rough seas to collect water. Damage to water systems by logging companies is a more general problem throughout Malaita, and companies rarely take responsibility for repairs (Pers. Comm. Gloria Siwainao, Provincial Environmental Health Officer, 2018).

Basic services

Despite these negative impacts on subsistence activities, logging also sparks rural Malaitans' hope that it will generate the basic services that the government poorly delivers.

Roads

Roads are the most anticipated of these services, given the limited road accessibility throughout Malaita, In Tariuna, in the interior of East Are'are (Figure 2), enthusiasm about a newly constructed logging road by Rite Trade Pacific in late 2017, was great, as expressed by this young mother:

> *'Before the road came, life was hard.* [. . .] *We women, when we were pregnant we had to walk down to the clinic [. . .] in Manawae* [near Muki]*. Now we can just ride on the truck.'* (R150)

Licensees, land committee members and foreign operation managers actively fuel hope that these roads will literally pave the way for 'development':

> *'There are no long-term benefits from logging yet, but we want to make plans for the future. Road access is really our main aim for the future, but at this stage it's just a dream. We are* [. . .] *in a position to link the* [interior] *to the coastal areas and the towns. We also want the government to assist us in building a school and a hospital. It is only big thoughts right now, the real work must still happen.'* (Male respondent from West Are'are, R124)

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[7] *Supo* (marine snail, *Melanoides sp.*), *u'a* (mud crab, *Scylla serrata*), *ke'u* (mud shell, *Polymesoda sp*.)

> *'Some people do not favour logging because there are negatives, but we come because government cannot fulfil some of its duties.* [. . .] *The company can construct roads. We are also partnering with the government* [for] *a proposed* [. . .] *high school* [and] *a hospital. We can assist by providing machine labour. Whether this will happen depends on the negotiations.* [. . .] *the company and licensee will provide assistance to landowners in a way they see fit. As licensees, our responsibility is to coordinate the operation and to supervise that* [the company] *fulfils the promises made* [. . .] *and at the same time we must make sure that the landowners don't over-use the company.'* (Male licensee West Are'are, R126)

However, although multiple logging roads extend into to the island interior (Figure 8), the long desired connecting roads have not been built. Moreover, poor construction, lack of maintenance and an extremely wet climate, make most logging roads impassable within a year after logging operations end (see also Hobbis 2019).

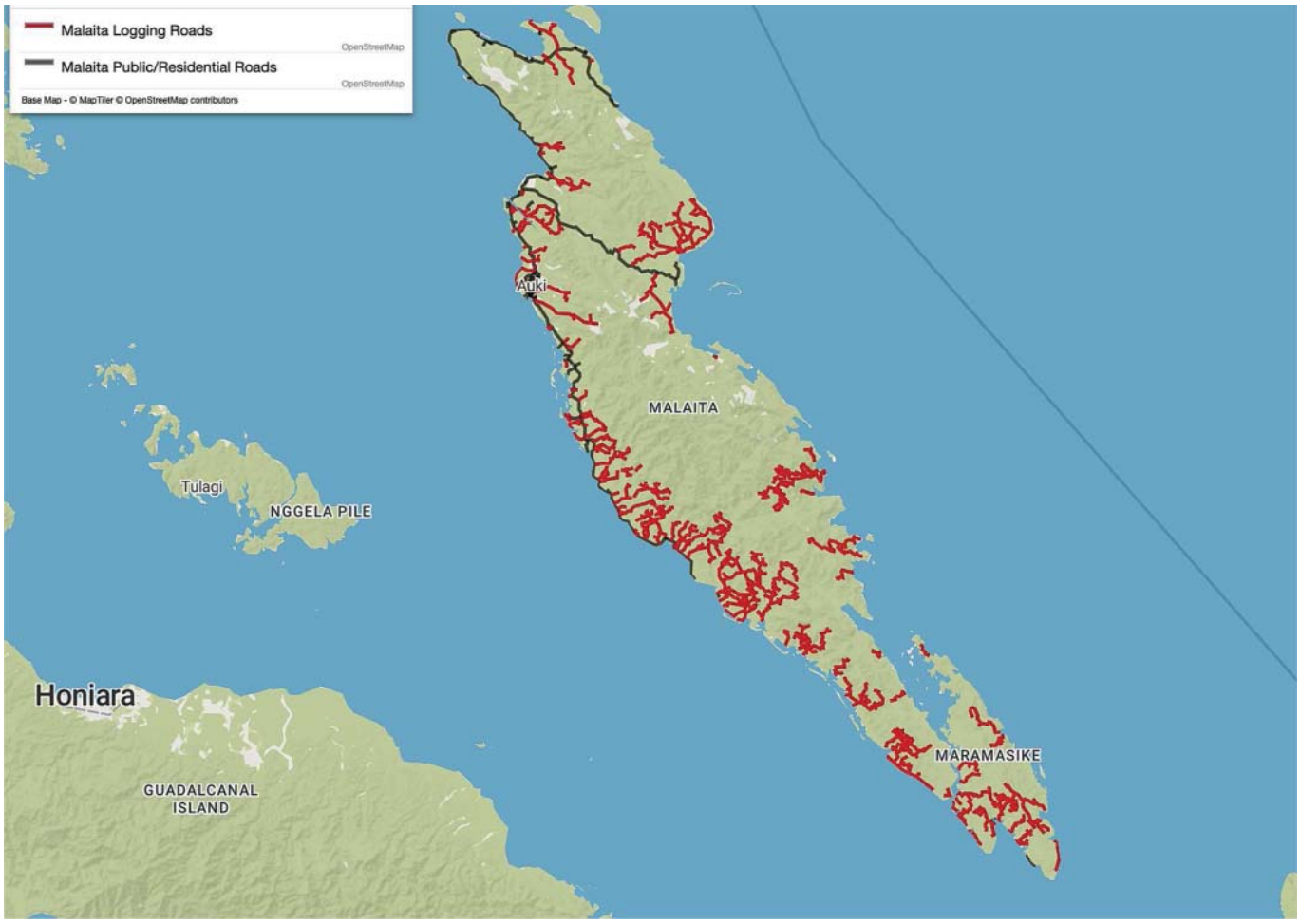
For instance, in 2015 the village of Haukona in the Are'are interior (Figure 2) was connected to a logging road built from the west coast by Rite Trade Pacific. After the company retreated in early 2017, potholes emerged and bridges collapsed. By mid-2018, a young man from Haukona reflected:

> '*We are back to walking. It takes us a full day* [to walk to the coast] *so we don't go down much anymore.'* (R168)

Other development aspirations

The licensee, who is typically a well-educated man residing in Honiara, negotiates with the company about additional benefits on behalf of the landowners. The results of these negotiations are in theory included under the so-called 'Supplementary Conditions' in the Timber Rights Agreement to the logging license, but in practice commonly remain unformalized. Moreover, copies of the agreement are usually only held by the licensee[8]. This lack of transparency makes it hard for landowners to hold the licensee and the company accountable and complicates assessing the legitimacy of landowners' expectations.

