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From absences to emergences: Foregrounding traditional and Indigenous climate change adaptation knowledges and practices from Fiji, Vietnam and the Philippines

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ABSTRACT

The differential impacts of climate change have highlighted the need to implement fit-for-purpose interventions that are reflective of the needs of vulnerable communities. However, adaptation projects tend to favour technocratic, market-driven, and Eurocentric approaches that inadvertently disregard the place-based and contextual adaptation strategies of many communities in the Global South. The paper aims to decolonise climate change adaptation guided by the critical tenets of 'Decolonising Climate Adaptation Scholarship' (DCAS). It presents empirical case studies from Fiji, Vietnam, and the Philippines and reveals the different ways that Indigenous and local knowledge (ILK) and strategies are devalued and suppressed by modernist and developmentalist approaches to climate adaptation. The paper then foregrounds some of the adaptive techniques that resist and remain, or have been re-worked in hybrid ways with ILK. Ultimately, this paper combats the delegitimisation of ILK by mainstream climate change adaptation scholarship and highlights the need for awareness and openness to other forms of knowing and being.

1. Introduction: The neo-colonial takeover of climate change adaptation in the Global South

Since the early 1990s, climate change adaptation has emerged as a dominant theme in development praxis. Governments, aid agencies, and nongovernmental organisations (NGOs) have mobilised a significant number of resources and embarked on several programmes focusing on climate adaptation (Mikulewicz & Taylor, 2020; Sovacool et al., 2017). Climate change is seen as an existential threat to humans everywhere and adaptation is consequently viewed as an urgent and almost universally recognised imperative across the globe (Atteridge & Remling, 2018; Taylor, 2014).

However, existing body of literature suggests that climate change is dominantly framed as particularly dangerous for communities in the Global South – or countries with relatively low economic and industrial development where the majority of the world's population live (Bond, 2012; Fisher, 2015; Gaillard et al., 2017). Drawing from Said's (2003) concept of imaginative geography, critical scholars note that climate discourses manufacture an imaginary border between parts of the world that are supposedly safer (in Western Europe and North America) and those most regularly affected by extreme weather events in the Global South (Bankoff, 2001; Gaillard, 2010; Mikulewicz, 2020). Climate change is consequently depicted as a more imminent threat to a certain part of humanity, who therefore needs to be 'saved' by the knowledge and expertise of the other.

Critical scholars point out the arrogance of this artificial distinction between the climate vulnerability of richer and poorer regions of the world. Bankoff (2001) refers to the rhetoric of how places in the Global

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South are rendered vulnerable to climate change as a "Western discourse". He draws upon the ideas of Arturo Escobar (1995, p. 8) who describes development as akin to the process of 'colonisation' as it tends to create " a subjectivity with features of powerlessness, passivity, poverty and ignorance… as if waiting for the Western hand to help subjects along…" Recently, Mikulewicz (2020, p. 1810) takes this further, arguing that "mainstream approaches to adaptation rely on a parallel ontology of vulnerability, which warrants external assistance to those in climate peril" (Mikulewicz, 2020, p. 1810). Bankoff (2019) also claims that concepts such as adaptation and resilience remain culturally specific to Western perspectives.

The kind of 'Western perspectives' that Bankoff is referring to are evident in constructions that frame climate as outside human experience, positing a strict division between people and their environments (Wright & Tofa, 2021). Consequently, dominant climate policy interventions and discourses conceptualise climate as something that can be controlled and understood rationally. Adaptation strategies thus focus on top-down, technocratic, and command-and-control strategies such as building infrastructures, climate modelling and projections, and technology-based warning systems (Remling, 2018). However, critical scholars argue that there is fragility associated with this imposed linearity and control of climate and they continue to challenge discourses that obscures the diverse and place-based adaptation strategies that are embedded in local practice (Gibson & Hill, 2022; Ireland & McKinnon, 2013; Wright et al., 2020). There is growing evidence that approaches to adaptation within the era of what is varyingly known as Anthropocene or Capitalocene are in part responsible for producing people's vulnerabilities to climate change in the first place (Eriksen et al., 2021). While it is true that mainstream scientific knowledges have important insights to guide adaptation practitioners, an increasing number of scholars have stressed the need to engage with plural ontologies and epistemologies as these have been shown to play an important role in facilitating adaptation and resilience in many communities (Nursey-Bray et al., 2020; Rarai et al., 2022).

Drawing on case studies from Fiji, Vietnam, and the Philippines, this paper illustrates the value of diverse knowledge systems and practices in responding to the pressures of climate change. While variously referred to as traditional knowledges, ecological knowledges, and Indigenous knowledges among others, we elect to use the term Indigenous and Local Knowledges (ILK) because of its growing use in the literature and in prominent institutions like the Intergovernmental Panel on Climate Change (IPCC). By ILK, we refer to a place-specific nested knowledge system comprised of people's information about local environments, their ways of life, as well as their values and worldviews (Rarai et al., 2022). We also see ILK as complete knowledge systems alongside other knowledge systems and are inseparable from and interconnected with peoples' beliefs and practices (McGregor, 2021). In the case studies that follow, we demonstrate the critical role that ILK plays in facilitating people's adaptive capacities to climate change.

In the next section, we situate our work within the Decolonising Climate Adaptation Scholarship (DCAS) (Johnson et al., 2021). In this positionality, we advocate for recognitional justice in climate adaptation scholarship by explicitly diagnosing "how land and relations to land have always been differently understood and enacted" (Tuck & Yang, 2012, p. 7). Moreover, beyond the symbolic and metaphorical use of "decolonisation" (Tuck & Yang, 2012), we examine climate vulnerability as a product of historical and on-going colonial violence and bring front and centre colonised and Indigenous peoples' capacities and diverse adaptation strategies in our analysis. Drawing on DCAS, we then turn in Section 3 to our case studies. In order to examine the drivers of vulnerabilities in our case study communities and foreground their respective adaptation initiatives, we orient each of the case study discussions around two key questions: (1) what types of absences (i.e. silencing and suppression) are produced by Eurocentric approaches to climate adaptation, and (2) what types of emergences (i.e. adaptation initiatives and strategies) challenge the production of such absences? In Section 4, we present our key findings. Finally, we conclude by reflecting on the lessons our case studies offer for the adaptation industry – how adaptation approaches heavily cemented in "concrete" understandings and solutions (i.e. Eurocentric and modernist thought as well as built infrastructure) may not effectively address uncertainties associated with the impacts of future climate change.

2. Decolonial approaches to climate and adaptation scholarship

Climate change compounds many of the issues that communities in the Global South face including food and water insecurities, pressures on health and education, among others (Mbah et al., 2021; Sultana, 2021). We refer to the Global South as regions of Asia, Oceania, Africa, and Latin America that have a colonial history and are mostly low-income and often politically marginalised (Dados & Connell, 2012). It is within these regions that development models framed by Enlightenment ideas about modernity and progress are propagated (Cooper, 1997). Grosfoguel (2009) argues that the lingering effects of colonialism have seeped into the policies, institutions, ontologies, and epistemologies of Global South communities even after the end of colonial administrations. Quijano (2000) popularised the notion of "coloniality" to signify the continuation of colonialism through the enduring geopolitical supremacy and economic dominance of Global North nations. To overcome coloniality, scholars have called for a 'decolonial option' – an approach that recognises and values alternative ontologies and epistemologies that exists in the Global South (Escobar, 2018; Mignolo, 2018).

