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Multivocal responses to conservation in Maluku province, Indonesia: Biocultural diversity, protest and management in a zone of ecological transition

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The Moluccan islands of eastern Indonesia (Maluku) were amongst the last frontiers to be opened-up for large-scale resource extraction and economic development in modern times. The interventions of organized conservation science and local conservation activity are also recent. Yet the area has a complex economic history and historical ecology linked to the spice trade, which itself prompted early scholarly interest in its natural history. Conservation practice since 1980 is shown to be deeply embedded in local political events and cultural contexts, exhibiting a diversity of institutional forms and a 'cacophony' of community voices. We conclude that conservation research and interventions need to pay more attention to historical ecologies, biocultural linkages and distinctively local patterns of conservation activity.

Keywords: scientific attention, conservation discourse, biocultural diversity, historical ecology, Moluccas (Maluku) Indonesia

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Introduction

International conservation attention, local responses to ecological degradation and the application of global environmentalist rhetoric came relatively late to the Moluccan islands (Maluku). This was amongst the last frontiers in Indonesia to be opened-up for economic development in modern times. For much of the twentieth century this process was slow, but there has been dramatic expansion since around 1980. Driven by in-migration, logging, mining, plantation establishment and commercial fisheries, there have been major environmental consequences with social and political repercussions involving local communities, the wider public and urban elites. In part, local responses have been embedded in an appeal to tradition and the mobilization of customary institutions.

If we are to understand the shape and implications of new social and scientific interventions, we need to know what is bioculturally distinctive about the area. In examining contemporary conservation discourse, we find a variety of voices, many innocent of the long-term historical ecology which underpins them. Our purpose is to overview this background, and thereafter examine the emerging pattern of contemporary conservation discourse and action. We describe a variety of institutional forms and a 'cacophony' of community voices. We conclude that conservation research and

interventions need to pay more attention to historical ecologies, biocultural connections and distinctively local configurations of conservation activity.

Our analysis focuses on biocultural diversity and conservation activity within the boundaries of the province of Maluku as it has existed since 1999. In this year the province of Maluku Utara was created following civil disturbances throughout the Moluccan islands. However, to understand the broader historical context, we refer to the 'Moluccan islands' more generally as defined for the purposes of Dutch colonial administration and thereafter the administration of the independent state of Indonesia. We use a range of secondary sources to overview this background, showing how Maluku is a bioculturally complex zone. This demonstration also draws on Ellen's research over a period of 50 years on the relationship between Moluccan peoples and their environment, including extensive long-term ethnographic fieldwork. In light of this, we examine the emerging pattern of contemporary conservation discourse and activity evident from published (including online) literature, a review of newspaper and other press reports and directed local enquiries and interviews using networks of principal actors, activists and academics. This work required the extensive local experience of Soselisa, and draws on her own fieldwork and contacts as a native Ambonese. The detailed material is set out in Tables S1 and S2, and in Appendices S1, S2 and S3 of the Supplementary Information.

Scientific attention, ecological change and economic history

Although modern economic development and scientific conservation came late to the Moluccas, the recency of active research and concern (see e.g. Monk *et al.*, 1997: Appendix 2, 881–6) contrasts with the role of 'the spice islands' as a focus of global economic and political interest during the early modern period. Even before the arrival of Europeans, the Moluccas had been a hub, connecting the Asian world with Melanesia, and a production centre for two products already of high Eurasian significance: nutmeg and clove (Ellen, 1979; 2003). Certain kinds of nutmegs had long been wild-harvested, but a shift in the scale of production came with the development of the Banda archipelago as a virtually exclusive area for the trade in round *Myristica fragans*. A similar pattern developed in the north Moluccas focused on the small islands of Ternate and Tidore and the cultivation of clove, *Syzygium aromaticum*. This commercial attention led to humanly-induced environmental change. By the early sixteenth century, there were already landscapes much transformed through the systematic planting of clove and nutmeg, specialized and simplified monocultural ecologies underpinned by local trade in products from the *Metroxylon sagu* palm.

Arrival of European adventurers and traders as players in the spice trade initially had a limited impact on this, but by controlling both the north and central Moluccan islands, the VOC (Dutch East India Company) was able to expand and intensify production, while elsewhere groves were extirpated. The consequence was more environmental change, and the establishment of 'landscapes of exchange' that extensively transformed local ecology (Ellen, 2019a; 2019b), with maritime networks focused on small islands exchanging fish and trade goods for surplus sago from larger islands (Ellen, 1979; 2003).

Early development of the Moluccas (especially Ambon) as a key area of VOC involvement was accompanied by growing Dutch interest in gathering intelligence on local resources (Cook, 2005), a functional niche that partly through happenstance led

to the appointment of GE Rumphius to the service of the Company. Rumphius worked tirelessly in providing information the Company needed, and wrote numerous accounts of the natural history of the Indies. The posthumous publications of Rumphius (2011), particularly *The Ambonese Herbal*, were to become a milestone of applied science in the tropics, and influenced the development of systematic biology. Subsequent exploration of the biodiversity of the Moluccas was inevitably an elaboration of the work Rumphius had first undertaken.

