4 Projects for Climate Change

"A garden next to the kitchen makes things so much easier. They [the villagers] just go outside and harvest some vegetables. You do not have to go to the bush during a cyclone." For the adaptation programme's advisor, it was especially important that people did not have to walk to their distant gardens during times of adverse weather conditions to supply themselves with vegetables and root crops. Moreover, that every woman, man or child should be able to access fresh vegetables and thus a vitamin-rich diet. Challenges, such as dry times, could be faced by preparing the ground according to principles of permaculture, framed as 'tekem care long graon' (taking care of the soil) – tilling the ground to suit your needs and supporting the growth of your crops, as addressed in the adaptation workshops. The NGO which has worked in the Dixon Reef area (Dixon Reef and Blacksand) regularly since 2012 envisaged challenges of climate change primarily as a matter of livelihood security. Several workshops were held in the village of Dixon Reef, training was undertaken in Santo and Port Vila by a number of community members, and some women and men were trained as multipliers for new agricultural methods. Once the programme had commenced, workshops took place on food security, community management, health services and climate change awareness. The section on food security included training according to the NGO's formulated aims for soil improvement techniques as well as food security through what they called 'innovative and adjusted agricultural practice'. Thus, inhabitants of Dixon Reef established new gardens next to the dwelling houses. Gardening inside the village was uncommon at this time, because the parcels lay behind the coconut and cocoa plantations further inland of the island, but was not totally new to the people of Dixon Reef. They did report how their parents planted cabbage next to the houses. However, the permanent cultivation of vegetables and root crops in tilled soil was a new concept.

As both villagers and NGO representatives reported, when workshops for food security had started, the organisers were enthusiastic that they had many interested people in attendance. When discussing this some years later, it became clear that what motivated villagers at the beginning were the new techniques they expected to learn. In general, every time a workshop or a village get-together had been announced, people were eager to participate. They would gather in the community hall, which had been especially constructed for occasions like gatherings or village courts. Then, even after all those years, many of my interlocutors made time to come to see what was new and the house was filled with attendants. During workshops, people sat on the floor along the walls for instruction, while the narrower end of the building was equipped with a table at which the person in charge of the event took a seat. The second part led people outside, to the specially created community gardens, used as general 'demonstration plots', or to the home gardens. Workshop organisers would first explain the steps of the new approach to cultivation and then put theory into praxis on the plot behind the community hall and directly within the village. Gardening and village life became one and the same in the workshops; however, workshop participants, as I will show on the following pages, saw this as not restricted to the village land itself.

In this chapter, I look at the activities of the food security and climate change adaptation programme in the Dixon Reef area in connection to gardening or mekem garen. As I will show, mekem garen is formed by the processes of climate change and cultivation – both in the eyes of NGO representatives and villagers. However, because workers of the NGO concentrate on climate change as environmental transformation with implications for people's social and cultural life, whereas people in Dixon Reef relate it to life itself, mekem garen becomes a topic of discussions. In the previous chapter, I have described how Dixoners perceive klaemet jenj in connection with the multi-facetted changes in communal life. In this chapter, I show that mekem garen is characterised by change. This will also show how the programme's approach of preparing and tilling soil, taking care of the ground by transforming sandy soil for home gardens into a fertile base for cultivation is juxtaposed with the gardening experience of my interlocutors. However, this does not mean that in practice both approaches do not make sense in their own way – instead people also develop new approaches to cultivation. I thus follow two lines of argument, which both refer to what I will call ontological friction: first, that in the case of discussions with villagers about home gardens, there was no reference to what mekem garen actually is for the people of Dixon

Reef. Second, I argue that diversification in horticulture is the reason why people are always interested in new things, including participating in projects for new agricultural methods. This dissolves the questions as to whether people should continue to cultivate using, what other studies call 'traditional methods', or whether they are open to new ways which allow for constantly creating something new, also seen through frictions in workshops. I argue that a distinction between traditional knowledge and new knowledge does not help in terms of understanding what people do, but that garden praxis is characterised by flexibility, and furthermore that frictions can be moments of creating new ways to move forward.

