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**FROM CAUSALITY TO BLAME:
Exploring flooding, factories and land conversion in Eastern Thailand**

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It has become common to attribute the growing frequency and severity of floods to climate change. But the factors behind flooding are many, and climate change often disappears from the equation at the local level. This study draws on interviews with key informants and community members and focus group discussions to explore the increasing incidence of flooding in two sub-districts in Eastern Thailand. To our surprise, there was little sense of community anger: flood risk had increased; the causes rooted in maladaptation linked to land conversion were recognized and uncontested; and injustice was palpable. But anger and resistance were muted. The paper seeks to make sense of this situation. Villagers accepted their complicity in creating the conditions for heightened flood risk through their willingness to sell their land for conversion. The disconnection between the identification of causality and the allocation of blame raises questions about how notions of environmental justice play out in places like Ban Thapma and Ban Nhongllok, where justice and injustice do not fall equally across space and society.

Keywords: flooding, land conversion, politics, maladaptation, justice, Eastern Thailand

Development, environmental change and (flood) justice

Climate change is manifested in weather extremes and climate hazards such as floods, droughts, heatwaves and fire weather, and these hazards disproportionately affect more vulnerable groups. This is now well established in the science (IPCC 2023) and increasingly accepted by the public, politicians and policymakers. While climate adaptation strategies may need to be transformational in nature to address climate hazards in a way that can be more holistic, equitable and inclusive, the Intergovernmental Panel on Climate Change (hereafter IPCC) laments in their Synthesis Report that “[m]ost observed adaptation is fragmented, small in scale, incremental, sector-specific, and focused more on planning rather than implementation” (ibid.: 61). Reflecting on the uneven distribution, socially and geographically, of the impacts of climate hazards, the IPCC (ibid.: 101) calls for “[a]ctions that prioritise equity, climate justice, social justice and inclusion”, which would “lead to more sustainable outcomes, co-benefits, reduce trade-offs, support transformative change and advance climate resilient development”.

Human geographers and political ecologists have been at the forefront of scholarship examining these intersections between global environmental change and matters of equity, justice and inclusion (e.g., Nightingale 2017 and 2018, Nightingale et al. 2020, Ribot 2011 and 2022). Such work “explicitly queries *adaptation for whom, by whom and at what cost*” (Henrique & Tschakert 2020: 1170 [emphases in original]). More particularly, and with respect to this paper, such scholarship is also often underpinned by a further question: why do actions and practices that transparently fail the justice test persist?

Questions of justice – and demands *for* justice – have become increasingly prominent globally, evident at each successive meeting of the Conference of the Parties (COP). The same is true of scholarship, where the overlapping topics of environmental justice, climate justice and disaster justice have elicited growing attention and interest.¹ What is meant by justice is, however, contested, and it may be that a singular definition will never satisfactorily capture the different conditions found across contexts where justice matters pertain (Lukasiewicz 2020: 8). That said, for the IPCC:

“Justice...links development and human rights to achieve a human-centred approach to addressing climate change, safeguarding the rights of the most vulnerable people and sharing the burdens and benefits of climate change and its impacts equitably and fairly” (IPCC 2022)

Such a carefully considered and calibrated balancing of justice, development, rights, equity, burdens and benefits may offer an expansive definition, but as we will argue in this paper, its application to situations of injustice is another matter (see Liao et al. 2019). On the one hand, it is evident that injustices continue to proliferate, but equally, the separation of justice from injustice may not be altogether clear. In other words, we may not know injustice when we see it. The most socially excluded are not always the most exposed; exclusionary contours do not map neatly on to environmental effects; the voices of the marginalized are not heard; and justice and injustice are intersectional, unequally meted out within families, households and communities.

Floods – the main climate event examined in this paper - are complex hydro-social events with sometimes counterintuitive effects (Collins and Grineski 2022), where interventions

¹ For relevant collections, see: Holifield et al. 2018 (on environmental justice); Lukasiewicz and Baldwin 2020 (on disaster justice); and Bhavnani et al. 2019 (on climate justice). One handbook on environmental justice, with 51 chapters was said to present only “a snapshot of the field at one particular point in time” (Holifield et al. 2018: 2).

sometimes result in ‘perverse’ outcomes (Henrique and Tschakert 2019). Studies of floods note that excluded and marginalized communities’ voices are rarely heard (e.g., Parthasarathy 2018, Carmichael 2020), their knowledge and expertise go unappreciated (e.g., Henrique and Tschakert 2019), and their concerns are routinely discounted or ignored. For many scholars and practitioners, the fact that floods have unequal effects is unremarkable; it is rooted in histories of marginalization and deeply etched into society.

As such, not only are floods complicated, but so too is society. With this in mind, when natural scientists ‘go’ social and look to bring society within the methodological and interpretative net of established approaches, they will necessarily fail to capture the plurality of ‘society’ (Castree 2015). Equally, when social scientists engage with the physical sciences, there is the tendency to treat “the environment as either an inert platform upon which social processes unfold or as merely a set of representations about the world rather than as a material reality” (Biermann et al. 2018: 561).

The flooding case that this paper recounts is unusual and presents an interesting learning opportunity. In the literature, community action and agitation against developments, whether private or public, that increase flood exposure and risk and other environmental harms are well documented (see, for example, Padawangi and Douglass 2015), even across borders (e.g., Marks and Zhang 2018). Informed in part by such literature, we expected to find something similar in our field sites in Eastern Thailand. It is, in many respects, an exemplary case of maladaptation. But as will become evident as we dig into these issues, a puzzle emerged: there was a broad consensus among residents in our study sites as to the causalities of flooding in the area and the maladaptations that were the root causes of such flooding. At the same time, however, there was little sense of community anger at the growing level of flood exposure that villagers were facing. Flood risk had increased; the causes were recognized and uncontested; and injustice was palpable, at least to us as researchers. But resistance was muted and ‘blame’ largely unarticulated. In such a geographical context, how do we make sense of this situation, and where do we locate environmental justice?