By the mid-nineteenth century, the Moluccas had become a colonial backwater, the centre of economic gravity shifting to Java and elsewhere. New marketable crops emerged to supplement and replace clove and nutmeg: damar resin, copra and rubber. Logging was less important than elsewhere in the Indies, but deforestation saw further ecological transformation and crop replacement. On Kei Kecil it resulted in a decline in sago habitats, the production of savanna and the increased importance of cassava (Soselisa & Ellen, 2013). Through Asian traders, a range of forest and sea products also fed into the economic mix, expanding a pattern that had existed for centuries, some products destined for Europe (e.g. bird feathers for hat-making) but mostly for other parts of the oriental emporium.

Environmental change in human contexts is a continuous process, but subject to variable speeds and trajectories. Processes we nowadays associate with degradation—deforestation, creation of *Imperata* grassland through crop intensification, and over-extraction of mangrove for fuel—were already underway during the early historic period of the colonial spice trade (e.g. Ellen, 2019a; 2019b), though new forces in the twentieth century began to exacerbate them: population movement, urban despoliation, petroleum extraction (on Seram by 1917–25: Monk *et al.*, 1997: 675–7), and later new kinds of plantation, mining, cement and plywood factories.

By the second half of the nineteenth century, revived interest in the economic prospects of the Moluccas was accompanied by growth in scientific expeditions, partly inspired by the organized enterprise of Dutch colonial science (Monk *et al.*, 1997: 881–6). The work of Alfred Wallace (e.g. 1869) again placed eastern Indonesia in the scientific spotlight, though less in terms of what it might contribute to a colonial economy than through Wallace's systematic collection of specimens, thinking on biogeography and his contribution to the theory of natural selection. Nevertheless, organized conservation science was not to have an impact until well into the period of Indonesian independence.

A bioculturally distinctive zone

To understand the shape and implications of the new social, political and scientific interventions that began from 1980 onwards, we must take into account what is distinctive about the zone occupied by the Moluccan islands (Figure 1). The area between Borneo and New Guinea, at its western side marked by the eponymous Wallace Line and on its eastern side by the Sahul shelf (Ellen, 2020: 3), is today known as Wallacea. Wallace noted this as a zone of biodiversity transition between Sunda and Sahul. For many animal and plant groups, there was a dramatic shift in species from one side to the other, while the area as a whole was depauperate for these same taxonomic groups. Thus, east of Borneo and Java we see a decline in large Eutherian mammals and other terrestrial fauna and replacement by marsupials. The same pattern is evident for birds, though less marked for marine fish and invertebrates. Indeed, Wallace's main contribution to the description of new species was for insects and birds. Most large

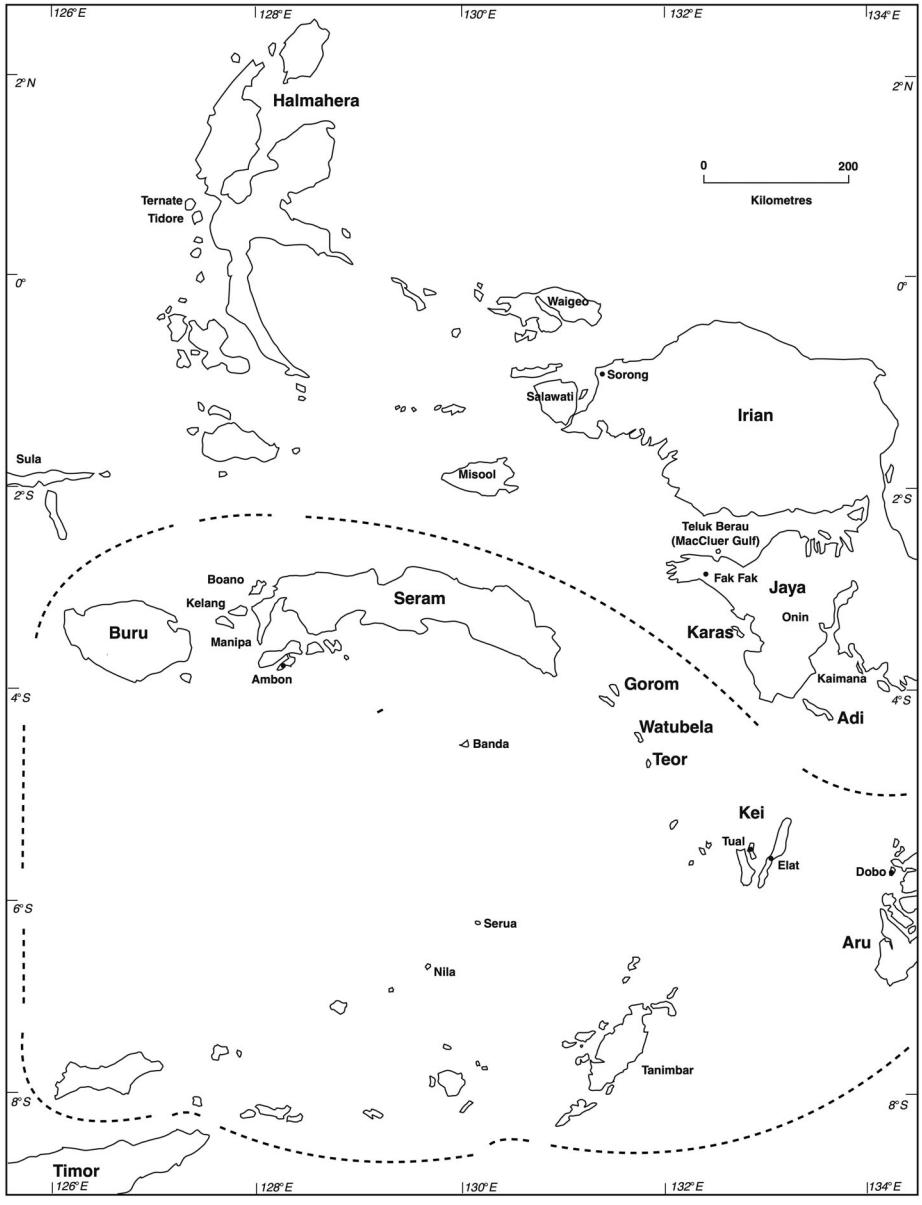

Figure 1. *The Moluccan islands showing main places mentioned in text. The broken line delineates the contemporary boundary of Maluku province.*