Decolonisation is a continuous political project of "individual and collaborative action to root out the weeds of colonisation" (Mercier, 2020, p. 43). Central to this is the decolonisation of knowledge to recognise and legitimise all other ontologies, epistemologies, and methodologies that have previously been marginalised, including ILK. To uproot colonial narratives, we draw attention to the physical and epistemic violence brought about by enduring forms of coloniality and highlight ILK and capacities that enable cultures, beings, and becomings. To us, part of decolonisation therefore entails interrogating how colonialism has contributed to colonised peoples' vulnerability and marginalisation (Bennett, 2014), as well as centralising their perspectives and interpretations of reality (Howitt, 2020). It requires learning from below (Spivak, 1993) and looking from within rather than outside communities (Gaillard, 2019).

Within the specific context of climate adaptation, we situate our work of decolonisation within the burgeoning literature called "Decolonising Climate and Adaptation Scholarship (DCAS)". DCAS builds on decades of push-back from scholars based in the Global South and scholars working with ILK. Johnson et al., (2021,p. 3) argue that the fundamental tenets of decolonisation literature run through large tracts of the DCAS scholarship including "examining and transforming oppression, foregrounding Indigenous ontologies, and supporting Indigenous strengths and self-determination". They also stress that DCAS represents a much-needed departure in climate adaptation scholarship. Many common framings of climate change obscure the massive destruction brought about by colonialism and capitalism (Wright et al., 2020). Critical scholars also observe that climate change discourses tend to be framed in terms of a range of dichotomies, e.g. natural versus human-made, us versus them, good versus bad (Davison, 2015; O'Lear, 2016). They also emphasise that climate is framed in a measurable and controllable manner, enrolling adaptation into dominant develop discourses wedded to biophysical science and colonial logics of modernity (Rarai et al., 2022; Webber, 2016). This leads to a pre-occupation towards a range of interventions that are technocratic and exclude from its frame of reference the broader colonial and political-economic context" (Cameron, 2012, p. 11). Moreover, such over-reliance on technocratic and Eurocentric expertise in relation to climate adaptation is generally unstable, and there are numerous studies showing how some interventions inadvertently exacerbate vulnerability and drive maladaptive outcomes (Eriksen et al., 2021; See & Wilmsen,

2022). For example, a case in Fiji illustrates that seawalls built to protect people from sea level rise have merely shifted vulnerability to people elsewhere and threatened the health of the marine ecosystem (Piggott-McKellar et al., 2020). Other research, such as that in the Marshall Islands, emphasises colonial and institutional structures that discourage local participation in adaptation programmes (Bordner et al., 2020). It is becoming increasingly clear that Eurocentric expertise needs to learn from diverse global contexts and that responding to climate change requires different ways of thinking and responding.

There are many strands of scholarship that attend to the neo-colonial injustices implicated in peoples' climate vulnerabilities as well as that feature their highly localised and place-based responses to climate change. These include the work of a wide range of Indigenous and non-Indigenous scholars, geographers, feminists, climate change activists, humanists, and other academics who have problematised the dominance of technocratic approaches to climate adaptation and have attended to the diverse and culturally imbued ways that humans are co-constituted and co-emergent with their environment (Do & Dombroski, 2022; Eriksen et al., 2021; Gibson-Graham et al., 2013; Puig de la Bellacasa, 2017; Wright et al., 2020). With this immense body of work in mind, we identify three dominant Eurocentric assumptions and understandings around climate and the way that such conceptions are being challenged by DCAS.

First is a linear conception of singular time. It relates to the idea that history has a linear direction and that "developed countries are ahead of, or more progressive than, underdeveloped countries" (Akıncı et al., 2020, p. 183). The perceived linearity of time suggests that whatever represents the opposite of forward is rendered backward and, thus, undesirable. Wright et al. (2020) argue that this strict linear formulation of time has extremely unjust consequences such as the silencing of the massive destruction brought about by colonialism upon the lands and seas of First Nations people across the world. In addition, when time is seen as singular, predictable, and model-able, too much attention is focused on the ability to forecast and predict the future (Natcher et al., 2007). Wright et al., (2020,p. 298) contend that when time is seen only as a linear march, fear-based narratives become dominant as "ideas of change rock the foundations… and responses become an effort to impose control through the very structures that led to the problem in the first place".

In contrast, DCAS literature promotes diverse temporalities and suggests that time is non-linear, spiral, and connects across different generations (Chisholm Hatfield et al., 2018; Janca & Bullen, 2003). For example, Wright et al., (2020,p. 297) discusses how the Yolŋu songspiral, Wukun or Gathering of the Clouds, from northern Australia understands "time is not something that is distant… with the past receding into the distance and the future inevitably bearing down". Instead, it emphasises the multiplicity of time, that the past and future co-exist in the present, and the impossibility of predicting or controlling climate in any unidirectional manner. Similarly, in her study of the relationship between soil science and economic productionism, Puig de la Bellacasa (2015, p. 693) decries the "persistence of a modern paradigm that associates the future with progress… while the past acts as a discriminatory signifier of development delay". She challenges the productionist linear time aimed at increasing soil's efficiency at the expense of all other relations and asserts that ecological relations require taking a diversity of timescales into account (Puig de la Bellacasa, 2017). Time is lived, embodied, and historically and socially situated, and the progressive and productionist mode of time is just one of the many forms of temporality (Adam, 1998; Bastian, 2009).

Second, we observe that Eurocentric perspectives continue to dominate the framing of the climate crisis and its potential solutions. Critical scholars argue that climate assessments are mainly based on Eurocentric paradigms that do not value other ways of knowing (Deranger et al., 2022; Overland & Sovacool, 2020). Moreover, Tandon (2021) notes that the existing knowledge around climate change is heavily skewed towards the interests of male authors from the Global North, marginalising the perspectives of women and communities in the Global South. For example, Gaillard (2019) finds that most of the published work on climate change are authored by scholars from the Global North. Furthermore, Eurocentric ways of knowing have long been accused of appropriating Indigenous knowledge for the benefit of non-Indigenous institutions (Smith, 2012). The dominance of Eurocentric perspectives in climate research forecloses on "a wealth of creative, innovative ideas and solutions required to transform human society" (Deranger et al., 2022, p. 57).

DCAS' underlying premise is that the epistemological and ontological diversity of the world is both immense and important. Escobar coined the term 'pluriverse' to describe how the world is actually "made up of multiple worlds, multiple ontologies or reals that are far from being exhausted by the Eurocentric experience or reducible to its terms" (Escobar, 2020, p. 69). DCAS understands a pluriversal world of adaptation, where scholars ask how we might "take the potential of multiple climate ontologies and epistemologies seriously, and what the consequences of this would be for climate adaptation in theory and practice" (Rarai et al., 2022, p. 2243). Thus, it calls for more grounded adaptation actions that are attuned to the perspectives and needs of local people, but not in terms of interpreting them into a single universalist truth or method. Instead, it embraces multiple worldviews and knowledges in climate adaptation (Ensor et al., 2019).

Lastly, we notice that the solutions proposed in responding to the climate crisis revolve around ideas of economic growth through market forces at the expense of environmental and social sustainability. For example, the response to the drought experienced by communities across Australia's Murray-Darling Basin were mainly "market solutions entrenched by intergovernmental agreements, which have seen rich investors buy water rights to create profit" (Howitt, 2020, p. 4). In Zambia, a new green revolution, focused on a private sector-led agricultural development, is being pushed to the detriment of the poorest smallholders (Westengen et al., 2018). Bruun (2018) similarly contends that development agendas characterised by financial and economic calculation are evident within funding mechanisms such as the Green Climate Fund. Such dominant preoccupations with economic growth and efficiency do not only exclude the more-than-human lifeworlds; they may also result to further marginalisation of vulnerable groups (Eriksen et al., 2021).