Thailand: land of rice, water – and floods

Thais have long lived with floods. The signature crop of the country – wet rice – is dependent on the seasonal inundation of paddy fields, and floods are, in a real sense, necessary for life. While flooding may be regarded as a ‘fact of life’ and, therefore, a ‘natural’ event in a

monsoonal country like Thailand, it is becoming more disruptive and costly as the economy and modes of living change. The 2011 floods were the most serious since 1995 and, on some measures, the most serious in Thailand's history, notwithstanding the fact that other floods have been of higher magnitude and more extensive (Gale and Saunders 2013). The 2011 floods led to over 800 fatalities, inundated almost 100,000 km², affected more than 13 million people, and incurred a total estimated cost of US\$45 billion (Marks 2015). The unprecedented price tag attached to the 2011 floods is because the countryside is no longer just a farming frontier: it is home to industrial parks and many scores of factories. It led to a sharp fall in the value of Thailand's exports, even interruption to the global supply chains in the run-up to the Christmas season (Chongvilaivan 2012). Historically, the key livelihood activity of Thais – wet rice cultivation – was adapted, indeed depended, on flooding. As Bangkok has expanded, however, satellite towns and cities have grown, and industrial parks and housing estates increasingly pepper formerly agricultural areas, so this coexistence has broken down, reflected in the effects of the 2011 floods. No longer is flooding an essential component in most livelihoods; increasingly, it is essential for only a few, and a threat to many more.

Floods have a mix of natural and human causalities and, when sufficiently severe, become compound disasters. Into this blend of the natural and the human can be added the effects of anthropogenic climate change. Floods in Thailand and elsewhere, therefore, have three broad sources or causalities, and these will vary in their relative contributions between locations and events. There are causalities that:

- Have their origins in natural climatic activity such as the Indian Ocean dipole or the El Niño–Southern Oscillation (ENSO), leading to extreme weather events, most obviously heavy rainfall;
- are linked to issues of water management (e.g., the timing of the release of water from reservoirs) and land management (e.g., land conversion) decisions; and/or
- are associated with anthropogenic climate change.

'Attributional' analyses attempt, through modelling, to identify the balance between these three elements in particular flood events. With regard to Thailand's 2011 floods, for instance, Promchote et al. (2016) conclude that "anthropogenic GHG [Greenhouse Gases] played an important role in producing the sustained increase of pre-monsoon rainfall over the CPRB

[Chao Phraya River Basin]” (Promchote et al. 2016, 376-377) and, further, that “the potential for flooding events similar in intensity to that of 2011 will increase” due to anthropogenic climate change. In this paper, we take attributional analysis to the local level, to two villages in Rayong province on Thailand’s Eastern Seaboard, to explore how floods and flooding are perceived by affected residents. Where do local residents see the causalities of floods lying? Who do they ‘blame’? And how do they respond in adaptational terms and also politically? Do they agitate against the perceived perpetrators of the floods that have caused such damage and the injustices of the environmental violence (Nixon 2011)?

We ask these questions in this manner for two reasons. First, we are interested in understanding how – and whether – so-styled global climate change discourses have worked through to ‘ordinary’ people in a semi-rural area of a middle-income country. Does the climate change debate have a local explanatory purchase that mirrors its scientific attributional signature? Second, and more significantly, we are interested in considering whether flooding has made the transition from being viewed locally as a natural phenomenon over which both residents and government have little control, to one where identified groups, agencies, and even countries are seen to be the culprits. In making this transition, flooding makes a parallel transition from a matter of ‘karma’ to one of ‘justice’.

The study sites in land use and development context

The study sites are two villages in Rayong province in the Eastern region of Thailand, Moo 4 Ban Thapma, Thapma sub-district, Muang Rayong district; and Moo 3 Ban Nhonglalo, Nhonglalo sub-district, Ban Khai district (see Figure 1). The criteria for selecting these settlements were their location, the level of land conversion in the area, and flood experiences. Both villages, situated in the Rayong River basin, have experienced several flood events. Ban Thapma is located in the lower river basin and, due to its location, has experienced more severe floods than Ban Nhonglalo. Ban Thapma was more urbanized, and its economy more diversified; the area surrounding Ban Nhonglalo was rather more rural, and its economy more agricultural. Ban Nhonglalo’s rural complexion is under threat, however. The village and surrounding lands have undergone significant modification with government development projects (see below). Accordingly, the two villages, one with historically significant land developments and the other with emerging issues but both afflicted by increased flooding, were selected as pilot study sites to investigate how affected residents perceived floods and how they dealt with floods.