animals are introductions: the deer from the west, and the cassowary, warty pig (*Sus celebensis*) and two species of phalanger from New Guinea by 7000 BP. The shift for flora is mainly from the dipterocarp forests of large islands such as Borneo to forests with few or no dipterocarps, but instead the appearance of eucalypts, more distinctive of the Australo-Pacific. On Seram, the main families in lowland areas include *Myrtaceae*, *Myristicaceae*, *Lauraceae* and *Guttiferae*, with few clear dominants, confirming patchiness of species composition (Edwards *et al.*, 1990; 1993: 1–12; Ellen, 2007).

Here we focus on that part of Wallacea lying within the boundaries of the contemporary province of Maluku. This is not entirely arbitrary, as the geographic Moluccas circumscribe an area best exemplifying the characteristics of Wallacea as a whole, with a specific historic ecology and economic history. It is a suitable bounded entity for an analysis of the relationship between biological and cultural diversity. Biologically, although depauperate in terms of total terrestrial species, the Moluccas display high species endemism, for example for birds and mammals compared with Java and Sumatra (Monk *et al.*, 1997: 778–9, Figure 11.1). The marine ecosystems of the Banda and Arafura seas have amongst the highest species endemism in southeast Asia (Monk *et al.*, 1997: 817).

Following Maffi (e.g. 2005), we understand biocultural diversity as living diversity in all its interrelated and possibly coevolved forms—biological, linguistic and cultural—within a complex socio-ecological system to which it contributes resilience. For the Moluccas overall, among those features contributing to biocultural distinctiveness is high linguistic diversity (117 languages: Taber, 1996). Seram has an especially high density of languages (35). Linguistic diversity is significantly correlated with high biodiversity globally, and Wallacea is one of five classic biodiversity hotspots. There are upwards of 300 languages in Wallacea compared with between 870 and 970 for New Guinea (Gorenflo *et al.*, 2012). However, in Seram, species richness levels of mammals and reptiles are low, due to sea barriers preventing dispersion, and smaller land surfaces not supporting sufficiently large populations for viable breeding, plus humanly-induced extinction. While a complex history of human movement has provided opportunities for language diversification, that same human movement within a small area has disproportionately modified the landscape.

But in explaining high levels of biocultural diversity, we need more than a correlation between language and biodiversity. Biocultural diversity also results from inland settlement patterns comprising small dispersed hamlets, systematic plant selection, a wide distribution of folk knowledge of the natural world, low population densities, long-fallow swiddening and adaptation to special ecosystems; and involves implicit accumulated knowledge that local people rarely articulate but which has led to beneficial changes over generations. Both forests and coasts are dynamic systems maintained through human interventions, in which different subsistence strands interconnect in complex ways, subject to progressive change over many centuries. Present biocultural diversity is the outcome of patterns of human-resource interaction at different periods in the past, and investigating it requires the tools of historical ecology, as well as the emerging findings of how local knowledge systems make effective ecosystem management possible.

The earliest evidence for human occupation in the Moluccas as a whole are archaeological traces from between 55 000 and 31 000 BP (Spriggs, 1998: 53–4). There is no direct evidence (such as pollen or charcoal) in the subfossil record to provide clues about the first appearance of farming. Comparative Indonesian evidence for human activity, suggests repeated biomass burning interrupting ecological successions as far back as 50 000 BP, perhaps linked to El Niño Southern Oscillation variation (Ellen, 2020: 4–7). Plant geography also suggests human agency. Domesticated banana hybrids, sugar cane, the greater yam (*Dioscorea alata*), taro and sago (*Metroxylon sagu*) all moved early from New Guinea or were partly domesticated in eastern Indonesia. Freshwater swamps on Seram are dominated by *Metroxylon*, the main source of dietary starch for at least 1000 years. Swamp ecosystems are managed through selective harvesting of palms before sexual maturation, and transplantation of clonal suckers,

while sago management and reliance has influenced the wider landscape by mitigating forest conversion (Sasaoka *et al.*, 2014). Genetic recombination occurs where palms flower, fruit, seed and germinate without human intervention. It is likely sago spread under human agency, which maintained high levels of clonal diversity. Such diversity reflected in local language naming is closer to New Guinea than to any islands further west, indicating long-standing co-evolution between humans and sago (Ellen, 2004). Only in the twentieth century have serious inroads been made into swamp landscapes, through neglect, dietary change or removal through deliberate draining and road building.