4.1 The Genealogy of the Abandoned Home Gardens

The food security part of the programme focused on establishing home gardens, inspired by and loosely following the principles of permaculture.[1] Permaculture, in its systemic and holistic approach, tries to think of cultivation from the bottom-up, from soil. It aims to improve and maintain soil quality, considering the work of humans with microbes, water and the soil in general. Permaculture owes its emergence to a counter-movement to industrial monoculture, and the inventors' aim was to promote sustainable soil use, as well as to bring farmers to consider soil quality and more directly into working with the soil (Mollison 2004). Julius Krebs and Sonja Bach explain that the neologism 'permanent' and 'agriculture' puts the focus on sustainability and continuity. Planning and implementation are essential aspects here, and the use and combination of various proven soil management measures of compost with grey water use, mulching, organic fertilisers and polycropping. Permaculture emphasises the sustainability of farming and growing food (Krebs and Bach 2018). Examples from all parts of the world show that new approaches to soil processing are rethinking both agricultural movements and social communities – for an environmentally-friendly mutuality that also restructures communal life (Stodulka

1 Permaculture is an established term for a holistic systemic way of life originating in Australia with a focus on agriculture. "Permaculture's central concept is that humanity can reduce or replace energy and pollution-intensive industrial technologies, especially in agriculture, through intensive use of biological resources and thoughtful, holistic design, patterned after natural ecosystems (eco-mimicry)". (Morel, Léger and Ferguson 2019, 1)

2024). La Puig de la Bellacasa (2017) emphasises the concept of care work in permaculture – and with this, reflects on forms of thinking with the environment and people. In her own involvement in the permaculture movement, she relearned everyday relations to the ground through touching and working with soil and with it 'the earth' and thus 'alternative ecological doings' (ibid., 147). She analyses this transformed approach to the environment as follows: "I take care of Earth, via soil and the worms, because I need them, because they are of use to me." (ibid., 147) This 'working-with-nature' (ibid.) was also reflected in the Dixon Reef area climate change workshops, in which the workshop leaders explained this individualistic permaculture approach as a way of working with the soil in a sustainable manner, not exploiting it through burning, and further giving something back to the soil. The two women from Vanuatu and Papua New Guinea followed 'tekem care long graon' (taking care of the earth), as an all-encompassing change of life through agriculture, and with it preparing everyday practices of soil and human for climate change. Hence the programme was called 'kakai fo laef' (Food for Life) and not only implied food security but also the creation of sustainable lifestyles for changing times. In the adaptation programme, the notion of care became a central notion. Bellacasa finds in her book: "care as the fostering of the endurance of objects through time (maintenance against breakdown), haptic care for the imperceptible politics of the everyday (rather than the irruption of events)" (La Puig de la Bellacasa 2017, 171). For the Dixon Reef area 'tekem care long graon' became the Bislama slogan for transformative methods of giving the ground you chose for your gardening the possibility to be transformed through working with it. These are transforming approaches for times of changing environmental circumstances.

In discussions with the programme coordinator, a woman who had grown up in Vanuatu's urban environment, having her own garden plot next to her town house in Luganville on Espiritu Santo, and experienced in techniques of permaculture, made apparent her support for innovative cultivation methods. Integrating aspects of permaculture into Vanuatu's rural gardening practices would, in her view, be an asset for rural food security and lead the way for a modern way of gardening. Setting fire to the bush in order to make room for new garden plots is considered to further intensify problems of droughts in Vanuatu, and also contribute to emissions. Therefore, the coordinator especially found permaculture methods interesting, on the on hand, because they would fit easily into the way people approach their gardens, having family gardens for self-supply and polycropping, as well as making cultivation in a single place possible, thus providing a new view on cultivation by being equipped to

repeatedly grow crops in the same spot. The idea was not to completely leave behind current gardening methods, but to have the home garden as a continuous backup and additional safety net for food security. It was meant to supplement the garden networks people built up – especially in times of prolonged droughts or shifting seasonal weather patterns. The Bislama expression 'tekem care long graon' (caring for the soil and the ground), for the project leader, meant trying to protect it from strong sunlight or flooding. In addition, growth is stimulated by adding nutrients, which participants liked to call 'fidim graon' (feeding the soil). While the gardens in the 'bush', outside of the village, undergo a number of cultivation stages until the plot eventually lies fallow for several years, the home gardens should be continuously cultivated. The programme included a large number of practices of soil preparation with organic fertilisers and nutrients, such as using compost or grey water for soil irrigation, or mixed planting methods that support each other's growth due to nutrient supply and defence against pests, organic fertiliser, accumulation of soil for planting on small mounds, mulching or green manure and intercropping with trees like gliricidia (Gliricidia sepium).