[FIGURE 1 ABOUT HERE]

The changes to this area, most visibly associated with extensive land conversion and development in the Eastern provinces of Thailand, have been driven by the Eastern Seaboard Economic Region Development Programme (ESDP) instituted in 1982 with the aim of decentralizing industrial and economic activities away from Bangkok. Consequently, industrial estates mushroomed around the region (Eastern Economic Corridor 2019). More recently, in 2018, the Eastern Economic Corridor (EEC) programme was established to further encourage and support developments in this region (Eastern Economic Corridor 2019). Rayong province, as a part of the Eastern region, has been highly affected by these programmes and the land conversion projects of which they are a part. The western and southern parts of Rayong province are identified as sites for urban and industrial expansion and development, encompassing our study sites of Ban Thapma and Ban Nhonglaloek.²

In line with the plans of both the ESDP and EEC, Rayong Province has become a transportation hub and industrial centre, attracting migrants from other regions of Thailand and neighboring countries (Department of Public Works and Town and Country Planning 2019). Reflecting land developments in Rayong province as a whole, land use in Thapma and Nhonglaloek has also significantly changed (see Figures 2 and 3). In Thapma, the proportion of land defined as urban and built-up increased from 43% to 66% between 2007 and 2017. Agricultural land uses declined, from 30% to 26%.³ Nhonglaloek, while part of the area designated for development in the land use plan, is situated in a less accessible location than Thapma and still maintains a predominantly rural character. Nonetheless, a similar development trend is evident. Between 2007 and 2017, the share of urban and built-up land in Nhonglaloek increased from 17% to 29%, which was attributed mainly to the expansion of industrial estates. Agricultural land uses – consisting of perennial crops, orchards, paddy fields and field crops – decreased from 76% to 68% over this ten-year period.⁴ Furthermore, it is evident from the EEC Plan that industrial and urban land uses will continue to expand in Rayong, spilling over into the Nhonglaloek area.

[FIGURES 2 and 3 ABOUT HERE]

² The northern and eastern parts of Rayong province are designated as rural areas for agricultural land uses.

³ Agricultural land uses include perennial crops, orchards, paddy fields and field crops.

⁴ The analysis by the authors was based on data from the Department of Public Works and Town & Country Planning, using the GIS.

Methods

The aims of this research were to explore how residents affected by floods perceived floods and flooding and how they responded in both adaptational and political terms. To address these aims, qualitative methods were adopted.⁵ In-depth interviews and focus group discussions were used to collect data from the chosen study areas, the two villages of Ban Thapma and Ban Nhonglalok. Both villages were, until quite recently, rural settlements reliant on agricultural activities but have been drawn into the region's thoroughgoing economic, land use and livelihood transitions. The transition path of each settlement is necessarily different, thus offering an opportunity for comparison.

Data collection

In-depth interviews and focus group discussions were undertaken in May and August 2022. Research participants comprised two main groups: key informants (local leaders and government officers) and local respondents (long-term residents and newcomers). For key informants, we used purposive sampling, selecting participants based on their position or role and their knowledge of the community context and/or flooding and flood management. They included village heads or *phu yai ban*, the sub-district municipality mayor, Regional Irrigation officers, and Disaster Prevention and Mitigation officers.

Focus groups was employed to collect information from government officers and local villagers. While we recognized the risks of bringing together participants with different backgrounds and positions, we believed this was counterbalanced by the opportunity to encourage open discussion through careful moderation. For local leaders, including village heads and the sub-district municipality mayor, and for some villagers, we conducted in-depth interviews with a view to recording their individual views.

In selecting local respondents, we were intent on sampling two sub-groups: newcomers who had lived in their community for five years or less, and community members who had lived there since birth. We utilized a mix of snowballing and convenience sampling. Initially, local respondents affected by recent floods from both sub-groups were identified and introduced through community leaders. To broaden our respondent base, we also conducted door-to-door

⁵ Although the wider project of which it is a part also has a natural science and modelling element.

interviews with both categories of villagers based on their availability and willingness to participate. In total, 34 research participants contributed to the research (Table 1).⁶

[TABLE 1 ABOUT HERE]

In-depth interviews and focus group questions

A core questions framework (see Figure 4) was developed for the in-depth interviews, adapted from USAID (2012), Scoones (1998), DFID (2015), and Magnuszewski et al. (2019). Using this framework, we created two sets of questions. Question Set A was for key informants and consisted of eight questions, which probed community assets, flooding management, flooding effects, and flooding policies. Question Set B was for locals residents (both long-term villagers and newcomers), and consisted of nine questions. These questions were divided into three main ideas: 1) Experience and perception regarding floods; 2) Flood management and adaptation; and 3) Expectations and actions of affected residents (see Figure 5). Both sets of questions informed our thematic analysis related to community assets, the causes of floods, and community resilience. All interviews and focus group sessions were electronically recorded, transcribed, and translated from Thai into English.

(FIGURE 4 ABOUT HERE)

(FIGURE 5 ABOUT HERE)

Data analysis

To analyze the qualitative data, we employed thematic framework analysis as outlined by Labra et al. (2019). Through the close reading of the transcribed primary data, 12 distinct themes emerged: 1) Nature, impact and severity of floods; 2) Livelihood activities; 3) Causes of floods; 4) Land development; 5) Advance warning; 6) Planning and training; 7) Community cooperation; 8) Social media and communication; 9) External assistance and mitigation; 10) Generation issues; 11) Compensation; and 12) Adaptation. The primary interview data were complemented with our documented fieldnotes and other secondary data sourced from news outlets and government databases concerning flood events and government development

⁶ The research received ethics approval from the Institutional Review Board of Chulalongkorn University (COA No. 098/65 and date of approval 20 April 2022). All respondents, including key informants and community members could decline from being interviewed or withdraw from participation at any time. We also asked for their consent to be recorded.

projects. This dual-sourced approach aimed to bolster the reliability of data gathered from local perspectives by integrating insights from government/public sources.

THE FLOOD CONTEXT: Merging secondary data with local experiences.