To counter this overreliance on market remedies and growth, we draw attention to scholarship that highlights a diversity of systems of production and consumption that capitalist understanding of economic activities and relations fail to capture (Gibson-Graham, 2008; Gibson-Graham et al., 2013). More specifically, we draw upon the notion of diverse economy in which what is usually conceived of as the mainstream economy – capitalist enterprise, market transactions and wage labour – are joined by all other economic 'others' (such as economies of solidarity, barter, and cooperatives, among others) that sustain life and well-being (Gibson-Graham, 2005). In the context of climate adaptation, a number of scholars provide examples of adaptation strategies that are not guided by the market logic of growth, but by criteria of reciprocity and sufficiency (Ireland & McKinnon, 2013; See et al., 2022). Other diverse economy scholars emphasise adaptation actions that go beyond modernist developmentalism and climate infrastructure, such as learning to be bodily affected by climate difference (Hill, 2014) or inventorying and building on diverse adaptation strategies already present within communities (Lopes et al., 2018). These examples counter grandiose visions of multinational institutions that are deeply implicated in neoliberal models of economic decision-making.

As a preliminary step in decolonising climate adaptation, we undertake two important actions in this paper. First, we foreground the various forms of absences and suppression that invalidate non-Eurocentric ontologies and epistemologies in the context of climate adaptation. In each of the four empirical case studies presented in the latter part of this paper, we highlight some of the more troubling aspects of climate change adaptation where different initiatives seem to follow

neo-colonial modernisations. Second, we highlight the diverse forms of emergences – the adaptive techniques and strategies that resist and remain, to articulate the diverse knowledges and practices that Global South communities are already engaged in to adapt to climate change. This paper seeks to contribute to the expanding literature of DCAS and heed Johnson et al.'s (2021) call to advance the decolonisation of climate adaptation scholarship and practice. It also builds on recent scholarship that recognises the importance of grounded and localised knowledge, experience and priorities in climate change research and planning (Khadka et al., 2021; Tschakert et al., 2017). We turn to our case studies next.

3. Drawing Connections: Introducing case studies from Fiji, Vietnam and the Philippines

Our authorial collective is led by researchers from Fiji, Vietnam, and the Philippines, with long-term commitments and access to knowledge through both formal research activities and through long-term relationships. We are also part of the Community Economies Research Network (CERN), an international network of scholars engaging with a 'community economies' approach to make more sustainable and equitable forms of development possible. Inspired by the work of (Gibson-Graham, 1996, 2006), the community economies approach represents a commitment to identifying, gathering, and amplifying ethical economic practices that already exist and that prefigure the world we want to live in. Community economies research is interested in 'looking for difference', i.e. identifying, making visible, and valuing diverse practices that enable communities to survive well together but are rendered invisible by dominant forms of knowing and being. This paper, a product of a series of exchanges and presentations during the 2021 CERN 'Liviana' Online Conference, is our collective attempt to challenge Eurocentric-dominated framing of climate change adaptation and open up new ways of seeing adaptation efforts taking place in local communities. It features case studies from Fiji, Vietnam, and the Philippines (Figure 1) – countries which the United Nations (2020) classifies as "at highest risk of negative outcomes from a changing climate due to their high vulnerability and low resilience".

Fiji is located in the South Pacific, an archipelago comprised of 330 islands, of which over 100 are permanently inhabited (Piggott-McKellar et al., 2019). It has a population of approximately 900,000, 57 % of which are Indigenous Fijians who live on customary land (Steven & Vunibola, 2022). Despite having mountainous terrains and a large land mass, climate change is increasingly affecting low-lying coastal communities in the country as many are becoming uninhabitable (Nichols, 2019). Additionally, recent climate-related disasters such as Category 5 cyclone Winston in 2016 have triggered the implementation of policies aimed to build Fijian's adaptive capacities (Lagi et al., 2022). However, Lagi et al.,'s (2023,p. 315) review of climate-related policies in Fiji suggests that "policies… do not offer frames that fully situate sustainable development within a holistic understanding of socio-climate justice, or fully recognise … the important role that Indigenous knowledges and practices…play". This is consistent with Rarai et al.'s (2022) observation that Pacific adaptation interventions often privilege Eurocentric knowledges and focus on technical solutions promoted by foreign experts.

In this paper, we feature the small village of Nawi which is situated

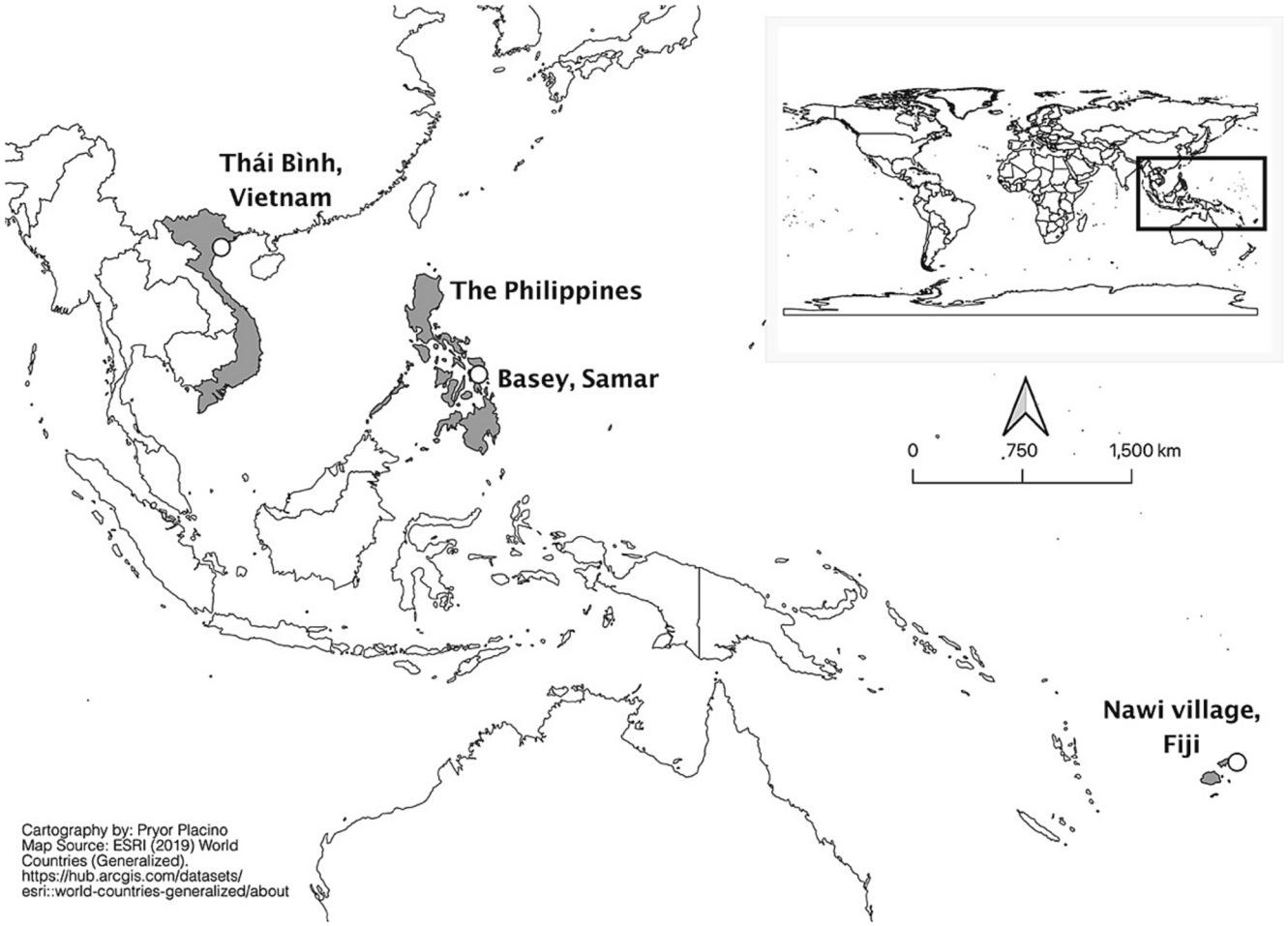

Fig. 1. Map of the case studies.