There was low-intensity swiddening and arboriculture in the Moluccas as early as 28 000–13 000 BP, most likely focused on a small number of crucial nut- and seed-yielding trees, such as *Canarium, Aleurites* and *Pandanus*. As well as clove and nutmeg, certain managed tree species modified Moluccan forests from the early common era onwards, the product of generations of selective interaction (deliberate and inadvertent), optimizing usefulness and enhancing diversity. The distribution of *Canarium* species in lowland Seram is only explained through long-term anthropic influence (Ellen, 2019b). The establishment of more extensive swidden cultivation was underway at the same time, altering forest dynamics through managed long fallows. For several millennia the extraction of non-domesticated forest resources and the life histories of settlement sites have been inseparable from the impact of forest-fallow swiddening. This has impacted lowland forest at a rate of about one hectare a year per household for several millennia, with regrowth modified to increase its utility by planting trees (Ellen, 2007: 59–62; 2010: 124; 2020: 7). Modern studies show swiddening increasing the number of species and cultivars of major cultigens. Encouragement of disturbance vegetation also creates habitat and selection for a range of plants used medicinally and for other purposes. As we go back in time, it becomes increasingly reasonable to see swiddens as a means of producing economically productive managed fallow, rather than fallow being simply a means of restoring forest to make further swiddens.

In addition to swiddening, management of non-timber forest products and growth in spice production, the historical period witnessed other agents transforming land use and plant ecology: timber extraction (Ellen, 1985), population movement, and new plant introductions. European contact with the New World between 1500 and 1900 saw the introduction of large numbers of cultigens of Amerindian origin, to some extent replacing existing cultivated species (especially *Manihot esculenta, Xanthosoma*, sweet potato, papaya, and chilli). The rise of regional and global trade changed the habitats of small islands through over-extraction (e.g. of mangrove for fuel), coral mining, land reclamation and sea defence. By the late nineteenth century, the importance of spice trading had declined, but the period saw significant landscape changes through agroforestry (*Agathis dammara*) and other estate crops, such as coconut and rubber (*Hevea brasiliensis*). Since the 1980s, the main human impacts on forest have been through logging and transmigration, and, since 2008, through oil-palm plantations in north Seram (Liswanti *et al.*, 2013: 4). All this must be set alongside a dramatic rise in overall population growth up to 2020 (City Population, 2023).

For the modern province of Maluku, five biogeographic units have been identified (MacKinnon & Artha, 1981): Banda Sea, Aru, Kei, Seram (and Ambon) and Buru. But this broad classification takes no account of some varied local habitats. Seram, with its higher altitudes, has the greatest gamma diversity, and number of types of habitat within the region, while we need to acknowledge the patchiness of lowland rainforest, the significance of swamp, and the many ways in which human activity has influenced

them as described here. The special characteristics of the Moluccas are therefore contingent upon—and encompass—a variety of socio-cultural forms reflecting its transitional geographic position and complex history.

Modern conservation discourse and activity in Maluku

The first decades of Indonesian independence saw relatively slow economic development in Maluku. This was initially in part due to political destabilization associated with the attempt to establish an autonomous Republik Maluku Selatan (RMS, the Republic of the South Moluccas). The RMS period was one of relatively little environmental change because of this, and of even less conservation activity. However, the stability of the later New Order (from around 1970) and the post-Suharto policies of reform and local autonomy after 1998 saw expansion and consolidation of extractive political economy with major consequences for biodiversity conservation. Expansion and liberalization of the economy from the 1980s led to increased logging, mining, transmigration, road-building, off-shore fishing, petroleum production, and new plantations, particularly oil-palm. Communal conflict between 1999 and 2003 focused largely on religious and ethnic allegiance resulted in a brief growth hiatus, population displacement, government inability to enforce regulatory regimes, resource conflict between local communities, illegal extraction of forest and marine products, and its attendant corruption.

Threats posed by these developments were not immediately matched by the scientific groundwork necessary to measure their scale, or the political incentives necessary to counter them. Research on the biota of Maluku during the first three-quarters of the twentieth century was slight compared with that in western Indonesia outside Wallacea: mainly exploratory natural history in the taxonomic and descriptive mode. Some habitats are still understudied. Data on the sago palm (e.g. Ellen, 2006; Schuiling, 2009) is widely available, but the swamp ecosystem in which it is the keystone is little understood. Internationally, the rise of theoretical ecology and tropical forest ecology underpinned research in equatorial regions more generally. Much of this involved models based on the 'functionalist' assumptions of biologists such as P.W. Richards (1952) with their notions of a static pristine rainforest and stereotypical or 'essentialised' climax forest, ideas now heavily critiqued (Johns, 1990: 144; see also Blumler, 1996: 31). Since Richards, our understanding of rainforest ecology has been revolutionized by recognizing the variability of its habitats, its 'patchiness', and the discovery that rainforests in Maluku as elsewhere have complex ecological cultural and social histories (Edwards *et al*., 1990; 1993: 1–12; Ellen, 2007).

This legacy still haunts conservation-inspired projects everywhere, which continue to evoke 'timeless ecosystem' rhetoric, often ignoring complex socio-cultural and ecological histories which implicate the re-arrangement and co-evolution of biota over many centuries. We argue that conservation interventions in Maluku would be better if some account was taken of this history. Even today, internationally-funded projects tend to adopt a narrow historical time-window, employing large data sets framed in terms of propositions and problems identified at a global or sub-global level. Although many recognize the importance of social factors and of involving local communities and researchers, they still often ignore the wider social and historical picture in particular locations, squeezing-out relevant proximate factors, perspectives and issues, and this includes Maluku. In the worst cases, while incorporating such politically required tropes as 'poverty alleviation' and 'sustainable livelihoods' in their framing, science in

effect piggy-backs on more widely-conceived development projects in order to achieve objectives gathering more peer esteem.