FIGURE 8 *Logging roads (red) and public roads (black) on Malaita (MapHubs 2019)*



[8] Additional copies should be kept by the Provincial Secretary (LALSU 2015), but repeated requests by the first author to study these remained unanswered.

Table 2 demonstrates the consistent mismatch between what landowners consider to have been promised by the licensee and logging company, and the extent to which this has been delivered within the duration of the logging operation[9]. As is clear from the right-most column in Table 2, in three logging operations that were still ongoing during the time of research, landowners had been told that their requests would be fulfilled after the next shipment of logs.

Social relations

A recurring theme in observations and experiences of interviewees in all research sites, is the impact that logging has on social relations in village settings. The following reflection by a man from East Are'are provides an apt summary:

> *'I do not know of a single case where logging has not led to conflict.* [. . .] *Logging pollutes the sea, the land, the bush, the river and the relationship between people. Everything touched by logging gets polluted.'* (R4)

Conflict arises in four main areas, namely: 1) Company-clan relations; 2) Clan relations and gendered exclusion mechanisms; 3) Sexual exploitation; and 4) Alcohol abuse. Each of these will be detailed below.

1. Company-clan relations

The triangular relationship between landowners, licensees and companies is reportedly marked by perpetual strife. This issue was raised in 27 interviews (by 19 men and 8 women), and pertained to 44% of the villages in 64% of the logging operations (Table 1). The above demonstrated gap in expectations and realities surrounding benefit sharing is at the core of these tensions, but there are usually additional grievances. A major source of conflict is the damage that logging operations cause to reefs, gardens, pig pens, sacred sites and drinking water systems, for which no effective complaint process and compensation procedures exist. In addition, the frequent delays in payment or underpayment of logging wages and royalties cause tensions. When meetings or strikes remain without result, disagreements sometimes turn violent, as was the case in southern Malaita in late 2015:

> '*It was a very unsafe time. Everyone suffered. The police came to control the situation but they were always at the log pond and were drunk most of the time.'* (Woman from Afio R0)

In this and at least four other operations studied, logging companies responded to tensions with sudden and premature withdrawal, leaving hundreds of untransported logs felled by landowners and companies behind. Paradoxically, licensees then tend to arrange for a new logging company to come in to complete the task, often deepening the cycle of disillusionment.

2. Clan relations and gendered exclusion mechanisms

Second, logging-related conflict within and between clans is widespread. This problem was raised in 37 interviews (by 24 men and 13 women) and pertained to 60% of the villages and 57% of the logging operations (Table 1). Such conflict commonly starts with disagreement over whether or not logging companies should have been granted access to specific lands in the first place, and who has the right to make such decisions on behalf of the clan. Certain groups of people are systematically excluded from decision-making processes, which are based on the contested distinction between 'primary' and 'secondary' landownership rights (see also Allen *et al*. 2013: 21, Baines 2015: 13, Farran 2016: 186).

TABLE 2 *Benefits as negotiated and delivered in 14 logging operations on Malaita*[10]

Benefits	No. of logging operations (n=14)				
	Negotiated	Fully delivered	Incompletely delivered, company left	Not delivered, company left	Pending until next log shipment
Construction of school/kindergarten	10	1	2	4	3
Construction of clinic	2			1	1
Establishment of /improvement to water system	3			1	2
Construction of church	5			4	1
Providing tin roofing	7		1	4	2
Construction of wharf	2		1	1	
Improvement of soccer field	2	1	1		
Levelling village grounds with logging machinery	3			2	1

[9] This table is based primarily on triangulated interviews with landowners, complemented to a lesser extent with interviews with licensees, company officers and on-site observations.

[10] See Minter *et al*. (2018: 21–22) for more detailed accounts per operation.

According to some informants, only 'primary right holders' have culturally defined decision-making rights, with 'primary right holders' being loosely defined as those who can claim descendance from the first settlers in a given land area. In Malaita, married women usually move to the clan area of their husbands, where they are considered to only have 'secondary', or usufruct rights. This then excludes them from making decisions about and receiving royalties from logging in that area. In contrast, other informants argue that there never was a distinction between 'primary' and 'secondary' rights until colonial administrators introduced it in the process of land appropriation for the establishment of government stations. Even so, in practice the 'primary rights' narrative works as a powerful mechanism of exclusion.

Regardless of the above discussion, women are not part of logging-related decision-making and royalty schemes on their birth land either. As a result, many women are critical of logging:

> *'We are* [. . .] *not part of any of the* [. . .] *committees.* [Men] *look at us as if we are not big, they look at themselves as big only. Also, the loggers only talked about the positive side. The licensee* [. . .] *called a meeting* [. . .]*, but they only invited the people who are pro-logging. I went there too because I wanted to know what's going on. I spoke out during that meeting and said that they should also include women in the logging committees, but they did not respond. Some men are open to it, but they did not put it into action.'* (R125, West Are'are)

> *'One thing that I do not like about logging is this. Is it prohibited to let us women be part of the committees or the agreements? Logging comes to everyone, men and women, so why can we not be part of it?*' (R94, East Are'are)

The key moment for obtaining landowners' consent is the Timber Rights Hearing, which is essentially a meeting between the license applicant and representatives of the landowners of each parcel of land, with delegates of the Provincial Government present overseeing the process and acting as the secretariat. While all people potentially affected by the proposed logging are entitled to be informed about the meeting (Farran 2016: 188, LALSU 2015: 81), a common grievance among informants across logging operations is that in practice only people pre-selected by the license applicant are informed and invited. Moreover, even if there is explicit resistance to logging during these meetings, procedures for objecting are complicated, costly and have to happen within a short period of time (one month) (LALSU 2015: 78).

Following these contentious and exclusionary procedures, discord endures during the logging operation itself, when it is usually aggravated by accusations of mismanagement of logging revenues among clan members. The deep rifts this gives rise to can be sensed from this reflection by an adolescent man from East Are'are:

> *'Logging makes life not much good. Before the logging operations the community was at peace, we were united, we worked together, religion was strong. After logging came, these values and others like caring for each other and supporting each other, disappeared and turned the opposite.'* (R21)

3. Sexual exploitation

Logging operations are associated with exploitative sexual relations between incoming logging personnel and local girls and women, which causes deep local resentment. This issue was raised in 49 interviews (by 25 men and 24 women), pertaining to 52% of the villages and 71% of the logging operations (Table 1). It leads to an increase in teenage pregnancies, school drop-out rates, and fatherless children. Logging companies usually prohibit their non-local workers to have sexual relations with local girls, but:

> '*Here in* [our village] *alone we have around five* [babies born from sexual encounters with expatriate logging staff]*, but the fathers are already gone. We have chiefs here, but they don't play their role. They should keep an eye on these things, but they don't. We parents are weak, and the chiefs are weak too* (R133, West Are'are).