The progressive development of Thailand's Eastern region since the ESDP was introduced in the early 1980s has transformed the land market in those areas earmarked for development. Land prices have increased, tempting local residents – like those in Ban Thapma and Ban Nhonglalok – to sell their land for industrial, housing and infrastructural investment and development (Eastern Economic Corridor 2019). This region of Thailand is not just a zone within easy reach of Bangkok and ripe for development. Physically, it consists of multiple short mountain ranges, separating the region from the neighboring Northeastern region and Cambodia, creating a series of small river basins with short rivers that flow into the Gulf of Thailand. This combination of land transformation and a fragmented topography has created the conditions for growing flood hazard and heightened flood risk. Ban Thapma is low-lying and prone to flooding, making it especially exposed to the consequences of land conversion and development. Ban Nhonglalok, is situated on higher ground and is less susceptible to flooding. The inhabitants of both settlements, however, were conscious of the growing flood risk in the area.

Since 2010, the Thapma sub-district has been flooded numerous times, with major flood events in 2012, 2013, 2015, 2017, 2020 and 2022.⁷ The most recent flood event occurred in September 2022, caused by heavy rainfall resulting in flash floods. Flood waters were reported to have risen between one and three metres in the Thapma sub-district as well as in other sub-districts (Thairath Online 2022), forcing the closure of several schools and affecting local businesses and 25,123 households. Figures 5 and 6, photographs taken by the village head of Ban Thapma, show the disruption caused during the 2020 flood. While Nhonglalok sub-district has been flooded less frequently than Thapma sub-district, major floods took place in this sub-district in 2011, 2013 and 2020.⁸

⁷ For media reports on these flood events see: Thai PBS News 2012; Daily News 2013; Thai PBS News 2013; Bangkok Business News 2015; Thairath Online 2015; Thai PBS News 2017; Naewna News 2020; MGR Online 2020; Kom Chad Luek Online 2020; The Nation Thailand 2022; and ReliefWeb 2022.

⁸ For media reports on these flood events see: MGR Online 2011; MGR Online 2013; Bangkok Business News 2013; Khom Chad Luek Online 2020; Siamrath 2020.

(FIGURES 6 and 7 ABOUT HERE)

Serious flood events have not always been features of life in Ban Thapma, our interviewees reported. One respondent (RI#2)⁹ said that the first flood she experienced occurred in 2011; the mayor of Thapma (KI#3) told us that flooding started to become a problem around 2007, while a participant in one of the focus group discussions (FGD#3) put the beginning of the flood era to be around 2002. While villagers timed the onset of the flood era slightly differently, all agreed that from being events that few could remember before the turn of the Millennium, by the time of our research, they were occurring, the head of Ban Thapma (KI#1) said, as often as three times a year. Moreover, “now the flooding is on another level of severity [compared to earlier times]”, a participant in one of our focus group discussions (FGD#2) said. In 2015, there were three separate flood events, and some 8,000-9,000 households were affected (KI#3).

The onset of a flood event can be very rapid indeed. A participant in one of the focus group discussions (FGD#5) in Ban Thapma said: “Last year [2021], the flood came within five minutes. It only rained that day at midnight, and ten minutes later the water rose [to knee height]”. Because the flood waters arrived so quickly, and at night, few residents were able to lift their belongings above ground level for safekeeping. In this instance, the waters did not recede for a week.

Thankfully, fatalities have been rare; an official (KI#2) from the provincial office of the Department for Disaster Prevention and Mitigation (DDPM)¹⁰ said that during the period he had been working in the area, only two people had died in floods, “both foreign workers”, he added. To refer to these two foreign workers, the official used the Thai term *raeng ngaan tang dao* (แรงงานต่างด้าว). This implies they were workers from neighboring countries (Cambodia, Laos and Myanmar) rather than further afield. The term also has derogatory connotations, and it was significant that the official then felt obliged to explain:

“Thai people are safe, but [foreign] workers in the agricultural sector who come to tap rubber and collect fruit are [still] not [safe]... [It is hard to educate them] because of the language barrier and because they’re working hard all the time. Our mission is to raise awareness...

⁹ Interviewees are indicated as follows: KI = Key Informant; RI = Respondent Interview; and FGD = Focus Group Discussion.

¹⁰ The DDPM under the Ministry of the Interior has been tasked with managing floods (and other disasters) in Thailand since 2002.

The deaths of foreigners are also considered a loss because they are also human beings. But for budgetary and manpower reasons, we couldn't organise training [for them]." (KI#2)

Even for Thai people who are considered safe, floods are traumatic. Crops are destroyed, livestock and pets washed away and drowned, houses inundated with polluted water, and belongings damaged and lost. Auntie Khieo (RI#1) was in her late 50s when we interviewed her, and she was suffering from heart disease and sclerosis and burdened by the additional responsibility of caring for her blind husband. For Aunt Khieo, the recent floods were not something that could be smoothly 'managed' and easily discounted:

"I lost all my property, [including] my bed, cooking utensils, food, rice, and no one came to help. ... I had no bed to sleep [on]. ... I cried over and over because I had nothing to eat at that time. ... [I am] very worried [about flooding]. I once sat down and hugged my husband with tears, thinking about what to do, what to eat. No one brought anything to eat except my grandson." (RI#1)

It was clear that floods have become, over the last two decades, an increasing – and increasingly severe – problem for the inhabitants of our two study sites and, more widely, for residents of the Eastern Seaboard provinces in Thailand. Several issues arise from this simple and largely uncontested observation. The two addressed in the next section are: how is 'blame' (or causality) identified and apportioned? And, how do villagers agitate or resist in response to this identification of blame?