With the rise of the environmental movement in the West and globally, scientific ecology has become increasingly linked to conservation and environmental activism. With the increase in conservation inspired-research and activist projects in the Moluccas from about 1980, ecology became the underlying approach, though still a 'nascent field' (Monk *et al.*, 1997: 5). The Indonesian government established a ministry for environment by presidential decree in 1978 inspired by the 1972 World Environment Conference in Stockholm. In 2014, it merged with the Ministry of Forestry, thus—in name at least—seeming to prioritize the place of forests in the environment. Provincial departments of environment followed, that for the Moluccas being established in 1982 in the form of the Bureau of Population and Environment. The government took an increasing role in framing environmental legislation and issuing decrees (Appendix S1), encouraged by the role of influential public intellectuals (e.g. Soemarwoto, 1983).

Growth in conservation interest at the provincial level was reflected in the establishment of an Environmental Studies Centre at Pattimura University in 1982, and provision of environmental impact assessment courses. There were some high profile Maluku-based studies of particular species and ecosystems, for example on mangrove, and monographs such as Edwards *et al.* (1993) on Seram. The first specifically local environmental NGOs began to appear, notably Hualopu founded in 1988 by university staff, later succeeded by Jaringan Baileo and then Yayasan Baileo Maluku. Others followed and conservation initiatives in Maluku, as elsewhere, now take a variety of institutional forms: international NGOs and research institutes; government and its agencies; national NGOs; local, regional and professional associations; university and research institutes; community-based groups; and groups rooted in religion, such as those embedded in the GPM (Moluccan Protestant Church) in south Tanimbar, and in feminist issues, as in a chapter of AMAN (Aliansi Masyarakat Adat Nusantara: Alliance of Indigenous Indonesian Peoples) (Table S1).

Protected areas

Central government has historically taken the initiative in establishing national parks and other protected spaces. In Maluku, nature reserves were established at Wae Mual and Wae Nua on the island of Seram by Ministerial Decree in 1972 (Wind & Amir, 1978). The Manusela National Park which opened in 1997 has incorporated these. By the late 1990s, numerous types of protected area had been in theory established in the province as it then existed (Table S2), under the auspices of the Directorate General for Forest Protection and Nature Conservation (Perlindungan Hutan dan Pelestarian Alam). However, of these, only half had been gazetted or were functional by 1997. Since then, others have come into existence and others ceased to exist. Appendix S1 lists recent relevant legislation relating to biodiversity conservation in Maluku as the provincial boundaries exist today.

The eleven marine conservation areas (Kawasan Konservasi Perairan) established in Maluku by ministerial decree between 2016 and 2022 are managed as 'parks' divided into zones. There is a core zone for conservation (*zona inti*), a limited use zone (*zona pemanfaatan terbatas*) for tourism, fishing, aquaculture, and residual designated zones (*zona lain*). These might include areas for mangrove protection, for rehabilitation, moorings or harbour, and areas subject to customary management (*hak kelola adat* and *sasi*). Recognition of customary practices was supported by involvement with local and

national NGOs, such as WWF-Indonesia and LMMA-Indonesia (Locally-Managed Marine Area Network) at the planning stage, although in practice not all users are aware of zones and their boundaries.

The priority given to protected areas in Indonesia as a whole reflected conservation priorities and theories of the time, conceptualized and administered on an essentially top-down basis. Problems arose in Maluku as elsewhere because of overlapping and unclear areas of responsibility between different government departments and agencies, especially for forest management, a misunderstanding of the long-term role of local people in managing forest and their dependence on it, and denial that much lowland forest in particular was the outcome of swiddening and fallow management over many centuries (discussion in previous section, also Sasaoka, 2018). It is not surprising that 'fortress conservation' or 'separate but exclusive' schemes ran into problems where there was blurring between traditional land or waters and areas officially protected, and where local people living along the edges of allegedly protected areas extracted resources within them. On a global scale, these problems were tackled through IUCN policy changes in 1980 which brought people back into the picture. In Indonesia, this was reflected in the Conservation Act of 1990 which emphasized buffer-zones. Despite these changes there are numerous documented disputes between local peoples and government authorities relating to accessing protected areas.

Local NGOs and community-based conservation

A turn in global thinking influenced by a combination of academic anthropology and ethnobiology, other proponents of indigenous knowledge, green political theorists, international NGOs and local activist groups, was already beginning during the 1980s. This looked toward cultural practices that might support community-based conservation objectives (Western & Wright, 1994). The earliest conservation groups in Maluku had already recognized cultural traditions as bound-up with protection of the natural world, and were intrinsically 'biocultural'. This is reflected in the titles of groups (e.g. 'Hualopu' and 'Baileo'), and there was some merging in the strategies of international conservation and the activism of local people at this time, 'indigenous' or not. In Indonesia, this linkage has been fostered since 1985 through increased informal and thereafter formal state recognition of the role of *adat* or customary arrangements.