Due to the sandy nature of the soil along the shore where most villagers' houses were located, the NGO intended to teach people to prepare their soil ahead of planting as well as during the whole process of cultivation. The programme therefore included a large amount of soil preparation with organic fertilisers and nutrients, such as using compost or grey water for soil irrigation, or mixed planting methods that support each other's growth due to nutrient supply and defence against pests. Recently-installed showers next to most of the sleeping houses had an additional function – the run-off greywater served as irrigation for the adjacent garden areas. Workshop organisers invited different groups of villagers, among them always one representative of papas, mamas and the youth, to workshops to learn how to make a garden with organic fertilisation. Participants were then encouraged to apply what they had learned within the workshops to their own home gardens close to their dwelling and kitchen houses. And as the work began, they fenced areas next to their house and started to grow all kinds of food, especially aelan kabij (island cabbage; abelmoschus manihot). The permanent cultivation of vegetables and root crops in tilled soil was in fact a new concept. When I was asking among my interlocutors, it became clear that what motivated them to attend the food security programme were the new techniques they were expecting to learn. During one such workshop, we first discussed new approaches and then stepped outside, cleared an area for the community garden, fenced it in

and then started to subsoil with manure. The community gardens intended for local people and workshop leaders to try out new methods together.

In 2015, the gardens blossomed. Spring onions and lettuce were planted in the centre and island cabbage, along with manioc, in between, with even a yam or two being planted where space allowed. Retrospectively, workshop participants explained to me that they were very proud of their achievements and Dixon Reef became the NGO's flagship project, with pictures of villagers and their harvest in the reports. One of the women thought back and said: "You could see them everywhere, we all put effort into our garden." One of the chiefs, living only a few metres from the ocean, was proud to tell me that when he managed to grow a banana plant in the sandy soil next to his house, other villagers came by to admire his achievement. My interlocutors told me that they were very proud of their flowering gardens, especially of the fact that they managed to do this despite the sandy, nutrient-poor soil. Subsequently, a few individuals from the village travelled to Espiritu Santo to the Agriculture Training Centre or to Port Vila to the Agriculture Department to learn further innovative approaches to agriculture, returning to share their training with their families.

By the end of 2016, during the continuing El Niño drought, I could count only a few home gardens scattered around the villages, but nothing like the numbers I had been led to believe from stories of the previous years. The NGO supervisor was already complaining that villagers were not maintaining their 'smol garen' (small gardens). In March 2015, Cyclone Pam hit Vanuatu (see Chapter 1). People continued to grow their plots in the 'bush' outside the village, under the aggravating conditions of the drought. Many lost a whole year of the yam harvest and said that the only thing that would grow well in this kind of weather were manioc and mangos. However, most of the home gardens lay fallow and the plants were left to fend for themselves. The representatives of the NGO, especially the programme's coordinator, were irritated by this development. They were surprised that villagers would not follow up on the permaculture approach, since those cultivation methods were especially designed to help in dry weather conditions. When we looked back on this development together, the coordinator would shrug her shoulders and look at me questioningly: "And why would they walk a long time to the bush, when at least vegetables can be cultivated right next to the houses?" The once successful story of transforming the whole village into a garden site had not been continued. Discussion between the NGO representatives and villager heated up when villagers pointed to the more-than-human village residents, like chickens or pigs, who, in times of scarcity ate the last of the fresh leaves of

island cabbage. Additionally, they pointed out, the sun heated up the soil and cancelled out all their efforts towards cultivation. In reply to this, the representatives of the NGO insisted that newly-introduced methods like mulching would make sure that ground and plants would be protected from the strong sunlight.

At one of the follow-up workshops, the programme coordinator raised this question again. That time, I looked around the quite full room, just to see people being indifferent to this question. Finally, some of the men reluctantly replied that the extremely dry weather of 2016 simply did not allow them to manage the ground in the way described. According to them, the dry season made it impossible to grow anything in the sandy soil. In fact, over time, Dixoners turned away from these discussions – although the questions of why there were different approaches to gardening remained. Out of professional curiosity, I found this insecurity on all sides interesting and tried to analyse this development with my individual interview partners. One day, during a long conversation, this was put into perspective by the NGO's field officer, Jean. Jean was a man in his 40s, living in the village all his live, always curious to learn different agricultural concepts and to apply them in his current own garden practices. He had been trained as a permaculture expert, then later acted as the link between villagers and the organisation. His own home garden had been one of the more elaborate ones, with a large number of root crops, legumes and vegetables standing side by side. During El Niño he had spent most of his time cultivating his food crops outside the village and over time the garden at the house had become overgrown. Reflecting on these discussions about the abandoned home gardens, he found an expression for the general attitude of the people in Dixon Reef:

> I know, with permaculture they want us to force the ground. With everything, they want us to add and change it. But *we* cannot force the ground. I know that they think with permaculture you can just do the things you planned for, but if the ground soil doesn't want to, there's nothing else you could do.