In several logging operation, chiefs and village leaders were found to discourage women and girls to ride on logging trucks for safety reasons, which takes away the earlier mentioned advantage of hitchhiking to gardens. And while many mothers forbid their daughters to visit logging camps and log ponds, this is often unavoidable as they have to be crossed on the way to school or gardens. A mother comments:

> '[. . .] *there is security on the log pond, but they don't pay attention to the girls* [. . .]*. They are paid to protect the machines, so that's what they do, but nobody protects our girls.'* (R118, West Are'are).

In addition, both men and women say marital relations often get strained when husbands are employed by the company, because most of the wages are spent at the company store, on alcohol or on mistresses. A former male logging employee speaks from experience:

> *'Many men take girlfriends because suddenly they have money to spend. But as soon as the money is finished, the girlfriends disappear, and by that time he has already lost his wife too. So when the money is gone, he doesn't have anything left in life.*' (R6)

4. Alcohol abuse

Finally, all of these different and intertwined tensions are heightened by increased and problematic alcohol consumption, an issue that was raised in 37 interviews (by 12 men and 25 women), and pertained to 56% of the villages and 64% of the logging operations (Table 1, Figure 9). The sale and consumption of alcoholic beverages on logging companies' premises is generally prohibited, but enforcement is poor.

Moreover, companies facilitate the local sale of beer by allowing its transportation on logging barges to supply village bottleshops. This further increases social disruption at all levels, as was pointed out by this woman from West Are'are:

FIGURE 9 *Residents' attempt to regulate alcohol consumption near a log pond in West Are'are (Minter 2018)*

> *'Alcohol is disturbing the whole community now. Before logging, drinking would only happen when it was time to celebrate, but now it happens Monday to Sunday. The young and the old, everyone drinks and it happens everywhere too. Before, drinking would happen at the edge of the village, now it happens in the middle of it, within the view and hearing of children, who see and hear all the swearing and the fighting.*[. . .] *Women get frustrated too when their husbands spend all the money they earn on beer. So to get it balanced, they also start drinking. And then a lot of fighting happens inside the house and the children don't know where to run to anymore.'* (R125)

DISCUSSION

Logging benefits do not trickle down to rural communities

The Solomon Islands' logging industry has been claimed to significantly contribute to local rural economies through employment, revenues and infrastructure (MOFR 2020, Pauku 2009), but the scant literature on the subject and the data for Malaita presented in this paper show the opposite.

It is estimated that the sector generates 'perhaps' 5,000 jobs nationwide (IMF 2020:14, World Bank 2017), but this figure provides no insight in the nature and duration of such jobs. This study has shown that the number of local workers hired per operation relative to the total population affected is low, employment is highly temporary and insecure, wages are low, payment delays are common, working hours are long and inhibit undertaking other economic activities, and as meals are only provided for foreign workers, local labourers spend considerable shares of their wages on food from the company store.

Similar limited contributions of logging companies to local employment have been demonstrated by Lescuyer *et al*. (2012) for Cameroon and by Asanzi *et al*. (2014) for Zambia. Both studies highlight that most locally generated jobs are low-paid and casual, while better positions and labour conditions are reserved for external workers. In a global literature review on the local benefits of industrial roundwood plantations, Charnley (2005) concludes that the sector does not contribute to substantial employment in rural areas and rarely creates jobs for people who are already politically and economically marginalized.

The results further underscore earlier reports that royalty payments benefit only a few people and do not contribute to structural development (Allen *et al*. 2013, Farran 2016, Frazer 1997, Kabutaulaka 2000). The onus of redistribution of royalties rests on the licensee and the 'land committees', the local institutions representing the collective of customary landowners. However, as has been shown for other contexts, it is too often naively assumed that in situations where land and resources are collectively owned, collective interests will naturally prevail over individual interests (Scudder *et al*. 2019, Singer 2008). This is especially true with respect to the management of the money resulting from the commodification of such land and resources. Moreover, the negotiation process as a whole is hampered by the highly uneven knowledge, power and financial means of the company, licensee and landowners (see also Farran 2016).

In the Malaitan socio-political context, both 'Big Men' and Chiefs are central political figures, sometimes in combination. Chiefs derive status from lineage, albeit historically with several in-built checks and balances. In contrast, 'Big Men' generate and maintain status and loyalty through distribution of wealth (Farran 2016, Kabutaulaka 2000, Turnbull 2002). Licensees often take on the role of 'Big Men', and land committees tend to be composed of those loyal to the licensee. This is reflected in the commonly expressed view that royalties are only received by those close to the licensee.

An additional way in which the industry is assumed to contribute to rural development is through annual provincial logging fees, which companies are supposed to pay on a yearly basis. However, most companies have a poor track record in paying their dues and the Provincial Government of Malaita is unable to hold them accountable. In November 2019, the 21 logging companies operating on Malaita had an outstanding debt of SBD 4.6 million (USD 572,435) worth of provincial logging fees (Saeni 2019), equalling roughly 12% of the provincial budget for that year (Lofana 2020). By May 2020, only six of these companies had settled their bills (Iroga 2020).

As a result, the assumption that logging revenues will trickle down to local communities through employment or revenues doesn't hold. The only available quantification of the contribution of logging to household income estimated that logging provided a temporary (12–18 months) increase of 15% in average household income in the early 1990s (Fitzgerald and Schoeffel 1991 in Frazer 1997: 9). In a more recent study, only 0.1% of over 3,400 surveyed Solomon Islanders reported logging as an important source of cash income (ANU-USP 2013). The claim by the IMF (2020: 14) that 'household consumption is linked to cycles in logging', suggests a far larger contribution of logging to the rural economy than the evidence justifies.

Finally, the suggestion that logging contributes to local infrastructure development (Pauku 2009: 26) is equally flawed. The Solomon Islands Government is largely absent in rural areas and in these 'spaces of statelessness' (Allen

2017 in World Bank 2017: 25) landowners indeed view logging operations as a rare opportunity to obtain public services that government fails to provide, notably roads, clinics and schools.

However, although logging companies may have in some Central African contexts displayed para-statal behaviour (Singer 2008) and sometimes significantly contributed to road infrastructure (Lescuyer *et al*. 2012), in Solomon Islands this has never been the case. Moreover, similar to Cameroon and Zambia (Asanzi *et al*. 2014, Lescuyer *et al*. 2012, Defo 2020), logging companies' delivery of other development benefits is poor. At best, they have engaged in 'symbolically laden forms of gift giving' (Hardin 2011: 17), such as sponsoring ancestor worshipping rituals, funerals, soccer teams, petrol allowances for a select elite or ceremonial food sharing.