near the Nasavu river in the district of Dogotuki in Macuata Province. The village comprises only 25 households and is remotely located, with the nearest town (Labasa) being 150 km away. Here, people largely depend on the land and the river for sustenance and income. For example, kava (*piper methysticum*) and taro (*colocasia esculenta*) are grown for income and food. Their main diets include crops like yam, wild vegetables, cassava with fish, and clams from the river. Our Fiji case study is led by SV, who has both family and research connections to Nawi. He looked at how ILK helps support climate adaptation for local communities in Nawi. Talanoa, a culturally aligned Pacific research method (Farrelly & Nabobo-Baba, 2014), was used to gather information and community stories. Talanoa sessions were organised with community leaders, youths, women and teachers from the local Dogotuki District School.

Our second case study is located in Vietnam where the country's long coastlines and low elevation make it geographically prone to flooding and sea level rise (Lindegaard, 2018). Heightened temperature extremes, salinity intrusion, and changing rainfall patterns have also been attributed to climate change and have caused tremendous amount of damage and loss of life (Christoplos et al., 2017). Several adaptation measures have been implemented to address these risk, which scholars observe tend to "follow hierarchical mechanisms of planning and are associated with the development programmed intended to promote national level sustainable development" (Dombroski & Thi Do, 2019, p. 9). These top-down adaptation strategies have led to adverse effects on marginalised communities. For example, adaptation measures have been reported to disproportionately benefit landowners and penalise the landless in the Mekong Delta (Chapman et al., 2016). Other example include how the Ecopark green village in Hanoi was designed in a way that protected the local elites from climate impacts but evicted the poor (Thomas & Warner, 2019).

In this paper, we focus on Thai Binh province, a rural and coastal area known as the 'hometown of rice farming' in northern Vietnam. It has a population of 1,873,890, equivalent to 610,777 households (Thai Binh Statistical Office, 2021). According to the Department of Agriculture and Rural Development (2011), rice farming makes up approximately 60 % of the agricultural gross domestic product (GDP) in the province, making it the most important livelihood activity for its residents. Climate-related hazards such as salt intrusion, flooding, and drought thus pose a major threat to both rice production and livelihoods of its residents (Do & Dombroski, 2022). Our Vietnam case study is led by HTD, who has both family and research connections to Thai Binh, and supported by KD for over seven years. The research explored the effects of climate adaptation interventions on peoples' livelihoods, with special attention given to farmers' accumulated local embodied knowledges for adapting to climate change. Data were collected using a combination of focus group discussions, transect walks, and semi-structured interviews with farmers and local officials.

Our final case studies are located in the Philippines, a country in Southeast Asia composed of more than 7,100 islands clustered in three major island groups and has a land area of around 300,000 square kilometres (Jose & Cruz, 1999). Climate change has been a field of governmental intervention, with several legislations being passed that mandated the country's national adaptation priorities centre around food and water security, ecological and environmental stability, human security, and climate-smart industries and services (Climate Change Commission of the Philippines, 2011). However, scholars argue that these are highly top-down policies and included marginal consultation with its vulnerable sectors (De Leon & Pittock, 2017). Moreover, empirical evidence suggest that multiple levels of governments have divergent, often contradicting policy interests (Nabong et al., 2021) and that some adaptation projects have been marred by politics and controversies which lead to maladaptation (See & Wilmsen, 2020, 2022). Moreover, ILK and practices related to climate change adaptation have continued to be sidelined in government programs and services (Cuaton & Su, 2020, 2023). For instance, structural protection measures through the use of modernist building technologies such as concrete and steel are being promoted by the development industry as viable "technologies to support climate change adaptation in developing Asia" (Asian Development Bank, 2014, p. 1). However, scholars claim that these materials are energy intensive and emit high levels of greenhouse gases, whereas locally available, disaster-resilient and cost-efficient bamboo are underutilised (Zea Escamilla et al., 2016).

We discuss two case studies from the Philippines. The first comes from the municipality of Basey, in the province of Samar. Comprised of 51 *barangays* (villages) with a population of 55,480, Basey is prone to climate-related hazards such as typhoons and flooding (Cuaton & Su, 2020). We specifically consider the experiences of the *Mamanwas,* a displaced Indigenous cultural community in the municipality (Kahambing, 2018). Key informant interviews were conducted with community members and social workers to explore how the *Mamanwas* utilise their ILK in adapting to climate change. This study is led by GPC, a non-Indigenous Filipino scholar and resident of Samar who has worked extensively with the *Mamanwas* since 2013. The second case study interrogates the predominance of reinforced concrete as housing material used for building post-disaster houses across the country. Data is drawn from interviews conducted with representatives from a local non-government organisation (NGO) called 'Base Bahay' that employ alternative building materials in a number of typhoon-hit provinces of the country. The interviews explored the bamboo technology the NGO has developed, and the projects implemented in their partner communities. This study is led by PP, a Southern Tagalog region-born and raised Filipino scholar, who undertook fieldwork and explored the NGO's operations in Tacloban and Iloilo as part of his doctoral research project.

4. Absences and Adaptations: Detailing the knowledges both overlooked and emerging

In this section, we engage in two key analytical 'moments': one where we identify instances where institutions and groups have worked to silence, suppress, or render invisible locally based adaptation practices, and another where we articulate the diverse knowledges and practices the residents are already engaged in as part of their strategies in adapting to climate change. Drawing upon the DCAS framework discussed in Section 2, we identify at least two ways in which actors or institutions in our study sites have worked to omit ILK as well as the efforts in which communities are already engaged that push back against Eurocentric adaptation logics and approaches. It is important to note that while we discuss only two instances where ILKs are silenced and marginalised for each case study, there were actually many more in evidence.

4.1. Absences and adaptation strategies in Nawi Village, Fiji

Our first case study looks at how ILK, including climate adaptation practices, are integrated and amplified in the Fijian educational system as well as in the small villages like Nawi. Despite the vast amount of literature documenting the rich local knowledge and practices that Fijians have in coping with weather extremes (McNamara & Prasad, 2014; Piggott-McKellar et al., 2021), the schools and the national educational system in Fiji are not structured to recognise, support, and nourish these ILKs and adaptation initiatives. Talanoa sessions with the local teachers revealed that there is a privileging of Eurocentric worldviews in Fiji's education system which puts more emphasis on the teaching of math and science over ILK. This is consistent with the findings of other scholars like Verani-Norton (2021) and Cagivinaka (2016) who contend that traditional Fijian ILK are given little attention in existing higher education curriculum. Puamau (2021, p. 94) traces this to "the introduction of formal schooling when the church and colonial government saw Indigenous knowledge systems as primitive and unworthy for inclusion" and continue until today. We argue that this has flow-on effects into the way that Nawi residents view traditional adaptation strategies

and therefore find it unsurprising that ILK are rarely part of the school's learning programmes. One of the teachers we interviewed shared: *"we rarely teach traditional Fijian knowledge and practices to our students anymore. Not many schools do it because our focus is oriented to something else: to capacitate students with skills needed for employment in the global economy*" (personal interview, 20 November 2020).