FROM IDENTIFICATION TO BLAME

Identifying causality: local views of the sources of flooding

Just as our respondents were clear about the increasing incidence and severity of flooding, they were also clear in their attribution of the causes of flooding in the area: land conversion and associated land development. There were no competing explanations; notably, not one respondent explicitly mentioned climate change to explain the growing incidence of extreme weather events that have become part of the national narrative. Indeed, there was only a single resident – of Ban Thapma – who attributed flooding to extreme weather. She mentioned a cyclone of an intensity she had not experienced before (FGD#5). But even she did not directly link this to climate change:

“The storm came very quickly, so no one knew. There was only the forecast that there will be rain, but I didn’t think there will be a cyclone. I’ve never seen a storm like this since I was born. I’ve never encountered this kind of severity. Since my birth, I had never experienced a flood as bad as 2015.” (FGD#5)

The attribution by local people of flooding to land development was grounded in their direct experience and the rapid development of this area from a farming area into an industrial zone.¹¹ Most adults could remember a not-too-distant past when flooding of this intensity was rare.

The head (KI#1) of Ban Thapma told us that in the past, the area was just ‘a swamp and rice fields’. The swamp acted as a ‘monkey cheek’ or *kaem ling* (แก้มลิง), he said. *Kaem ling* refers to a flood retention system term popularised by former King Bhumibol Adulyadej. Following the 2011 floods (see above), the King blamed the severity of that event on the conversion of natural water retention areas to other uses. He likened such retention areas to monkey cheeks, referring to monkeys’ habit of storing food in their cheeks to consume later. The village head of Ban Thapma (KI#1) echoed the former King and used the term to describe what happened in the past following heavy rainfall, contrasting this with what happens now:

“...after filling up [the] land for housing estates, the water doesn’t know where to go, so it floods because there is no monkey cheek to catch water like before.” (KI#1)

This view was echoed by another villager who participated in a focus group discussion (FGD#4):

“In the past, *Thung Wa* [Wa Field] absorbed water, but it is now all housing estates. So, where can the water go? The water comes down to the lower areas. It is an unsolvable problem.” (FGD#4)

The mayor of Thapma (KI#3), who had lived in the area for his whole life, agreed:

“In my childhood, this was a water catchment basin, and [the surrounding area] never flooded. This is because there were swamps around the monastery, Moo 3 and Ban Nong Prahm.” (KI#3)

To date, hard flood protection measures have dominated over nature-based solutions and transformative adaptations. Not only are such structural, hard defences against flooding costly,

¹¹ This is linked to the decentralisation of activity from the Bangkok metropolitan region to the Eastern Seaboard dating from the early 1980s and accelerating in the following decades.

but they have frequently resulted in maladaptation (IPCC 2023: 61-62, 106), an outcome also evident in our study. In referring to the role of monkey cheeks or natural swamps in mitigating floods and how their conversion had played a large part in creating the flood risks everyone now faced, our respondents were making reference – although it was not phrased in this way – to nature-based or ecosystem-based approaches to managing flood risk. At the same time, they were implicitly rejecting hard engineering solutions. This shift from hard to soft, from engineering to nature can be seen in other contexts, from approaches to the management of floods in Australia (Rugendyke and Vanclay 2023) to the IPCC’s Climate Change 2023 Synthesis Report where “Ecosystem-based Adaptation [i.e. nature-based] approaches such as urban greening, restoration of wetlands and upstream forest ecosystems reduce a range of climate change risks, including flood risks...” (IPCC 2023: 55).

Over the last two decades, large areas of land in our research sites have been purchased and converted into industrial and housing estates. The style of conversion adds to the flood risk, with such maladaptation disproportionately impacting poorer and more vulnerable sections of local society. When land is purchased, it is not just concreted over but built up several meters as a flood protection measure. This has the effect of concentrating water during heavy rainfall events in an ever-smaller area, exacerbating the flood risk for others. An official (KI#2) at the provincial Department for Disaster Prevention and Mitigation (DDPM)¹² drew a contrast between traditional house styles in provinces like Ayutthaya, Sing Buri and Ang Thong in the Central Plains, which are raised above the ground and where many residents have boats, and those in the study sites where houses are built on the ground. This is because there is no history of flooding and, therefore, no adaptation to floods in house design. Flooding, he explained, only started to become a problem as the area became industrialised and urbanised. In a focus group discussion (FGD#3) with villagers from Ban Nhongllok, one participant said that flooding became a problem when factories arrived in the area:

“Some villagers who [have] lived here for 50-70 years faced their first flood [only] after the factory situated up on the hill [was built] 10 years ago. The factory filled their ground so high; thus, the water flows downward to us who live down the hill.” (FGD#3)

The expansion of factories in the area not only increased flood risk; residents were also concerned that water in the area had become contaminated – full of what they termed ‘rusty

¹² The DDPM under the Ministry of the Interior has been tasked with managing floods (and other disasters) in Thailand since 2002.

sediment’ (ตะกอนแบบสนิม). One respondent in Ban Nhonglalo (FGD#3) told us that “the biggest issue [is not flooding] but the contamination of rusty sediment from the factories”. In the past, it was possible to drink the water, but now “we can’t drink it [the water] at all because it’s the wastewater from the factories... So, we need to buy drinking water.” Wells were contaminated and had been for around a decade (since c.2010).

Local villagers lamented their ability to resist or adapt in the face of the growing flood risk. One focus group participant (FGD#3) from Ban Nhonglalo said with exasperation:

“I can’t get over it, but I have to accept it because I don’t know where else to go. We do not have enough money to raise our own land [above the flood levels]. ...We must accept the situation each year, whether it will flood or not.” (FGD#3)

The mayor of Thapma (KI#3) said there were originally 2,000-3,000 *rai* (320-480 ha) of swampland protecting the area from flooding, retaining water after heavy rainfall, but from 1997 there had been widespread land conversion so that at the time of the research just 200 *rai* (32 ha), one-tenth of the original area of swampland, remained. First came the factories and then, quickly following, housing estates (FGD#3).