Logging undermines subsistence livelihoods

Logging operations, unregulated as they are, undermine the subsistence economy. Even though cash dependency has much increased in recent decades, for the overwhelming majority of Malaitans, and Solomon Islanders more generally, fishing and swidden cultivation still generate the bulk of daily food (Schwarz *et al*. 2013, van der Ploeg *et al*. 2016). Moreover, for those with paid jobs, in times of crisis when employment is uncertain, subsistence livelihoods continue to be the main safety net (Posso and Clarke 2014), the COVID pandemic being a vivid illustration (Eriksson *et al*. 2020).

However, such subsistence impacts are rarely quantified. The only study that has ever calculated the monetary impacts of logging on Solomon Islands' subsistence economy, found that a logging operation in Choiseul resulted in a net annual loss of SBD 7,545 per household (this was after royalty payments had been deducted). This was the result of damage to gardens, trees that were used for construction and canoe building, and numerous other forest products (Cassells 1993).

Similar impacts from logging on subsistence livelihoods have been documented for other parts of the world (e.g. Counsell *et al*. 2007, Headland and Headland 1997, Mousseau and Lau 2015, Persoon 2008, Watson 1996). While the effects on non-timber forest products are particularly well-known (Ndoye and Tieguhong 2004), this study has specifically highlighted the perceived relationship between logging and fisheries that has also been documented in ecological studies.

There is increasing scientific evidence of the negative impact of logging on freshwater and marine ecosystems. In particular, the creation of log ponds and unpaved roads result in high increases in, sometimes toxic, sediment load on coral reefs and in rivers (e.g. Bégin *et al*. 2014, Boboria *et al*. 2021, Hamilton *et al*. 2017, Wenger *et al*. 2018, 2020). Fish and shellfish being the main sources of animal protein in Solomon Islands' diets (Albert *et al*. 2020), these impacts increase the risk of malnutrition (SIG 2017, Minter *et al*. 2018).

These concerns are compounded by the negative impacts of logging on both open freshwater sources and piped water systems (see also Global Witness 2018). With nearly 90% of rural Malaitans depending on either of these two for drinking water (MHMS 2015), this forms a public health hazard (but see Albert *et al*. 2021 for similar impacts on urban populations).

For all these forms of damage to subsistence livelihoods, landowners are often chronically immersed in complaint and compensation procedures, which mostly remain unanswered. The lack of government presence means that logging companies can *de facto* operate unchecked. Many people feel structurally unsupported by government authorities in logging disputes and by the police in particular, who are viewed as only protecting logging companies and their interests (Allen *et al*. 2013: 54–5). Some authors have suggested that the occasional acts of violence against logging personnel or their equipment[11] must be seen in the light of this failing justice system (e.g. Baines 2015: 14).

Logging causes social disruption

Much of the social discord documented in this paper stems from the fact that logging is not based on broad acceptance, but on decisions of a small, male elite. While it is also mainly this select group who benefit from logging, this comes at the expense of the rights and livelihoods of others.

Women in particular see the fewest benefits and carry most of the burdens. The male dominated character of the logging industry itself, and the way that land rights and decision-making processes regarding land and resources are locally organized, work together towards the systematic exclusion of women from both the management and potential benefits of logging. Similar trends have been described for the situation surrounding extractive industries in Papua New Guinea (Macintyre 2003, 2007).

Especially worrying is the sexual exploitation of local girls and women by logging personnel. While this problem as well as the associated health risks have long been noted (Allen *et al*. 2013, Buchanan 2017, Herbert 2007, IOM 2019, John 2017, Raomae 2010, Runa 2018, Sanga 2017, Toito'ona 2017, World Bank 2017), it remains unaddressed.

Over two decades ago, Roughan (1997: 160) wrote about Solomon Islands: 'Commercial logging, like no other issue, has split the young nation. [. . .] no other single activity has caused so much hurt and distrust and produced a growing gap of suspicion among families and clan lines and between provinces and the central government'. Roughan's observation is repeated in a qualitative study on the sources of conflict and grievances in 86 rural communities in five of Solomon Islands' nine provinces, including Malaita, by Allen *et al*. (2013: xi, 21–23), who conclude that: 'Those areas that were in the midst of, or had recently experienced, logging activities

[11] See for example: https://www.solomonstarnews.com/index.php/item/10775-dispute-deepens, https://www.solomonstarnews.com/index.php/news/national/item/21153-logging-machines-burntdown-in-dispute, https://www.rnz.co.nz/international/pacific-news/336731/more-logging-machines-burnt-in-solomons

were generally the most fractious and dysfunctional, with substantial social order problems and crime.'

Thus, the most alarming aspect of the social impacts of logging that this paper documents is that they are nothing new. They arose as soon as commercial logging became the mainstay of the Solomon Islands Government's development strategy in the early 1980s, and have since persisted and deepened. Successive administrations have welcomed the industry and become increasingly entangled with it (Porter and Allen 2015), at a very high social cost. The only government that was critical of logging (the National Coalition Partnership 1993–1994) was brought down mainly because of its attempts to reform the forestry sector (Frazer 1997).

History has shown how serious the consequences of elite capture of logging benefits may be. It is increasingly acknowledged that the destabilizing effect of the close ties between the logging industry and the political elite is among the root causes of the 'Tension'. Given that these ties still exist and have arguably further intensified (Bennett 2002, Allen and Porter 2016, Farran 2016), the safeguarding of peace and stability remains a serious concern.

CONCLUSION

The development narrative that has justified Solomon Islands' reliance on foreign-led export logging for four decades, fails to take into account the local level social impacts of the logging industry. This macro-economic perspective structurally overlooks and undervalues the subsistence economy and its associated social structures, which together form the foundation of sustenance and well-being for the large majority of Solomon Islanders.

Logging benefits do not trickle down to forest dependent communities due to logging companies' poor compliance with financial obligations, the lack of transparent benefit sharing agreements, and elite capture at all levels of the Solomon Islands' political economy. Moreover, the focus on roundwood production and export, rather than timber milling and processing, makes the industry relatively labour extensive.

Moreover, in the absence of state regulation, logging companies and their intermediaries operate virtually without checks and balances which in turn results in very poor logging practices, both environmentally and socially. Haphazard log pond and road construction at the expense of mangrove forests, coral reefs, swidden fields and water systems, combined with overharvesting and oil spills, severely damage the local subsistence base. Simultaneously, the lack of political oversight facilitates sexual exploitation of women and girls and excessive alcohol consumption.

What stands out from the impacts of logging on both subsistence activities and social relations, is that women are disproportionately affected. This pattern is both caused and perpetuated by women's structural exclusion from decision-making relating to logging operations. Thus, in a context of already alarming gender disparities and gender-based violence, logging reinforces gender inequity.