NGOs and community-based conservation groups operating in Maluku are listed in Table S1. What is remarkable is the number of organizations and velocity of their growth, stimulated through local political opportunities and concern but also by the availability of national and international funding. Where interventions have been driven by time-limited projects, where funding sources have dried-up, the NGOs have ceased to operate and communities have been left without support. A feature of most projects has been partnerships between different organizations and funders, at all levels and pursuing various agendas. An example is the Critical Ecosystem Partnership Fund (CEPF) which has backed 80 projects targeting biodiversity hotspots in Wallacea. CEPF is a joint biodiversity conservation initiative of l'Agence Française de Développement, Conservation International, the European Union, the Global Environment Facility, the government of Japan, and the World Bank. It has funded work on sustainable natural resource management in 18 key biodiversity areas (KBA) on Seram. Of the NGOs based in Ambon, we might usefully examine two examples: Yayasan Baileo Maluku and LPPM.

By 1991, Baileo Maluku was fostering conservation rooted in customary ritual practice (*adat*) in coastal areas. Since 2004, it has been involved in a range of projects with

other local NGOs, national and overseas organizations (Appendix S2). A recent project has sought to revitalize and strengthen customary *adat* institutions and management of coastal resources on Nusalaut, partnering the provincial department for marine affairs and fisheries (Dinas Kelautan dan Perikanan) in an integrated area management plan. The role of Baileo Maluku here arose from its dissatisfaction with the 2018 draft zoning plan that failed to recognize the existence of the customary rights and practices of local peoples (*masyarakat adat*).

LPPM (Lembaga Partisipasi Pembangunan Masyarakat: the Institute for Participatory Community Development) has been equally active. Between 2016 and 2019 it conducted the project 'Revitalizing Local Wisdom in Sustainable Natural Resource Management on Buano Island'. This included capacity building and strengthening the role of customary leaders in managing local natural resources, and funded by CEPF with Burung Indonesia as the Indonesian implementing body. LPPM has worked with other organizations on Buano, namely Tanah Air Beta, supported through the Wallace partnership fund of CEPF, Coral Triangle Center (CTC), WWF and USAID. These operated within the framework of government plans to protect marine areas, especially around small islands. From 2019 to the present, LPPM, supported by the Samdhana Institute in Bogor, has worked on a document on local *adat* to be submitted to village authorities on Buano, to serve as the basis for recognizing at district government level the conservation role of Buano people.

The role of 'sasi'

In the Moluccas, a local institution pre-eminently relevant to conservation is *sasi*, now an icon of community-based activity. In the form that attracted most attention, this concerned ritual arrangements for regulating access to marine resources by delineating open and closed seasons (e.g. Harkes & Novaczek, 2003; Kissya, 1995; Zerner, 1994; Soselisa, 1998; 2001; 2019). Such initiatives were less spontaneous eruptions of indigenous knowledge into the public sphere as deliberate attempts by academics and government officials to find contemporary relevance in traditional practices (e.g. Bubandt, 2005). They were even to influence government policy at the highest level when Emil Salim was a minister with environmental responsibilities between 1978 and 1993. In the aftermath of the 1999–2003 communal conflict, *sasi* and other *adat*-based arrangements were again actively harnessed by local government to serve inter-communal reconciliation (e.g. Al Qurtuby, 2016). As Frost (2001: 11, 13) puts it, '*sasi*'s presentation as "indigenous" and as a system for "resource management" serves a number of different political ends, not all of them ecological'. For example, in Tanimbar (Frost, 2001: 11–15), closure periods in the 1990s were lengthened to allow time to work on other village projects, or when prices rose to deter the temptation to preemptively harvest, or to generate village revenue, or when officials were accused of corrupt use of the fining system, and when opening of a *sasi* was determined less by regeneration of stock than by arrival of *Trochus* or copra traders. A recent case from Aru (2013: Appendix S3.1) demonstrates how *sasi* is used as a wider political strategy in a long-running protest over attempts by the government and a private company to establish sugar-cane plantations and cattle ranches.

Similar cultural arrangements are reported for Seram (Ellen, 2016), suggesting that it is sometimes more accurate to see biodiversity conservation as a by-product of regulations adopted for other reasons. Nuaulu clans in south Seram establish long term zones of resource-rich protected forest (*sin wesie*) to ensure timber for sacred houses and food provisioning for accompanying house-building feasts. The composition of

these zones, supported by ritual sanctions, reflects the age and successional stage of long fallows (Ellen, 2007; 2020: Appendix 4). The interventions, together with continued use of old village sites and management of long-term fallow have encouraged high species richness. Sasaoka and Laumonier (2012) have described a system of forest lots in the Manusela area serving similar purposes.

Recognition of *sasi*, sometimes by government agencies, sometimes by churches and other secular non-governmental organizations, was part of a process (admittedly uneven) by which agency was returned to local populations in terms of environmental regulation. In a more exaggerated form, it sustained the narrative that forest peoples, such as Nuaulu, were 'guardians of the forest'. This designation is one the protagonists themselves have been happy to accept, for example in disputes over land claims. Some researchers regard the description with scepticism (Kristiansen *et al*., 2021), arguing that traditional ways of life increase risks and threats to livelihood. But, although in times when population densities were lower and forest more extensive the impacts of people like Nuaulu on the environment were on balance positive (and negative impacts therefore negligible), as forest was destroyed around them due to logging or land settlement, their own negative impacts were magnified. The impulse of Nuaulu during the 1980s was to take advantage of opportunities created by forest destruction. They later realized the damage done, re-orienting their rhetoric and practice, re-framing issues that were essentially about land and resources in environmentalist terms. So, Nuaulu who began by welcoming logging companies, later regretted their actions as they witnessed the consequences in ecological degradation, and as they were drawn into court cases (Ellen, 1999).