This lack of consideration in teaching traditional Fijian ILK has adversely affected the understanding and beliefs of the youth. We observe that there is currently a lack of understanding and appreciation of ILK and adaptation strategies among them. For instance, an interviewee mentioned that *"only the elders believe in the traditional indicators for incoming cyclones that our ancestors previously relied upon such as the appearance of sea birds in the highlands or the building of nets by the wasps on lower tree branches*." (personal interview, 27 November 2020). Additionally, the head of the School of Humanities at the University of the South Pacific laments that the undervaluation of Fijian ILK has also resulted to "Pacific islanders being unable to use their own knowledge as a context of thinking… which has perpetuated the thinking that indigenous knowledge systems are not a worthwhile context for intellectual pursuits" (Puamau, 1999, p. 265). No wonder one of the teachers we interviewed remarked:

> "*It is ironic how our youths lack in-depth knowledge and survival skills in cases of climate catastrophes. Their parents and grandparents used to be able to predict when tropical cyclones would come with great accuracy, and they knew where to get food and supplies even if the first help was months away after any disaster*" (personal interview, 1 December 2020).

Aside from favouring Eurocentric worldviews in its education system, we also observe that officials in Nawi tend to promote market-based solutions in responding to climate change. After the village chief passed away, his siblings signed a contract with a logging company to create income and make way for the construction of modern houses in Nawi. These houses were purported to be resilient against strong winds and flooding. This housing modernisation project involved logging (to pay for these houses and for income), clearing of vegetation, and destruction of the mangroves along the riverbank. Moreover, heavy industrial machines were used to level the ground to make way for the construction of the modern houses which had massive impacts to the original landscape. The project emanates from a capitalistic standpoint privileging economic growth. Some of the Nawi villagers thought that getting more money through the exploitation of their tropical rainforest will build their climate resilience and improve overall well-being, moving from economies of direct provision to economies based on surplus extraction (Vunibola et al., 2022). Little did the residents know that the housing project will subsequently lead to disastrous impacts for them and their environment. Several residents of the modern houses have attested that they have become more vulnerable to climate hazards as the trees have fallen and the mangroves meant to protect them from king tides and floods were no longer around. Additionally, since the topsoil meant to support wild foods have been scraped off, people's access to climate-resilient crops like wild tropical yams have also dwindled. Worse, other residents have also complained that tropical cyclones have started to destroy some of their totem plants which are of high cultural and spiritual significance. This is a clear example of a privileging of capitalist productivity as some of the village leaders have agreed to extractive industries in the pursuit of short-lived financial benefits while living with the destruction that this caused.

Despite the production of absences as shown in the formal education system and the housing modernisation project, some of its residents, especially the elderly and village leaders, have been asserting and passing on their ILK to the younger generation. For example, Fiji's ILK on coping with climate change are documented and passed on to the next generation through *talanoa*, stories, chants, myths, games, and performing arts. In addition, a program called *'E da daravudravua e na del ani vutuniyau'* (We are poor while standing on riches) was implemented by one of the authors in 2017 as an initiative to 'heal' the land using the knowledge and skills of the Nawis' ancestors (Vunibola & Scheyvens, 2019).

The *'E da daravudravua e na del ani vutuniyau'* program has three component. First, a public awareness campaign was initiated to highlight the role that ILK plays in planning for disasters. Second, the process of 'healing the land' was conducted by the village elders to address the devastation brought about by logging (Appendix 1). Indigenous agricultural knowledge and techniques were used, such as invigorating topsoil by adding composted sea weeds and mangrove leaves, adding wood ash and burnt sea shells, and planting leguminous trees and grass. A food forest was subsequently created, including climate-resilient crops like wild yams, sweet potatoes, and *si'au* (a tree vegetable). Other domesticated crops, including cassava, yams, bananas, papayas, taro, and leafy vegetables, were also included, thriving within a multi-cropping environment that resembles their natural habitat. Third, mangroves were re-planted throughout the river through a children's game called *veiviri.* This refers to the well-known past time of throwing mangrove seed pods onto the mud. The outcome of these games, played by kids and adults alike, aims to protect the river front from erosion, and thereby reduce the impact of flooding and landslide. The residents hope that these initiatives will help revitalise their Indigenous livelihood systems, protect their ecosystems, and build their resilience to climate change.

4.2. Absences and adaptation strategies in Thai Binh, Vietnam

Our second case study explores the different state and community-led adaptation strategies in the context of farming in Thai Binh, Vietnam. We observe a privileging of modernist development interventions in climate adaptation strategies by the Vietnamese government. One example is the promotion of scientific toolkits and protocols for managing water irrigation systems that ignore the existing place-based knowledge and traditional, yet proven farming practices of local rice farmers. As climate change is expected to increase flooding, salt intrusion, and storm surges, good water management through proper control of sluice gates (a type of lock used to manage water flow and level, see Appendix 2) is increasingly becoming important for rice farmers growing in irrigated paddies (Mainuddin et al., 2021). In response, the local government has distributed decision-support tools meant to help residents manage the irrigation system (including sluice gates, pitches, pump station, and more). Local irrigation officers have been trained to use test kits or handy equipment to measure the constantly changing salt concentration of the river water before it gets into the local paddy fields and harms the young rice plants (if too saline). However, these toolkits do not have a user-friendly interface compared to the local irrigation practices that have been around for decades. Moreover, the introduced test kits are labour-intensive as they require officers to sink specific equipment for at least one minute in particular water layers (surface, middle, and bottom), then pull them up and record the numbers even at night. Irrigation officers consequently complained that these methods were confusing and difficult, and preferred to operate their sluice gates in traditional ways instead.

We also note that some adaptation interventions in Thai Binh are framed around linear and modernist temporality and understandings of progress. For instance, several government interventions have been conducted to 'accelerate' and 'modernise' the harvest of rice plants so that farmers gain an extra winter cash crop during extreme weather events. As a result, farmers are encouraged to shorten the interval needed to prepare and clean their land so that they can harvest earlier. This entails foregoing their traditional farming practices which involve packing soil for two to three weeks, taking time to observe unwanted changes in the growth of rice plants and in the rice fields, and being attentive to the needs of non-human entities (e.g., insects, river, soil) that affect rice growth. Instead, farmers are now being forced to prepare their land in under two weeks, even if the residues, insects, and pests

have not undergone natural composting. Consequently, this method can create inhabitable and poisonous conditions for the next round of rice plants, which are not vigorous enough to resist diseases. In 2017 this triggered an epidemic of Southern rice black-streaked dwarf virus, making Thai Binh farmers lose 70 % of their rice yield (Do & Dombroski, 2022). An interviewee complained:

> "*The earthworms, bacteria, and others are like us. They need time and appropriate conditions to do their jobs. The officials tried to blame the weather conditions for the development of this epidemic, but we don't think so… If our rice plants could grow well, they could perhaps better resist the virus*." (personal interview, 3 November 2017).