Apportioning blame: flooding and local blame-making

There was little difference of opinion in the study sites as to the primary causes of the increased flooding in the local area: land conversion and development, particularly, of the low-lying swampy land that used to act as a flood sink or monkey cheek. Surprisingly, however, residents were reluctant to apportion blame. One of the participants in a focus group discussion did observe that “the capitalists [*nai tun* นายทุน] did [land development] first”, and then many others followed because “after landfilling, the villagers couldn’t live because of floods and so they had to landfill like the capitalists, creating an unending cycle of trouble” (FGD#6). The issue for many residents is that they have directly and indirectly benefitted from this process of land conversion and development. They sold their land as it increased in value. They also recognized that the jobs and other opportunities provided an alternative livelihood pathway to farming or migration, especially for the young. They were, therefore, often complicit in the problem that now afflicted them. ‘Capitalists’ may have been the major beneficiaries, but this is not an area where land with insecure tenurial status has been ‘grabbed’ by outsiders or powerful agents of the state. It does not align with the land grabbing and alienation narrative

resonant in other urbanizing and industrializing areas of Southeast Asia.¹³ In this instance, villagers with title deeds (*chanod thii din*, โฉนดที่ดิน) sold their land and did so willingly – even if now some regretted their actions (see below).

The increase in land value enticed many villagers to sell, even though they realised that as more and more land was sold and converted, flood risk would grow. A group discussion with village elders and leaders in Ban Thapma (FGD#4) revealed that the value of prime land had risen fivefold from two million to ten million baht per *rai*¹⁴ over the previous five years (2017-2022). In Village No. 1 (Moo 1), the rise was even steeper as speculators and developers sought out new, strategically located land, rising from 400,000-500,000 to 3 million baht per *rai* in just two years (2020-2022) (FGD#4). Some local villagers had “moved out” after having “sold all their lands”, one of the Thapma villagers revealed in a focus group discussion (FGD#7), using their new wealth to escape the consequences of their actions.

It became evident in our discussions that villagers appreciated that they were, in a sense, part of the problem because they had weighed the individual returns and community costs of selling their land for development and opted for the former. Villagers may not initially have fully appreciated the ramifications of their individual actions, but these quite rapidly became well-known and broadly appreciated. One older woman (FGD#2) from Ban Nhonglalok expressed regret she had sold her land but said that she “didn’t know what else to do”, adding that “I’m not the only one who sold land, but also my neighbors and friends”. Factories now, she thought, extended over 1,000 *rai* (160 ha) or more. Their village had become “a basin [surrounded by housing estates and factories] that catches water” and faced exacerbated risk of flooding (FGD#2).

Those few who decided to continue to farm rather than sell their land faced not just a growing flood risk but miserly compensation when their land was inundated and crops damaged or lost entirely. The head of Ban Thapma (KI#1) explained the method for claiming compensation:

“The compensation must pass through several steps. [An official comes] to estimate how much was damaged. If the damage value is 100 baht, we only get 50 baht. It’s not enough for the villagers because it goes through many steps, cutting this cost out and out again, so eventually, the compensation is not enough.” (KI#1)

¹³ See, for example, Fox et al. (2018) where Hanoi has extended into rural areas of Vietnam’s Red River Delta and Leitner and Sheppard (2018) on land grabbing in Jakarta’s (Indonesia) extended metropolitan region.

¹⁴ US\$55,000 to US\$275,000 per *rai*, or US\$344,000 to US\$1.718 million per hectare.

If owners had not registered their land for tax purposes, they received no compensation whatsoever; if they had registered, taken photographs at the time, and the damage was then confirmed through an official visit, they received just 1,000 baht per *rai* (US\$27) (FGD#2).

The proximate reason why villagers, in the main, were unwilling to apportion blame and why there was also little resistance and agitation against land conversion and development was because it had brought such relative wealth to villagers – and more than just a handful. It was also because of the employment and other livelihood opportunities that the broader development of the region had generated for residents. Older villagers still remembered a farming past, and some continued to farm. But there was a clear generational divide. Younger villagers were employed in factories and other non-farm work in the area or had left their homes to find work elsewhere. This process was not limited to our study site; it resonates across the country where deagrarianization and the delocalization of work have a common currency (see Faysse et al. 2020 and 2022; Rigg et al. 2020; Rigg 2019).

The blame game: depersonalizing the causalities of flooding

Our case studies reflect the global phenomena of urban encroachment on floodplains that aggravates the life chances and compromises the livelihoods of those living in such floodplains (Andreadis et al. 2022). As our interviewees pointed out, raising ground levels to accommodate new housing projects and factories has compounded the risk of flooding, heaping maladaptation upon maladaptation. Such actions are part of broader processes of urbanization and industrialization in Thailand's Eastern region. Residents in new houses on elevated ground are supported by concrete foundation, allowing them to avoid the effects of flooding personally, even while other residents – even their neighbors – suffer. In this way, flood risk is displaced from one place to another, creating a spatial mosaic of victims, adaptors and insulators, often reflecting their relative wealth status. Indeed, we witnessed in our study sites “uneven socio-spatial distributions of risk” (Colven 2022, 1) that, we suggest, have been exacerbated through state-led modernization efforts promoted by the central and local governments (Ramalho 2019).