In order to move forward, the realities of people in the rural areas will have to become a central factor in forest policy and development planning. This means an explicit valuation of the subsistence economy, which rather than continuously emphasizing the importance of logging as a source of national revenue, emphasizes the importance of gardening and fisheries for Solomon Islanders' sustenance and wellbeing.

Clearly, this will require fundamental reorganization of the logging sector. An important potential avenue for change is offered by two recent related developments. First, the ongoing review of the outdated FRTUA might result in more equitable and transparent logging agreements, legal prescriptions on citizen representation and participation in decision-making, as well as effective grievance mechanisms. In order for this to happen, however, it is paramount that the forest industry itself is granted a much more modest role in the review process than has been the case in earlier failed attempts to revise the act.

Second, the endorsement of the National Forest Policy 2020 is a key step in acknowledging, by the Ministry of Forestry and Research itself, the systemic problems that the forestry sector faces in terms of sustainability, governance and social outcomes. Of the ten principles that guide the policy, the most promising include effective monitoring and law enforcement, multi-stakeholder participation, multi-sectoral engagement, and respect for culture and human rights.

Only when there is full commitment throughout the forestry sector, to address the negative impacts of logging on subsistence livelihoods and social relations, and on women in particular, will these principles stand a chance of resulting in structural improvements in the everyday lives of women and men in Solomon Islands.

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REFERENCES

AAA (AMERICAN ANTHROPOLOGICAL ASSOCIATION). 2012. Statement on Ethics. Principles of professional responsibility. AAA Statement on Ethics – Learn and Teach (americananthro.org).

ADB (ASIAN DEVELOPMENT BANK). 1998. Natural resource development and the environment I: Forestry. In: Solomon Islands 1997 Economic Report. Pacific Studies Series. Pp. 53–78. ADB, Manila, The Philippines.

ALBERT, S., GRINHAM, B., GIBBES, I., TIBBETTS, J., and UDY, J. 2014. Indicators of coral reef ecosystem recovery following reduction in logging and implementation of community-based management schemes in the Solomon Islands. *Pacific Conservation Biology* **20**(1): 75–85.

ALBERT, J., BOGARD, J., SIOTA, F., MCCARTER, J., DIATALAU, S., MAELAUA, J., BREWER, T., and ANDREW, N. 2020. Malnutrition in rural Solomon Islands: An analysis of the problem and its drivers. *Maternal and child nutrition* **16**(2): 1–12.

ALBERT, S., DEERING, N., TONGI, S., NANDY, A., KISI, A., SIRIKOLO, M., MAEHAKA, M., HUTLEY, N. KIES-RYAN, S., and GRINHAM, A. 2021. Water quality challenges associated with industrial logging of a karst landscape: Guadalcanal, Solomon Islands. *Marine Pollution Bulletin* **169**: 112506.

ALLEA (ALL EUROPEAN ACADEMICS). 2017. European Code of Conduct for Research. ALLEA, Berlin, Germany.

ALLEN, M.G. 2008. The political economy of logging in Solomon Islands. In: DUNCAN, R. (ed.) *The political economy of economic reform in the Pacific*. ADB Pacific Study Series. pp. 277–301. ADB, Manila, The Philippines.

ALLEN, M.G., DINNEN, S., EVANS, D., and MONSON R. 2013. *Justice delivered locally. Systems, challenges and innovations in Solomon Islands.* World Bank, Washington DC, USA.

ALLEN, M.G., and PORTER D.J. 2016. Managing the transition from logging to mining in post-conflict Solomon Islands. *The Extractive Industries and Society* **3**: 350–358.

ARNOLD, M., POWELL, B., SHANLEY, P., and SUNDERLAND, T.C.H. 2011. Forests, biodiversity and food security. *International Forestry Review* **13**(3): 259–264.

ASANZI, P., PUTZEL, L., GUMBO, D., and MUPETA, M. 2014. Rural livelihoods and the Chinese timber trade in Zambia's Western Province. *International Forestry Review* **16**(4): 447–458.

BAINES, G. 2015. 'Solomon Islands is unprepared to manage a minerals-based economy.' *State Society and Governance in Melanesia* Discussion Paper **2015**(6): 1–19.

BÉGIN, C., BROOKS, G., LARSON, R.A., DRAGIĆEVIĆ, S., SCHARRÓN, C.E.R., and CÔTÉ, I.M. 2014. Increased sediment loads over coral reefs in Saint Lucia in relation to land use change in contributing watersheds. *Ocean and Coastal Management* **95**: 35–45.

BENNETT, J. 2002. Roots of conflict in Solomon Islands. Though much is taken much abides: legacies of tradition and colonialism. *State Society and Governance in Melanesia* Discussion Paper **5**: 1–16.

BOBORIA, D., MAATA, M., and MANI, F.S. 2021. Metal pollution in sediments and bivalves in Marovo Lagoon, Solomon Islands. *Marine Pollution Bulletin* **164**: 112026.

BUCHANAN, A. 2017. Malaysian charged. First human trafficking case goes before court. *Solomon Star* August 30 2017. Honiara, Solomon Islands.

BURT, B. 1994. *Tradition and Christianity: the colonial transformation of a Solomon Islands society.* Harwood Academic Publishers, Chur, Switzerland.

CASSELLS, R.M. 1993. Tropical Rainforest: Subsistence Values Compared with Logging Royalties. In: WALSH, A.C. (ed), *Development That Works! Lessons from Asia-Pacific.* Massey University, Palmerston North, New Zealand.

CBSI (CENTRAL BANK OF SOLOMON ISLANDS). 2016. *Annual Report of 2015*. CBSI, Honiara, Solomon Islands.

CBSI (CENTRAL BANK OF SOLOMON ISLANDS). 2017. *Annual Report of 2016*. CBSI, Honiara, Solomon Islands.

CBSI (CENTRAL BANK OF SOLOMON ISLANDS). 2018. *Annual Report of 2017*. CBSI, Honiara, Solomon Islands.

CBSI (CENTRAL BANK OF SOLOMON ISLANDS). 2019. *Annual Report of 2018*. CBSI, Honiara, Solomon Islands.

CBSI (CENTRAL BANK OF SOLOMON ISLANDS). 2020. *Annual Report of 2019*. CBSI, Honiara, Solomon Islands.

CERUTTI, P.O., LESCUYER, G., TSANGA, R., KASSA, S.N., MAPANGOU, P.R., MENDOULA, E.E., MISSAMBA-LOLA, A.P., NASI, R., ECKEBIL, P.P.T., and YEMBE, R.Y. 2014. Social impacts of the Forest Stewardship Council certification: An assessment in the Congo basin. CIFOR Occasional Paper 103. CIFOR, Bogor, Indonesia.