Amidst efforts to introduce modernist toolkits in managing water irrigation systems, several local farmers in Thai Binh have attempted to assert their local knowledges and adaptation practices in their own ways. A number of farmers have continued with their traditional practices that involved constant listening and communicating with the river, other non-human entities, and the sluice gates. For instance, in one of the conversations we had with a sluice controller in the *Quoc Tuan* commune of Thai Binh, he explained how he has been able to successfully control the sluice gates for over forty years and has no plans of letting go of this practice. By looking at the water's ebbs and flows based on the folk tide schedule, he has been able to make a near-accurate estimate of how long it would take for the salt water to reach his sluice gates. Additionally, netting specific varieties of shrimps or fishes at a particular spot in the river allows him to estimate how far away the salt water is from his hamlet. He can then set the time to appropriately open the sluice gate for getting fresh water and close it right before the saline water comes closer. This manual and traditional, yet time-tested method, ensures that there is enough fresh water for the local paddy fields in the dry season.

The local farmers also continue to follow decades-old ILK in planting and growing rice despite the local authorities' efforts to replace them with modern methods. Their farming processes involve using their ordinary senses and their embodied knowledges accumulated over the years. For instance, they can see changes in soil texture, structure, and fertility through their sense of touch, such as a hard setting soil as an indicator of poor soil quality. They can even assess the acidity of the rice fields by looking at their fingernails after handling the soil (e.g., yellow indicates high acidity). Farmers then respond accordingly by adjusting their actions such as manually increasing soil organic matters to decrease hardsetting in soil and draining out current water then irrigating fresh water to decrease acidity levels. Aside from adapting their actions to the things they observe from around them, farmers also explicitly signify the importance of non-humans through their persistence in practicing farming rituals such as the '*Lễ cúng cơm lúa mó'i*'. This custom involves farmers offering their first and fresh bowl of rice harvest to their ancestors and their gods to show their gratitude and mutual relationship with nature and other entities (Nguyen, 2011). By engaging attentively and bodily to the non-human worlds despite being labelled as superstitious, Thai Binh farmers are thus continuing on with their adaptation practices that are existing in their community for decades.

4.3. Absences and adaptation strategies in Basey, Philippines

Our third case study discusses the ways that the ILKs of the *Mamanwas* Indigenous peoples of Basey, Philippines have been marginalised and how these have nevertheless been retained, practiced, and passed on to the next generations. The *Mamanwas* as an Indigenous group claim to experience a silencing of their ILK when engaging with the non-Indigenous residents of the town. The *Mamanwas* consider themselves closely attached to their natural environment and sensitive to changes in their surroundings. They have developed weather monitoring systems that help them predict incoming storms, including Typhoon Haiyan, one of the most powerful typhoons to hit the Philippines in November 2013 which left 8,000 people dead or missing, and displaced at least four million residents (LeComte, 2014). One of the *Mamanwas* interviewed explained that two weeks prior to the arrival of Typhoon Haiyan, "*our elders were given an omen by our gods that a dangerous and potentially deadly event will occur*" (personal interview, 10 March 2019). This warning prompted them to build their *kurob*, a traditional hut that serves as protective shelter during typhoons. They also tried to warn other residents in the municipality about the impending typhoon, but they were only made fun of and ridiculed. The non-Indigenous residents claimed that they only believed what they heard it from the daily weather news report. This discriminatory experience heightened the *Mamanwas'* sense of distance towards other cultural groups in the area, and increased their perception that they are discriminated against because of their ILK. According to one of the *Mamanwas*:

> "*This unpleasant experience has prompted us to just focus on ourselves since sharing our ILK- which we value- is futile because most non-Indigenous residents just think of it as a joke*" (personal interview, 10 March 2019).

While the Mamanwas readily blame the behaviour of non-Indigenous residents of Basey, we argue that these general preference for scientific knowledge over ILK on climate disasters is one of the ways in which coloniality has seeped through and proliferated in the daily lives of many Filipinos.

Apart from a privileging of Eurocentric views that sidelines the *Mamanwas'* ILK, we also observe a strict formulation of linear time that associates the past as a discriminatory signifier of development delay within Basey. This is made evident by the rendering of *Mamanwas'* ILK and warning systems as backward and superstitious by the Disaster Risk Reduction and Management (DRRM) 'experts' and 'scientists' in both local (i.e., in Basey) and national government agencies (i.e. in Eastern Visayas). According to a disaster risk reduction officer, there have been multiple failed attempts in lobbying and integrating ILK in various local disaster risk reduction and climate change adaptation dialogues and consultative meetings. He claims that only the 'researchers' and 'experts' from the national government are often heard during the quarterly meetings of the Disaster Risk Reduction and Management Interagency Technical Working Group (DRRM IATWG) of Eastern Visayas. He attests that the technical working group privileges 'evidence-based' and 'scientific knowledge', labelling other forms of knowledge held by Indigenous people as 'unreliable' and 'old-school'. He aptly pointed this argument by saying that:

> "*it is as if Indigenous peoples' ILK in relation to DRRM and climate change are inferior or useless even though these knowledge systems have kept them safe from hazards for generations*" (personal interview, 27 June 2020).

However, despite the apparent underappreciation of alternative forms of knowledge, some community-led initiatives are present among the *Mamanwas*. These were born as reactions and a form of local resistance to the privileging of Eurocentric and modernist solutions often promoted in climate adaptation policies and programmes in Basey. We will focus on two of these here.

First is at the community level which focuses on the deliberate and active co-learning activities among elderly and young *Mamanwas*. According to their Chieftain, their Typhoon Haiyan experience and other hazards that followed it are the primary catalysts for prompting their community to share their knowledge actively. One elder said that: *"It's vital that we share our ILK to the young members of our community because hazards are becoming stronger and more frequent"* (personal interview, 10 March 2019). The community learning activities are done twice a month in their communal hut (Appendix 3). They gather the youth and children to share their traditional knowledge such as how to read the movements of the wind and interpret the noises of insects and movements of animals which may signal impending hazards. They also share their ILK such as

how to read the movements of the wind and interpret the noises of insects and movements of animals which may signal impending hazards. They also share their Indigenous practice of hazard-induced evacuation and weather forecasting. As a subsistence farming community, they also have an Indigenous calendar that they follow in terms of planting and harvesting rice and other crops (Cuaton & Su, 2020) which they actively teach to young *Mamanwa* farmers.

In this communal sharing of ILK, they also discuss the importance of their religious belief systems in interpreting catastrophic calamities. Banking on religious beliefs, *Mamanwas* consider catastrophic hazards as *Magbabadja*'s (a genderless God that controls the environment and people's fate) warning and punishment for humanity's multiple and unbearable sins, such as never-ending human conflicts and increasing environmental degradation, among others. These disastrous events, they believe, serve as reminders to repent for these sins and to live a better life that balances the use of natural resources for human's daily needs and the protection of the environment for human's continuous survival in the future. The elders shared that these lessons are integrated into their members' everyday lives through the "way they live"- for example, their peaceful and strong bonding ties (Cuaton & Su, 2023), and their practice of just taking or consuming enough so that others may also be able to live and survive (Cuaton & Su, 2020).

At the national level, social workers from the Department of Social Welfare and Development (DSWD) have devised ways to integrate *Mamanwas*' ILK into their programmes. For example, the Family Development Officer of DSWD has shared that their office has made efforts to document some of the *Mamanwas'* ILK particularly those involved in predicting local weather patterns. Additionally, following their experience from typhoon Haiyan, *Mamanwas* have been actively and consciously co-producing learning activities together with the other Indigenous groups of the Eastern Visayas region. These groups are involved in the co-creation of the 'Community and Family Development Module for Indigenous Peoples (IPs)' under the *Pantawid Pamilyang Pilipino Program* (4Ps) of the Philippine government. This module is written in local and Indigenous languages and consists of general and overlapping topics on human rights, Indigenous peoples' rights, children's rights and health, and children's protection in times of emergencies and hazards. The local social workers in Eastern Visayas have integrated some of the climate change-related traditional knowledges of Indigenous groups in this Learning Module.