The effects of land conversion in our study sites were not experienced equally, either spatially or socially. In Ban Thapma and Ban Nhonglalok, the areas that were repeatedly flooded were the places of residence of villagers; the areas that were purchased and developed by outside investors were generally protected from flooding. This was because investors could build up

and raise their land's level, resulting in other areas suffering from even deeper and longer periods of inundation. Villagers in Ban Nhonglajok were acutely aware of the sequence of land conversion and development that had exposed them to floods:

“...some [villagers] speculated by building up [their land] to add value and sell it. Then [the purchasers] built houses and shophouses. Hence, our village is now a basin that catches water.” (FGD#2)

“...new housing estates built up their land, blocking waterways. In the past, [this area] used to be a large waterway, but when the land is filled, the water accumulates and does not drain away... They live on higher ground than us. Hence, locals are flooded because we live below the street level, and this makes us a catchment area.” (FGD#3)

The style of land development in our research sites was evidence of ‘maladaptation’: adaptation that has deleterious current or future effects – usually inadvertent and unexpected – on certain individuals, particular social groups, or wider society (Schipper 2022). It is adaptation that increases vulnerability for some (IPCC 2022). But maladaptation is more than ‘adaptation gone wrong’, as Glover and Granberg (2021: 15) put it. The qualifiers ‘certain’ and ‘particular’ are important. Maladaptation shifts vulnerability, geographically and socially, from one location and social group to another, exacerbating risks for those who are exposed. It is, therefore, inequitable in its effects, even if normally unintended. It also fails the justice test. The difficulty, as Glover and Granberg (2021) explore in their review paper, is that examining maladaptation as a political phenomenon has to address the temporal and sometimes also spatial disconnections between an action or a policy and its (maladaptive) effects. Furthermore, there is the unintentionality of such collateral damage and the issue of balancing mixed effects, which can be adaptive and maladaptive at the same time, depending on where we look and what we measure.

Bertana et al. (2022) identify four structural challenges that underpin maladaptation. These all speak directly to our case study in Thailand: first, a propensity to focus on technical, engineered or hard fixes rather than more ‘holistic’ approaches; second, the question of whether and how to draw a line between efforts that contribute to adaptation and those that drive development; third, the difficulty of – and the desire to – quantify the unquantifiable (like justice); and fourth, the tendency for adaptation to fall off the map when other, seemingly more urgent, issues have to be addressed. Bertana et al.’s (2022) study draws on interviews with climate change practitioners ranging across the private sector, international bilateral organizations, and

international development agencies. In our case, we interviewed local villagers, community leaders and district officials, but the same issues were resonant. Respondents pinpointed the building up of land to protect factories and housing estates, displacing and concentrating flooding elsewhere; accepted that these factories and associated jobs also brought work and wealth; noted the failure of the government adequately to cost the impacts of flooding and the bureaucratization of compensation; and seemed to think that, in the scheme of things, perhaps flooding was a price worth paying for development.

Notwithstanding all of this – and perhaps because of it – villagers did not blame investors for their predicament; they accepted the situation and lived with it. An expression that villagers used was *tong tham jai* (ต้องทำใจ), which means ‘must come to terms with it’, ‘must accept’, or ‘just get over it’. It is imbued with a sense of fatality and powerlessness born of villagers’ inherited status and situation. One respondent explained:

“I must accept [flooding] because I don't know where else to go. We do not have enough money to raise our own land [and protect it from flooding]. Our house has also been built well, so we don't want to dismantle it. We must [just] accept the situation each year, whether it will flood or not.” (FGD#3)

Contributing to this sense of fatality and powerlessness – and contesting the sequence of causality noted above – was a belief that floods are natural: “The water overflows because the rain is heavy... If it rains heavily for three days, it will flood” (FGD#2). Together, this meant that villagers did not explicitly connect land developers and investors with their predicament in terms of culprit and victim, and questions of justice and restitution did not, therefore, have great traction. The structural environmental violence they faced was depersonalized, even naturalized. Moreover, and in consequence, villagers never asked for or received assistance or compensation from land developers during or after flood events. The institutions that aided villagers were, in large part, those linked to the local government and the Thai state. With the blame for floods and flooding apportioned to nature and fate, the burden of assistance fell to the institutions of the state at local and national levels, members of the Thai royal family, some private companies, community leaders, and the villagers themselves. Notably absent were the developers. Assistance came in the form of food donations, sandbags, help with clearing debris and mud, cash donations, and compensation, but one step removed from the investors and developers.

Conclusion: from karma to blame

In this paper, we have examined the experience of flooding in two sub-districts in Thailand's Rayong Province, drawing on community and key informant interviews and focus group discussions. We set out to explore local inhabitants' experience of flooding, how they interpret the increasing incidence of flooding, and what they do about flooding in terms of both adaptation and political action. Our findings suggest that land conversion and development as part of urbanization and industrialization in the surrounding area were almost universally seen as the underlying causes of the growing incidence and risk of flooding for local inhabitants. Climate change as a factor in the mix barely warranted a mention. The surprise to us, given debates in other countries (see discussion above), was that blame was not apportioned to those agencies and actors who were most obviously the cause, namely developers, state agencies and industrial capitalists. In the past, floods were acts of God and, therefore, matters of karma. They were natural events over which populations had little control. That said, there is a long and rich history of adaptation and living with floods in Asia.¹⁵ This view and explanation no longer had traction in our study sites. The growing incidence of floods was squarely put down to land developments and placed very clearly in the field of human action and inaction.