Nuaulu were slow to combine with other indigenous groups in a similar position. By the 2020s, with further conflict around logging concessions (*Mongabay*, 2020), some leaders were seeking the support of nation-wide NGOs, such as AMAN which was able to draw together the experience of widely-dispersed groups into collective national action, stressing their commonality as *adat*-based communities. In 2012, PT Bintang Lima Makmur was granted a concession permit for a large area overlapping the traditional territories of 10 Nuaulu clans. This damaged forest around the sacred sites of origin villages, also causing a reduction in the number of marsupial cuscus available for food and ritual. Defending their interests, Nuaulu held demonstrations and meetings with provincial government officials in Ambon (2018), even visiting the Ministry of Environment offices in Jakarta. In a recent development (April 2020) the newly-formed Nuaulu Student Association (Himpunan Pelajar Mahasiswa Nuaulu) released an open letter to the governor of Maluku, the regent of Central Maluku, and the representative council of Central Maluku demanding that the permit granted to PT Bintang Lima Makmur be revoked.

Discussion

Biological degradation remains a major issue in Maluku despite the activity of governments and non-governmental groups: deforestation on the larger islands (Global Forest Watch, 2023), over-fishing in marine environments, unregulated intrusions into protected areas, conflict between local people (including transmigrants), timber companies, local government and park management. There is ongoing depletion of mangrove and coasts generally are under pressure. Plantation monocultures (nowadays including oil-palm and cacao) continue to expand (Mitchell *et al*., 2022), as does oil and gas extraction (Explorogi, 2016; Soselisa & Soselisa, 2019). Uncontrolled urban and

industrial pollution is poorly-managed, e.g. that emanating from fish-processing and prawn-farming (Liswanti *et al*., 2013). Over the decade 2013–23 Maluku was recorded in national BPS data as the fourth poorest province in Indonesia, with many non-sustainable livelihoods, and few wage employment opportunities. There are problems in averting 'tragedy of the commons' type situations, and grappling with complex land tenure regimes. In the face of this, social and political will is buckling under the strain, with few resources to tackle corruption, weak law enforcement, bureaucratic inertia and poor liaison between relevant ministries and agencies.

In examining the emerging pattern of discourse, we find a cacophony of different voices around different aspects of the conservation-development conjuncture: government, international, national NGOs, groups based on ethnicity, language and religion, and urban-oriented groups (such as Green Moluccas) cutting across civil society. Some local communities referred to above have embraced projects that accord with their own interests; elsewhere these cause resentment. Growth in public understanding of conservation through media attention has aligned community interests with global environmental activism, where these relate to access and management of resources, and conflict between insiders and outsiders. The way communities respond is driven by material concerns expressed through available cultural resources (see e.g. Ellen, 1999), which now extends to environmentalist rhetoric combining claims to indigeneity and land. How then can the increasingly large number of voluntary migrants (such as Butonese) and transmigrants identify with the rhetoric and activity of land-based *adat* communities? Moreover, as local NGOs and community-based groups collaborate and overlap in their work and objectives, which 'community' are we talking about?

The groups claiming to conserve biodiversity in Maluku operate at different scales and are socially-constituted in different ways, with different agendas and impacts. For example, large international multi-agency projects are sometimes concerned to test relationships between society and environment regionally or globally (e.g. Mitchell *et al*., 2022), but often miss what is going on in particular local communities from a holistic perspective. Their findings may be relevant, but mainly at a central governmental or inter-governmental level. Most of the groups and projects discussed here have not existed long enough to properly measure their effectiveness. In many cases, withdrawal of funding, under-resourcing and lack of long-term management, a break-down in co-management relations, or changing circumstances has resulted in failure or weak responses.

The problem of conservation in Maluku is less recognition that a problem exists, or a lack of will amongst interested parties, than failures of governance. There is a fundamental asymmetry (Langston *et al*., 2020: 414): horizontal and vertical disconnects between government sectors, companies and civil society. Effective conservation requires integrating diverse factors in the landscape, conflicting aspirations, government economic ministries, conservation and development priorities of government together with existing management practices. Official engagement and recognition of the role that cultural revitalization and local institutions such as *sasi* might play at least creates a political space in which the mutually-supporting relationships between conservation and development can be negotiated. This is a challenging prospect. As Langston *et al*. (2020: 18) point out for Seram, Maluku 'provides lessons on the conditions under which landscapes on the periphery of state control might become places for innovative sustainability outcomes, and where science can strategically situate itself to achieve impact'.

Conservation activity in Maluku does not necessarily conflict with local livelihoods, but wider economies have tended to incorporate traditional economies, creating the conditions for underdevelopment through capitalist relations of production without any appreciable local change. Community-based resource management risks replicating previous patterns of disadvantage re-presented in environmentalist terms (Li, 2002: 278). However, there is increasing realization that 'the impacts from well-managed smallholder agriculture and social forestry are less extreme, as the associated land parcels are typically embedded within landscape mosaics comprising fallows and forest remnants' (e.g. UK Research and Innovation, 2018). At the very least, conservation underpinned by effective community-based groups provides a safety net, since existing practices do less damage than what might replace them.