CHARNLEY, S. 2006. Industrial plantation forestry: Do local communities benefit? *Journal of Sustainable Forestry* **21**(4): 35–57.

CHOMITZ, K.M., BUYS, P., DE LUCA, G., THOMAS, T.S., and WERTZ-KANOUNNIKOFF, S. 2007. *At loggerheads? Agricultural expansion, poverty reduction, and environment in the tropical forests.* World Bank, Washington DC, USA.

CONNEL, J. 1978. *Taim bilong mani. The evolution of agriculture in a Solomon Island Society.* The Australian National University. Development Studies Centre Monograph no.12. ANU, Canberra, Australia.

COUNSELL, S., LONG, C., and WILSON, S. 2007. *Concessions to poverty. The environmental, social and economic impacts of industrial logging concessions in Africa's rainforests.* The Rainforest Foundation UK and Forests Monitor, London, UK.

DAUVERGNE, P. 1998. Corporate power in the forests of the Solomon Islands. *Pacific Affairs*, 524–546.

DEFO, L. 2020. Six years of industrial logging in Ngoyla (East-Cameroon): what have been the outcomes for local populations? *International Forestry Review* **22**(S2).

DYER, M. 2016. Eating money: Narratives of equality on customary land in the context of natural resource extraction in the Solomon Islands. *The Australian Journal of Anthropology* doi:10.1111/taja.12213

ERIKSSON, H., RIDE, A., BOSO, D., SUKULU, M., BATALOFO, M., SIOTA, F., and GOMESE, C. 2020. Changes and adaptations in village food systems in Solomon Islands: A rapid appraisal during the early stages of the COVID-19 pandemic. Program Report 2020-22. WorldFish, Penang, Malaysia.

FAO (FOOD AND AGRICULTURE ORGANIZATION). 2014. State of the world's forests. Enhancing the socio-economic benefits from forests. FAO, Rome, Italy.

FAO (FOOD AND AGRICULTURE ORGANIZATION). 2017. Sustainable forestry for food security and nutrition. A report by the high-level panel of experts on food security and nutrition of the committee on world food security. FAO, Rome, Italy.

FAO (FOOD AND AGRICULTURE ORGANIZATION). 2020. State of the World's Forests. FAO and UNEP. 2020. The State of the World's Forests 2020. Forests, biodiversity and people. FAO, Rome, Italy.

FARRAN, S. 2016. Timber extraction in Solomon Islands: too much, too fast, too little, too late. In: GILBERTHORPE, E., and HILSON, G. (eds.). *Natural resource extraction and indigenous livelihoods: Development challenges in an era of globalization.* Pp. 179–200. Routledge, London and New York, USA.

FIRMIN, M.W. 2012. Unstructured Interview. In: GIVEN, L. (ed.) The SAGE Encyclopedia of Qualitative Research Methods. Sage Publications Inc., Thousand Oaks, USA.

FRAZER, I. 1997. 'The struggle for control of Solomon Island forests.' *The Contemporary Pacific* **9**(1): 39–72.

GLOBAL WITNESS. 2018. Paradise Lost. How China can help Solomon Islands to protect its forests. Global Witness, London, UK.

HAMILTON, R. J, ALMANY, G. R, BROWN, C. B, PITA J., PETERSON, N.A., and CHOAT, J.H. 2017. Logging degrades nursery habitat for an iconic coral reef fish. *Biological Conservation* **210**: 273–280.

HARDIN, R. 2011. Concessionary politics: property, patronage, and political rivalry in central African forest management. *Current Anthropology* **52**(S3): 113–125.

HEADLAND, T.N., and HEADLAND, J.D. 1997. Limitation of human rights, land exclusion, and tribal extinction, The Agta Negritos of the Philippines. *Human Organization* **56**: 79–90.

HERBERT, T. 2007. *Commercial sexual exploitation of children in the Solomon Islands. A report focusing on the presence of the logging industry in a remote island*. CCC Church of Melanesia, Honiara, Solomon Islands.

HOBBIS, S. 2019. A road to development? Rural perspectives on infrastructure maintenance in Solomon Islands *Development in Practice* **29(**6): 748–759.

HUNT, L. 2019. A new election brings little hope for Solomon Islands' vanishing forests. *Mongabay Series*: Forest Trackers.

IOM (INTERNATIONAL ORGANIZATION FOR MIGRATION). 2019. *Community health and mobility in the Pacific. Solomon Islands Case Study*. IOM, Honiara, Solomon Islands.

IMF (INTERNATIONAL MONETARY FUND). 2020. Solomon Islands. IMF Country Report No. 20/49. IMF, Washington D.C., USA.

IROGA, R. 2020. MARA Government warn logging companies comply or move out. *Solomon Business Magazine* June 5 2020 https://sbm.sb/2020/06/05/mara-government-warn-logging-companies-comply-or-move-out/

ITTO (INTERNATIONAL TROPICAL TIMBER ORGANIZATION). 2019. Biennial review and assessment of the world timber situation 2017–2018. ITTO, Yokohama, Japan.

JOHN, A. 2017. Children with foreign fathers an issue: Ghiro. *Solomon Star* February 17 2017. Honiara, Solomon Islands.

KABUTAULAKA, T. 2000. Rumble in the Jungle: land, culture and (un)sustainable logging in Solomon Islands. In: HOOPER, A. (ed.) *Culture and sustainable development in the Pacific.* Pp. 88–97. Asia Pacific Press, Canberra, Australia.

KARJALAINEN, E., SARJALA, T., and RAITIO, H. 2009. Promoting human health through forests. Overview and major challenges. *Environmental Health and Preventive Medicine* **15**: 1–8.

KATOVAI, E., EDWARDS, W., and LAURANCE, W.F. 2015. Dynamics of logging in Solomon Islands: The need for restoration and conservation alternatives. *Tropical Conservation Science* **8**(3): 718–731.

KATOVAI, E., KATOVAI, D.D., and LAURANCE, W.F. 2021. Potential restoration approaches for heavily logged tropical forests in Solomon Islands. In: ROBERTS, J.L., NATH, S., PAUL, S., and MADHOO, Y.N. (eds.) Shaping the future of small islands; Roadmap for sustainable development. Pp. 219–232. Palgrave Macmillan, Singapore.

KIDDLE, L., D. STRONGE and PENNAY, M. 2017. Giant African Snails: devastating gardens and livelihoods in Solomon Islands. *Devpolicy Blog*. The Development Policy Centre, Canberra, Australia.

KIRRAU, F. 2016. 2015/2016 Logging operations Malaita Province. Ministry of Forestry and Research Malaita Province. MOFR, Auki, Solomon Islands.

KWA'IOLOA, M., and BURT, B. 2001. *Our forest of Kwara'ae. Our life in Solomon Islands and the things growing in our home.* The British Museum Press, London, UK.