Our study shows clear links to wider debates on maladaptation (Schipper 2020, 2022). But in this instance, and where our results differ, is that while the losses and damages of extreme weather events are, indeed, exacerbated by maladaptations and, in the process, have become socially and spatially concentrated, our respondents were mainly surprisingly phlegmatic. This was not because they had failed to connect (mal)adaptation with its (mal)effects. Nor did they misidentify the 'root causes' of the disasters (Wisner 2004). But perhaps the floods in Ban Thapma and Ban Nhonglalom were not perceived as disasters at all. Gaillard (2022) argues that disasters are subjective and contextual and, in the world of Disaster Risk Reduction (DRR), an 'invention' of normative policies and practices. Maladaptation is likewise becoming bounded, defined and standardized, and taken forward through generalised policies and practices. At this general and standardised level, Ban Thapma and Ban Nhonglalom have become subject to maladaptation and represent another 'case' to add to the litany of other cases already assembled. Whether they were also 'victims', however, was not so clear.

The disconnection between the identification of causality and the allocation of blame raises questions for how notions of environmental justice play out in places like Ban Thapma and

¹⁵ For example, see Tran et al. 2022, Liao 2019 and Danh and Mushtaq 2011 on living with floods in Vietnam.

Ban Nhonglalo. When environmental harm is so obviously associated with the evolving land market, operation of state policies of development, and processes of capital accumulation, then it would be expected that blame would be quite easily apportioned, thus shaping a sense of environmental injustice that is rooted in unequal experiences of flooding (Sze and London 2008). But this was not the case in these two villages, even while respondents shared photographs of recent floods (see Figures 5 and 6). Evident unfairness does not always translate into calls for justice or larger environmental justice movements.

The inhabitants of Ban Thapma and Ban Nhonglalo were, in the main, middle-income post-peasants. For those middle-aged and older, however, they could recall when the area was rural, and livelihoods were focused on farming, mostly rice and fruit. The fact that the urbanization and industrialization of the area were not just the root cause of growing flood risk but also lay behind inhabitants' attainment of a degree of prosperity and material comfort was not lost on residents. This was the reason, we contend, why so few seemed willing to blame the land assemblers, investors, factory owners and housing estate developers who had financed and driven the transformations that, in local residents' views, underpinned the multi-yearly floods they now faced. A further factor in the mix was the generational segmentation of flood risk and non-farm opportunities. Floods mainly affected the lives and livelihoods of older residents of the villages, those who tended to live in the more exposed areas and houses and whose livelihoods were more likely to be land-based. Younger generations were less affected by flooding and benefitted more obviously from the evolving economy and labor market in the area. Our more elderly residents were aware that the futures of their children and grandchildren were best served by the continuing development of the area, even if this was elevating the flood risk. In this respect, we concur with the recent call to attend to "the everyday" in our analysis of the exceptional lifetime events such as natural disasters, including flooding (Ramalho 2020). These findings from Rayong Province in Thailand highlight the need for "a multidimensional approach to thinking and acting on problems of urban ecological change" (Goh 2019, 250; see also Goh 2020) that recognizes the contested middle ground between justice and injustice. The voices where injustice was the clearest were silent, namely, the two migrants who died in the floods.

CRedit authorship contribution statement

Petchpilai Lattanan: Formal analysis, Investigation, Writing. **Puttaporn Areeprachakun:** Formal analysis, Investigation, Writing, Visualization. **Areerut Patnukao:** Investigation, Writing, Visualization. **Panee Cheewinsiriwat:** Project administration, Funding acquisition. **John Barlow:** Project administration, Funding acquisition. **Hyun Bang Shin:** Conceptualization, Formal analysis, Investigation, Writing. **Jonathan Rigg:** Conceptualization, Formal analysis, Investigation, Writing – original draft.

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Table 1: Characteristics of the community members who participated in this research

Category	Moo 4 Thapma	Moo 3 Nhonglalok
Sample size	19	15
Gender	Male: 9 (47%) Female: 10 (53%)	Male: 6 (40%) Female: 9 (60%)
Age	<30 years: 1 (5%) 30-60 years: 8 (42%) >60 years: 10 (53%)	<30 years: 1 (7%) 30-60 years: 3 (20%) >60 years: 11 (73%)
Occupation	Agriculture: 4 (21%) Trading: 5 (26%) Administration: 4 (21%) Student: 1 (5%) Service Worker: 2 (11%) Unemployed: 3 (16%)	Agriculture: 4 (27%) Trading: 2 (13%) Administration: 5 (33%) Service Worker: 1 (7%) Unemployed: 1 (7%) No Specified: 2 (13%)
Period of living in the community	<10 years: 3 (16%) 10-30 years: 1 (5%) >30 years: 15 (79%)	<10 years: 1 (7%) 10-30 years: 2 (13%) >30 years: 12 (80%)
Directly affected by flooding	Every year: 11 (58%) Some years: 8 (42%)	Every year: 6 (40%) Some years: 9 (60%)

Figure 1. Moo 4 Ban Thapma, Thapma sub-district, Muang Rayong district (inset map B); Moo 3 Ban Nhonglalo, Nhonglalo sub-district, Ban Khai district (inset map A).

Figure 2. Comparison of Land Use of Thapma Sub-District (map created by the authors based on the data of Department of Land Development 2019)

Figure 3. Comparison of Land Use of Nhonglalo Sub-District (map created by the authors based on the data of Department of Land Development 2019)

Figure 4. Core questions framework adapted from USAID (2012), Scoones 1998, DFID (2015), and Magnuszewski et al, (2019).

Figure 5. Data and Analysis Framework

Figure 6. The 2020 flood in Ban Thapma. Photos: Parichat Sutthihuk (Thapma village head) [permission granted]

Figure 7: The 2020 flood in Ban Thapma. Photos: Parichat Sutthihuk (Thapma village head) [permission granted]