4.4. Absences and adaptive strategies in Philippine Post-Disaster housing

Our fourth case study interrogates to what extent local and traditional materials like bamboo have been used in post-disaster housing projects in the Philippines. We observe that there is a widespread privileging of reinforced concrete for building typhoon-resilient houses across the Philippines (Venable et al., 2020). Modern concrete is considered a go-to construction material because it is seen as strong and durable, while plant-based materials are outright thought to be inferior because they are prone to deterioration from moisture and pest attacks (Mehta & Monteiro, 2006). For example, Venable et al. (2020) argue that many Filipino families from typhoon-affected provinces perceive that their shelter is safe from typhoons if they are built with concrete and less secure if they are made with wooden materials and other plant-based inputs like coconut lumber and woven bamboo. Yet evidence is increasingly supporting traditional construction as ideal because it makes the ethical negotiations around them visible and helps make Indigenous building skills and techniques become active and accessible for future generations to cultivate (Gibson-Graham et al., 2016).

Aside from privileging concrete, the Philippine post-disaster housing as a sector is marked by linear imperatives of temporality and progress. The Philippines has a long history of building houses with Indigenous plant-based materials (e.g., nipa, cogon, bamboo), but this practice had begun to change during colonial occupation (Lico, 2008). The Spanish colonisers saw plant-based materials as a fire hazard especially in dense urban areas and had to be separated from structures made from stone (Huetz de Lemps, 1998). The Spaniards then introduced the *bahay na bato* (stone house) architecture. Its lower floor was made with masonry stones to create a strong base against earthquakes and to address the concerns related to the flammability of light materials, while the upper floor enrolled timber and other plant-based inputs (Lico, 2008). These houses were mainly owned by Filipino elites while ordinary families live in traditional *bahay kubo* (Nipa Hut). During the American colonial years, modern building materials such as steel-reinforced concrete became in fashion. Government buildings, schools, and commercial spaces were built using concrete, materialising a kind of American modernity based on the US benevolent assimilation policy (Lico, 2008). Up until today, Jimenez and Natividad (2019, p. 21) contend that bamboo is only widely used in rural agricultural areas and are commonly considered as a 'poor man's timber'.

The priority given to concrete over light materials such as bamboo contributes to a host of environmental concerns related to its heavy embodied energy and highly extractive nature of production. Cement production uses as much as 9 % of global industrial energy (Richards & Agranovski, 2015) and emits from about 5 % to 7 % of global carbon emissions (Li et al., 2013). Concrete also requires the mining of other mineral inputs (e.g., silica, iron, alumina, gypsum, and lime for cement manufacturing; aggregate such as sand and gravel to strengthen concrete and provide volume stability; and iron ore and coal for manufacturing steel reinforcement) (Mindess et al., 2003). The unsustainable intensification and expansion of quarries also contribute to the decline of arable lands and forested areas, losing their potential of functioning as a carbon sink (Akanwa et al., 2017). Concrete is reinforced with steel to make it stronger, but this process does not make it immune to damage. Without proper repair and maintenance, steel reinforcement is prone to corrosion and the build-up of rust and iron oxide in the material can contribute to concrete cracking (Mehta & Monteiro, 2006). The production of concrete is also implicated in precarious and often illegal artisanal and small-scale mining of construction stones (Placino & Gibson, 2022). We assert that a climate-adaptive building design must not only consider the material inputs and structure of a building, but also the broader economic and ecological connections they make along the upstream and downstream supply chain, thus putting front-and-centre the socio-technical dimensions of climate-adaptive construction designs.

To help push back against the domination of concrete in disaster-resilient housing, an NGO called *Base Bahay* has begun redefining opportunities from bamboo's material properties and mainstreaming its benefits. Through the Base Innovation Center, local builders, some of which are actual recipients of their housing project, were trained in building with bamboo (i.e., *Bambusa Blumeana* [*kawayang tinik*] and *Dentrocalamus Asper* [*botong or giant bamboo*]) as structural frames for walls and roof (Ong, 2021). In the process, bamboo's good quality tensile strength becomes highlighted as comparable to wood and steel (Hebel et al., 2015). In particular, Base Bahay has engineered their bamboo frames to provide flexibility and strength against typhoon winds of about 220 km per hour and 6.4 magnitude earthquake (Base Bahay, n.d.). The bamboo frames are encased in a metallic mesh and covered with thin layer of cement plaster to help protect them from the rain. They are also elevated from the ground using a concrete foundation to prevent flood and soil moisture seeping in. As of 2016, 226 units (52 in Metro Manila, 94 in Iloilo, 77 in Tacloban, and 3 test houses in Albay) for at least 147 families had been built by the organisation (Hilti Foundation, n.d.). Base Bahay also ensures that their local partners have been consulted about the design of the cement-bamboo frame housing so that the latter is made capable to undertake repair and maintenance of their houses in the long-term (Base Bahay, n.d.). This socio-technical intervention and other similar building innovations have helped push the building governance in the Philippines to become responsive in accrediting them as an alternative to mainstream house building system and in promoting the viability and adoption of these new technologies

for future low-cost housing projects (National Housing Authority, 2021).

Lastly, Base Bahay helps combat the progressivist mode of futurity in Philippine post-disaster housing by making bamboo more relevant to the needs of contemporary Filipino households. They help ensure that the cultivation of bamboo does not only contribute to the building industry but also become responsive to the livelihoods of both humans and Earth others. They emphasise the opportunities for the local economy of bamboo, being abundant and fast growing in tropical countries like the Philippines (Roxas, 2012). The use of bamboo helps in lessening the amount of imported steel to be used in buildings, thus lowering the cost from such an expensive material (Hebel et al., 2015). The bamboo stems (culms) enrolled in building Base Bahay projects are planted by farming communities in Batangas and Negros Occidental. Bamboo cultivation in these areas create additional livelihoods and therefore source of income for workers, such as those who dry and treat/process the bamboo culms to avoid insect infestation and moulding. In addition, bamboo forests serve as a carbon sink, help mitigate soil erosion, and provide a habitat for different species (Yuen et al., 2017). In this example, bamboo innovations, such as the way it was utilised by Base Bahay, act as versatile building material that decentres a singularity of steel-reinforced concrete construction in local Philippines housing industry. Lastly, bamboo also acts as a generator of diverse livelihoods for both humans and Earth others as an approach for building sustainably and equitably in a climate-changing world.

5. Discussion and conclusion

This paper engages in a reframing of climate change adaptation, drawing on the lived experiences of our case study communities in Fiji, Vietnam, and the Philippines. It seeks to contribute to DCAS, an "ongoing ethical and political project that seeks to analyse and rethink the world from the perspective of Indigenous and other colonised peoples" (Johnson et al., 2021, p. 4). The paper involves two key analytical 'moments': one where it identifies instances where institutions and groups have worked to silence, suppress, or render invisible locally based adaptation practices, and another where it articulates diverse knowledges and practices the residents are already engaged in to adapt to climate change. In doing so, we attempt to respond to Tuck and Yang's (2012) call to move beyond the metaphorical use of the term 'decolonisation' by foregrounding the many place-based approaches that are often overlooked and downplayed within mainstream climate adaptation scholarship.