Community-based conservation expressed through the concept of *masyarakat adat* has been used to challenge governmental organizations and private companies over forest and land rights. Here we have show-cased the Nuaulu of central Seram, but there have been protests against marble mining around Taniwel in northwest Seram (e.g. *Suarapaparisa*, 2020), threats to traditional damar (*Agathis dammara*) groves in west Seram (Soselisa, 2021: 82–3), and among the Sabuai of east Seram (Appendix S3.2). These groups adopt tactics used in political protest more widely: street demonstrations and protests at the offices of executive, legislative, and judicial authorities. They call for action, read open letters, carry banners bearing various demands, claims and assertions, and submit statements signed by *adat* authorities. These are driven and dominated by young people, especially students at universities in Ambon. Some involve *adat* leaders. In some movements individual actors stand out as leaders, as in #SaveAru (Appendix S3.1). This contrasts with what was possible under Suharto's New Order. Apart from changes in political conditions, people living in remote areas now have access to the tools of engagement through improved education, transport infrastructures and electronic media. This enables communities to directly communicate with the state, in their own voice, concerns about their lives and environment. In this context, *sasi* is less a pragmatic means of resource management than a symbol of the status of *adat* communities placed at the very centres of economic and political power. It also highlights the weakness of existing national and international laws connecting environment and the resource rights of local people, which we can see in demands to ratify the draft law on indigenous peoples (*RUU Masyarakat Hukum Adat*).

The effectiveness of recent community campaigns has been enhanced by use of (especially electronic) media. Online newspapers, blogs and other platforms, facebook posts, Whatsapp groups, and even a change.org petition have all been deployed to mobilize local groups, gather support amongst stakeholders and other parties, not only in Maluku but widely in Indonesia and internationally. The target audiences include NGOs, academics, researchers, students, young people, government employees and other indigenous people elsewhere. Such media perceptions of conservation at the community level increasingly provide the context in which external actors plan interventions.

Conclusion

Historically and worldwide, conservation organizations and projects began by operating independently of other development goals, with specific biodiversity objectives. However, it was clear by the 1990s that there were many implications and cross-overs between conservation, economic development and socio-cultural identity, which were

directly threatening existing human livelihoods. At the same time, it was evident that local biodiversity was an outcome of different human inputs over millennia. Some Western-based conservation projects sought to legitimize scientific conservation objectives by emphasizing their advantages in terms of development, both to satisfy the demands of funders and the expectations of gatekeepers at various levels in host nations. This has encouraged bigger projects, with bigger budgets, with 'sustainability' and 'poverty alleviation' objectives.

Among the main findings of this paper have been a demonstration, we believe for the first time, of the wide and diverse range of recent conservation activity in one area of Indonesia, Maluku. We offer, therefore, a more panoptic, in this case, province-wide view. Moreover, we have shown how local, regional, national and international inputs are interconnected, and how in turn, these interface with political and cultural agendas specific to Maluku. We have also shown in adopting an historical approach, how these conservation realities are grounded in the economic history of a region, Wallacea, with a complex transitional biogeography and ecology.

Several of the issues we have explored with reference to Maluku have implications for future research plans and conservation interventions led by external actors and for the study of contemporary trends more generally. In order to understand biodiversity conservation practice in contemporary Maluku, we must take into account not only what is happening in particular localities, but how those localities differ and are connected spatially, economically and administratively. Historical anthropic forces have shaped the ecological picture we find today. Conservation projects and politicization of conservation rhetoric are embedded in the economic and social history of particular places, which in turn are part of wider historical ecologies. High levels of biodiversity in Maluku are linked to an historical ecology motivated by human activity and population diversification in language, culture and practice, while indigenous environmental knowledge loss reflected in language loss has real ecological impacts. We can express this through the measurable index of biocultural diversity, but it must also be understood less as a simple relationship of mutual causality between cultural and biological differences than a complex association that needs to reflect specific local features of ecology and socio-economic history.

In examining emerging patterns of conservation discourse and activity, we find frequent appeals to cultural values and practice and to revitalization of customary institutions. While a global trend, this has a distinctive character in Maluku that we might expect to shape local conservation impacts. Different voices mark aspects of this conjuncture, and reflect different ecologies and socio-cultural experiences. It is difficult to generalize local population knowledge and management of the environment given the wide variation between different kinds of population and their interests, and how local communities respond is motivated by material concerns expressed through the political means available to them. Environmental activism often combines claims to resources and livelihoods, making recourse to indigenous knowledge, local customary traditions and the public language of science wherever these might be supportive.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Appendix S1: Legislation relating to biodiversity conservation in Maluku. Government decrees issued at national, provincial and regency level concerning Marine Protected Area, Kawasan Konservasi Perairan (KKP).
Appendix S2: Selected projects in which the local NGO Baileo Maluku has been involved in since 2016. Some abbreviations used in this appendix are explained in Appendix S1.
Appendix S3: Two cases in which *adat* has been harnessed to environmental activism in opposing government and private sector agribusiness projects.
Appendix S3.1: Sugar cane plantation, cattle ranching and the #SaveAru movement.
Appendix S3.2: Logging, sacred forest and change.org in the Sabuai area of east Seram.
Table S1: The institutional form of conservation initiatives in Maluku.
Table S2: Protected and conserved areas (ministerial and gubernatorial decree) in the province of Maluku as of 2022.