LALSU (LANDOWNERS' ADVOCACY AND LEGAL SUPPORT UNIT). (No date). The timber rights acquisition process for landowners. Public Solicitor's Office, Honiara, Solomon Islands.

LALSU (LANDOWNERS' ADVOCACY AND LEGAL SUPPORT UNIT). 2015. *Environmental Law in Solomon Islands.* Public Solicitor's Office, Honiara, Solomon Islands.

LAUNGI, A.J. 2018a. Less revenue from logs. *Solomon Star* March 16 2018. Honiara, Solomon Islands.

LAUNGI, A.J. 2018b. Study shows millions lost in logging.' *Solomon Star* March 20 2018. Honiara, Solomon Islands.

LESCUYER, G., MVONDO, S.A., ESSOUNGOU, J.N., TOISON, V., TRÉBUCHON, J.F., and FAUVET, N. 2012. Logging concessions and local livelihoods in Cameroon: from indifference to alliance? *Ecology and Society* **17**(1).

LI, Y., MEI, B., and LINHARES-JUVENAL, T. 2019. The economic contribution of the world's forest sector. *Forest Policy and Economics* **100**: 236–253.

LIGHTFOOT, C., and RYAN, T. 2001. Is poverty an issue in the Pacific? Unpublished paper delivered at the Asia and Pacific Forum on Poverty: Reforming Policies and Institutions for Poverty Reduction, held at ADB, Manila, The Philippines.

LOFANA, S. 2020. Malaita passes 33M budget. *Solomon Star* March 23 2020. Auki, Solomon Islands.

MACINTYRE, M. 2007. Informed consent and mining projects: a view from Papua New Guinea. *Pacific Affairs* **80**(1): 49–65.

MACINTYRE, M. 2003. Petztorme women: responding to change in Lihir, Papua New Guinea. *Oceania* **74**(1/2): 120–134.

MINTER, T., ORIRANA, G., BOSO, D., and VAN DER PLOEG, J. 2018. From happy hour to hungry hour: Logging, fisheries and food security in Malaita, Solomon Islands. WorldFish, Penang, Malaysia.

MHMS (MINISTRY OF HEALTH AND MEDICAL SERVICES). 2015. Solomon Islands Rural Water, Sanitation, and Hygiene (WASH). Malaita Province Snapshot. MHMS Environmental Health Division, Honiara, Solomon Islands.

MOFR (MINISTRY OF FORESTRY AND RESEARCH). 1984. Forest Resources and Timber Utilisation Act 1969. Ministry of Forestry and Research, Honiara, Solomon Islands.

MOFR (MINISTRY OF FORESTRY AND RESEARCH). 2017. Connecting people with nature. A decade of learning. Presentation by Permanent Secretary of the Ministry of Forestry and Research at the National Resource Management Symposium October 2–6 2017. Honiara, Solomon Islands.

MOFR (MINISTRY OF FORESTRY AND RESEARCH). 2020. National Forest Policy. MOFR, Honiara, Solomon Islands.

MOORE, C. 2004. Happy Isles in Crisis: The historical causes for a failing state in the Solomon Islands, 1998–2004. Asia Pacific Press, Canberra, Australia.

MOORE, C. 2017. *Making Mala. Malaita in Solomon Islands 1871s-1930s.* ANU Press, Acton, Australia.

MORGAN, D.L., and GUEVARA, H. 2012. Interview Guide. In: GIVEN, L. (ed.) The SAGE Encyclopedia of Qualitative Research Methods. Sage Publications Inc., Thousand Oaks, USA.

MORSE, J.M., BARRETT, M., MAYAN, M., OLSON, K., and SPIERS, J. 2002. Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods* **1**(2):13.

MOUSSEAU, F., and LAU, P 2015 The great timber heist. The logging industry in Papua New Guinea. The Oakland Institute, Oakland, New Zealand.

NDOYE, O., and TIEGUHONG, J.C. 2004. Forest resources and rural livelihoods: the conflict between timber and non-timber forest products in the Congo Basin. *Scandinavian Journal of Forest Research* **19**(S4): 36–44.

NSO (National Statistics Office). 2020. Provisional Count. 2019 National Population and Housing Census. NSO Census Office, Honiara, Solomon Islands.

O'REILLY, K. 2012a. Inductive and Deductive. In: O'REILLY, K. Key Concepts in Ethnography. Pp. 104–109. Sage Publications Ltd., London, UK.

O'REILLY, K. 2012b. Coding. In: O'REILLY, K. Key Concepts in Ethnography. Pp. 34–38. Sage Publications Ltd., London, UK.

PAUKU, R.L. 2009 Solomon Islands forestry outlook study. Asia-Pacific Forestry Outlook Study II. FAO, Bangkok, Thailand.

PERSOON, G.A. 2000. The Kubu of Central Sumatra, Indonesia. In: SPONSEL, L.E. (ed.) *Endangered peoples of Southeast and East Asia. Struggles to survive and thrive.* Pp. 157–172. Greenwood Press, London, UK.

PERSOON, G.A. 2008. Hidden suffering on the island of Siberut, West Sumatra. In: COLFER, C. (ed.) *Human health and forests. A global overview of issues, practice and policy*. Pp. 333–346. People and Plants International Conservation Series. Earthscan, London, UK.

PERSOON, G.A., and MINTER, T. 2011. Code of conduct for working with indigenous and local communities. Tropenbos International, Wageningen, The Netherlands.

POLLARD, A. 1997. Keni ni ha'ananauha. Women as givers of wisdom. Rethinking the changing roles of rural women in Waisisi community, Solomon Islands. MA thesis. Victoria University of Technology, Melbourne, Australia.

PORTER, D., and ALLEN, M. 2015. The political economy of the transition from logging to mining in Solomon Islands. Australia National University. Discussion Paper. *State Society and Governance in Melanesia* **12**: 1–16.

POSSO, A., and CLARKE, M. 2014. Mobility and economic resilience in Melanesia. In: S. FEENY *Household vulnerability and resilience to economic shocks: Findings from Melanesia.* Pp. 67–81. Ashgate Publishing, Surrey, UK.

RAOMAE, R. 2010. Overview of logging in the Solomon Islands. The state of our forest and the impact of logging. Ministry of Forests and Research, Honiara, Solomon Islands.

ROSS, H.M. 1973. *Baegu. Social and Ecological Organization in Malaita, Solomon Islands.* Illinois Studies in Anthropology No. 8. University of Illinois Press, Urbana, Chicago, London, UK.

ROUGHAN, J. 1997. Solomon Island nongovernment organizations: major environmental actors. *The Contemporary Pacific* 157–166.

RUNA, L. 2018. 'Forced marriages' still common here. Human trafficking continues in Western Province. *Solomon Star* February 5 2018. Honiara, Solomon Islands.