Our four case studies highlight how ILK and relationships with other species and ecosystems tend to be overlooked and suppressed in adaptation policy and practice. We see three different *monocultures* or processes that contribute to this omission: (1) privileging mainstream and scientific ways of knowing, (2) linear and progressivist timelines that associate the future with progress, and (3) pursuit of growth and market driven responses to climate change. We provide a summary of the different types of silencing encountered across our case studies that contribute to the marginalisation of ontologies and epistemologies of the Global South (Table 1).

We observe a theme running through the four case studies based on *concrete,* not only as an infrastructure but also as a metaphor for the rigidity and fixity of mainstream approaches to adaptation that depend on Eurocentric knowledge systems alone. We not only see the proliferation of concrete-based infrastructure such as those in the modern houses in Fiji or in the post-disaster houses in the Philippines; we also see a preference given to concrete knowing such as the promotion of scientific toolkits for managing irrigation systems in Thai Binh and for making weather predictions for the non-Indigenous neighbours of the Mamanwas in Samar. We argue that adaptation strategies that mainly rely on Eurocentric and modernist rationalities tend to favour concrete infrastructures and concrete forms of knowing, and that these do not work well with the current uncertainties of future climate change impacts.

Such pre-occupation with concrete leads to the suppression of ILK and adaptation strategies, which in turn, results to increased vulnerabilities and marginalisation of our case study communities. For instance, the building of modern houses to flood-proof Nawi village in Fiji has resulted to more flooding and the eventual destruction of totem plants that have high cultural and spiritual significance. In Thai Binh, local authorities' efforts to promote aggressive farming techniques eventually led to an increase in the incidence of plant disease and a decrease in farmers' yield. In Basey, the *Mamanwas* are looked down upon and disrespected for their traditional beliefs, resulting to their disenfranchisement, and perception of being left out of the wider community. These lived experiences suggest that some of the adaptation-related and development-oriented interventions meant to assist local communities are, in fact, creating new or exacerbating their pre-existing vulnerabilities to climate and hazard risks.

However, in this research, we go beyond framing our case study communities as helpless victims of climate risks. Our case studies illustrate Indigenous and local people's agency — that there are diverse ways in which they understand, manage, and respond to climate change. We find that communities are attempting to shape policy and planning responses to climate change. For instance, Thai Binh farmers continue to follow decades-old ILK in planting and growing rice despite attempts of local authorities to introduce modern farming techniques. Similarly, Base Bahay is working to revolutionise housing construction in the Philippines by actively promoting the benefits of using bamboo as a mainstream construction material. Its efforts are starting to bear fruit as bamboo has recently been accredited by the national government as one of the reliable and sustainable building materials in the country. These examples contest existing framings of vulnerability in the literature and instead assert people's resilience and adaptive capacities that draw upon ILK, practices, and materials (Makondo & Thomas, 2018; Nursey-Bray et al., 2020).

In addition, our findings challenge popular discourses that dismiss traditional and Indigenous forms of adaptation as backward and ineffective (Smith, 2007). We stress that people's ILK are actually assets that assist them in better adapting to climate change. For example, the

Table 1
Summary of the absences experienced and the adaptation initiatives of local communities across the four case study sites.

Case Study	Types of Absences		Emergences
1: Nawi Village, Fiji	Undervaluation of ILK and adaptation strategies in the formal education system	Prioritisation of growth oriented and market driven solutions	Passing on local knowledge through various mediums (*talanoa,* chants, stories, etc.); 'Healing the Land'; Re-planting trees and mangroves
2: Thai Binh, Vietnam	Promotion of scientific toolkits for managing water irrigation systems	Regarding traditional farming practices as underdeveloped and backward	Asserting traditional water irrigation practices; Being sensitive and attentive to non-humans and other entities; Continuing the practice of cultural rituals
3: Basey, Philippines	Privileging scientific and evidence-based ways of knowing	Rendering ILK as superstitious and unreliable	Inter-generational community learning activities; Sharing of traditional ecological knowledges; Integration of Indigenous perspectives into local government programmes
4: Post-Disaster Housing, Philippines	Preference for concrete in post-disaster housing	Seeing traditional housing materials, such as bamboo, as inferior and of lower quality	Promotion and incorporation of bamboo in Base Bahay's housing projects; Advocating for the accreditation of bamboo in government housing projects; Innovating construction applications of bamboo

traditional weather monitoring system of the *Mamanwas* in Basey helped them prepare for typhoon Haiyan weeks before it hit their community. Moreover, Indigenous agricultural knowledge and techniques among the residents of Nawi did not only heal their land from the adverse effects of logging, but they also helped cultivate and grow climate resilient crops. These empirical examples and lived experiences of our case study communities support the marginal, yet critical and vital body of scholarly works that assert the value of ILK, and ways they help societies adapt and thrive in a wide range of environmental risks and hazards (Ford et al., 2020; McNamara & Prasad, 2014).

Finally, our empirical findings highlight that there is more to climate change adaptation apart from its technocratic, concrete-oriented, and 'science'-dominated framings. In this paper, we show that effective adaptation strategies can also emanate from unexpected and peculiar, yet 'working' practices, such as being attentive and responsive to other species and ecological processes (as shown in Thai Binh, Vietnam), or through a children's game of throwing mangrove seed pods into the river (as shown in Nawi, Fiji), or by living simply as inculcated by the Mamanwa elders to their children (as shown in Basey, Philippines). We stress that a decolonial approach to climate adaptation moves away from needing concrete(ness) to listening and adapting with awareness and openness to other forms of knowing and being (Cameron et al., 2014; Hill, 2014). Like Lopes et al. (2018), we contend that there is a need to focus less on hard infrastructures or modernist developmentalism and to hone in more on inventorying and building on the diverse range of adaptation strategies that already exist within communities.

In summary, there is much to learn from traditional and Indigenous approaches to climate change adaptation in the Global South particularly in terms of adaptive practices, materials, and dispositions that resist the concrete – both literally and metaphorically. We identify three lessons that our case studies offer for the adaptation industry. First is the need to recognise that the legacies of imperial violence from colonial eras live on (Sultana, 2022) and that promoting recovery and healing from on-going systemic injustices is critical. Second is the need to highlight the important role that ILK play in facilitating peoples' adaptive capacities to climate change. More effective adaptation plans and policies can be generated from diverse epistemologies, ontologies, and approaches (Goldman et al., 2018). Third is the need to go beyond technical fixes that limit our imagination and narrow potential adaptation responses (Nightingale et al., 2020). A greater exploration of diverse pathways to adaptation that create openings for alternative possibilities is urgently needed. Moving forward, we believe that there ought to be a place for learning from such traditional and Indigenous knowledges and practices to guide climate change adaptations, not just in these communities but more broadly.

CRediT authorship contribution statement

Justin See: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing. **Ginbert Permejo Cuaton:** Formal analysis, Methodology, Validation, Writing – original draft, Writing – review & editing. **Pryor Placino:** Formal analysis, Methodology, Validation, Writing – original draft, Writing – review & editing. **Suliasi Vunibola:** Formal analysis, Investigation, Methodology, Validation, Writing – original draft, Writing – review & editing. **Huong Do Thi:** Formal analysis, Investigation, Validation, Writing – original draft, Writing – review & editing. **Kelly Dombroski:** Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing. **Katharine McKinnon:** Conceptualization, Formal analysis, Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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Appendices

Appendix 1: A photo taken of 'Healing the Land' programme showing *tei veicurumaki* (multicropping farming technique) in Nawi, Fiji

Source: SV.

Appendix 2: Some of the sluice gates in Thai Binh, Vietnam

Source: HTD.

Appendix 3: A communal hut of the Mamanwas in Basey, Philippines

Source: GPC.

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