SAENI, B.W. 2017a. The 'Cubic Women' of Waisisi. *Malaita Star July-September 2017.* p. 22. Star Print and Publishing Limited, Honiara, Solomon Islands.

SAENI, B.W. 2017b. More snails now in West Kwara'ae. *Solomon Star* March 25 2017. Honiara, Solomon Islands.

SAENI, B.W. 2019. Mala gets tough on loggers. *Solomon Star* November 11 2019. Honiara, Solomon Islands.

SANGA, L. 2017. Sexual exploitation of women common here. *Solomon Star* May 7 2017. Honiara, Solomon Islands.

SCHWARZ, A-M., ANDREW, N., GOVAN, H., HAROHAU, D., and OETA, J. 2013. Solomon Islands Malaita Hub Scoping Report. CGIAR Research Program on Aquatic Agricultural Systems. Project Report: AAS-2013-18. WorldFish, Penang, Malaysia.

SCUDDER, M.G., BAYNES, J., and HERBOHN, J. 2019. Timber royalty reform to improve the livelihoods of forest resource owners in Papua New Guinea. *Forest policy and economics* **100**: 113–119.

SIG (SOLOMON ISLANDS GOVERNMENT). 1998. The Environment Act 1998. Solomon Islands Government, Honiara, Solomon Islands.

SIG (SOLOMON ISLANDS GOVERNMENT). 2002. The revised Solomon Islands Code of Logging Practice. Ministry of Forests, Environment and Conservation, Honiara, Solomon Islands.

SIG (SOLOMON ISLANDS GOVERNMENT). 2016. National Development Strategy 2016–2035. Improving the social and economic livelihoods of all Solomon Islanders. Ministry of Development Planning and Aid Coordination, Honiara, Solomon Islands.

SIG (SOLOMON ISLANDS GOVERNMENT). 2017. Solomon Islands 2015 Demographic and Health Survey. Final Report. Solomon Islands National Statistics Office/ Solomon Islands Ministry of Health and Medical Services/ Pacific Community, Honiara, Solomon Islands.

SIL (SUMMER INSTITUTE OF LINGUISTICS). 2009. *Ethnologue. Languages of the World.* Sixteenth Edition. SIL International, Texas, USA.

SINCLAIR KNIGHT MERZ. 2012. Solomon Islands National Forest Resources Assessment: 2011 Update. SKM, Melbourne, Australia.

SINGER, B. 2008. Cameroonian forest-related policies: A multisectoral overview of public policies in Cameroon's forests since 1960. PhD. CIRAD, Montpellier, France.

SLEE, B. 2006. The socio-economic evaluation of the impact of forestry on rural development: a regional level analysis. *Forest Policy and Economics* **8**(5): 542–554.

SPREP (Secretariat of the Pacific Regional Environmental Programme). 2019. *Solomon Islands State of Environment Report 2019.* SPREP, Apia, Samoa.

STRONGE, D. 2016. 'Invasive alien species: a threat to sustainable livelihoods in the Pacific? An assessment of the effects of *Wasmannia auropunctata* (little fire ant) and *Achatina fulica* (giant African snail) on rural livelihoods in the Solomon Islands. PhD thesis. Massey University, New Zealand.

TOITO'ONA, R. 2017 Human trafficking on Rennell. *Star National* Issue **5**: 12. Honiara, Solomon Islands.

TOKI, B., LEGER, L., RICHARDS, S., HIPKIN, S., LORIMER, J., and COULTON, R. 2017. Solomon Islands Ecosystem and Socio-economic Resilience Analysis and Mapping (ESRAM). Volume 1: Introduction and National Assessment. SPREP, Apia, Samoa.

TURNBULL, J. 2002. Solomon Islands: blending traditional power and modern structures in the state. *Public Administration and Development: The International Journal of Management Research and Practice* **22**(2): 191–201.

VANCLAY, F. 2003. International principles for social impact assessment. Impact assessment and project appraisal, **21**(1): 5–12.

VANCLAY, F., ESTEVES, A.M., AUCAMP, I., and FRANKS, D. 2015. Social Impact Assessment: Guidance for assessing and managing the social impacts of projects. International Association for Impact Assessment. University of Groningen, Groningen, The Netherlands.

VAN DER PLOEG, J., JUPITER, S., HUGHES, A., ERIKSSON, H., BOSO, D., and GOVAN, H. 2020. Coral reef conservation in Solomon Islands: Overcoming the policy implementation gap. Program Report 2020-39. WorldFish, Penang, Malaysia.

VAN DER PLOEG, J., ALBERT, J., APGAR, M., BENNETT, G., BOSO, D., COHEN, P., DAOKALIA, C., FAIAU, J., HAROHAU, D., IRAMO, E., ORIRANA, G., RICE, M., SAENI, E., SIOTA, F., SUKULU, M., SULU, R., SURUMA, B., TEIOLI, H., TIKAI, P., and SCHWARZ, A.M. 2016. *Learning from the Lagoon. Research in development in Solomon Islands.* CGIAR Research Program on Aquatic Agricultural Systems, Program Report. WorldFish, Penang, Malaysia.

WATSON, F. 1996. A view from the forest floor: the impact of logging on indigenous peoples in Brazil. *Botanical Journal of the Linnean Society* **122**(1): 75–82.

WENGER, A.S., HARRIS, D., WEBER, S., VAGHI, F., NAND, Y., NAISILISILI, HUGHES, W.A., DELEVAUX, J.M.S., KLEIN, C.J., WATSON, J., MUMBY P.J., and JUPITER, S.D. 2020. Best-practice forestry management delivers diminishing returns for coral reefs with increased land-clearing. *Journal of Applied Ecology* **57**(12): 2381–2392.

WENGER, A.S., ATKINSON, S., SANTINI, T., FALINSKI, K., HUTLEY, N., ALBERT, S., HORNING, N., WATSON, J.E.M., MUMBY, P.J., JUPITER, S.D. 2018. Predicting the impact of logging activities on soil erosion and water quality in steep, forested tropical islands. *Environmental Research Letters* **13**(4).

WORLD BANK. 2016. World Bank Group Forest Action Plan FY16-20. World Bank, Washington, USA.

WORLD BANK 2017. Solomon Islands systematic country diagnostic priorities for supporting poverty reduction and promoting shared prosperity. World Bank, Washington, USA.

WUNDER, S., ANGELSEN, A., and BELCHER, B. 2014. Forests, livelihoods and conservation. Broadening the empirical base. *World Development* **64**: S1–S11.

YARI, M. 2003. Beyond "subsistence affluence": poverty in Pacific Island countries. *Bulletin on Asia-Pacific Perspectives* 2003/04: 4153 United Nations Economic and Social Commission for Asia and the Pacific, New York, USA.