From Jean's point of view, the anthropogenic influence on the soil had its limits, a limit indicated by the soil itself. Women and men in Dixon Reef could not get the soil to follow human demands. If crops were not supposed to grow, whatever the reason, villagers left it be – for the time being. Here, de la Bellacasa's demand to 'listen to' (2017, 147) more than just the human perspectives in or-

der to know how to work it takes on a new dimension, in which the soil itself determines the possibilities and limits of cultivation. The actors of the NGO grew irritated that villagers enthusiastically followed the 'new approaches' to agriculture for the first couple of years, but then did not keep up the work with continuity in the long run. My interlocutors within the village were not quite as frustrated and still spoke positively about the project because they had learned a lot. A statement from one of the women showed that this was not the end of the process for all: "I tried to do it and it worked – maybe I [will] try it again." Indeed, the story does not end here.

In April and May 2017, while I was still in Dixon Reef, Vanuatu experienced two milder tropical cyclones. Neither caused heavy damage – the bamboo kitchen walls blew away, which people laughed about and immediately set about weaving a replacement from new bamboo plants. However, these storms brought a lot of rain. All of my interlocutors saved some crops they had cultivated along the riverbank in the plain once the winds had calmed down, and replanted them along the hillside. Shortly before I left for Efate, I used these last few days to visit various people on Malekula for a final get-together and attempted to view a few different corners of the village one last time. One day, I walked through Dixon Reef and saw women working behind the last row of houses, which face the hill. They had started to establish new backyard gardens, this time along the hill, where rain had washed soil down to the shore and mixed it with the sand at the beach. They did this using the technique of mulching, putting gliricidia branches (Gliricidia sepium) into the ground. They also dug water channels. At the time of my visit, the women were about to plant banana offshoots and manioc. When I asked them why they were doing this, they replied: "Now is a good time to start a backyard garden." Returning in 2019, I saw a mixed picture. Some villagers had re-established their gardens next to the houses, some had moved them to other locations and some had turned to other garden projects while seeing what they had experienced regarding the home gardens as a test and an interesting learning process. The NGO had, in the meantime, moved onto the next phase of the project which focused on the cultivation and manufacturing of cacao. However, the main representative was still irritated about the fact that people in Dixon Reef had not continuously followed the 'rules of permaculture' which, in her view, made home gardening possible under any weather conditions.

4.2 Ontological Friction in Encounters

The case of the abandoned gardens illuminates two elements: first, prior to the workshops, representatives of the NGO and horticulturalists in the village had failed to explain their respective approaches to the practice of cultivation. Only after village participants had followed another path and ignored the promoted methods, did discussions arise. Second, my interlocutors living in the Dixon Reef area are open to new input and are keen to follow up such ideas, although not necessarily in the way anticipated by the representatives of the NGO. The NGO's approach to gardening was expressed through knowledge about permaculture and 'taking care of the ground' on the one hand and how Dixoners approach it by 'not forcing the ground' on the other. The case of the abandoned home gardens demonstrates the results of what I call 'ontological friction', which is at the same time a re-enactment in praxis (Jensen 2021) of approaches to gardening among my interlocutors.

What happened over the years was that both villagers and representatives of the NGO were gradually more irritated that things did not go the way they expected, or rather, that things were done in a way that seemed incomprehensible to them. Discussions came to a stop when villagers simply stated that they would continue in the way their bubu (ancestors) had told them, and they did not see any alternative. NGO representatives, visiting the village on a regular basis, gave up arguing, saying that people simply did not want to participate with the new methods learnt in the workshop. However, and I will continue to explicate this over the following pages, my understanding is that my interlocutors in and around Dixon Reef were in fact very willing to try out the new methods. However, they did this not in the linear way that was intended, instead using the techniques in other areas, for example, in the garden plots outside the village, and only after some months returning to their home gardens and starting them again. Although this is an example on the micro level, embedded in everyday lives of people living on the western coast of Malekula, these lives are embedded in universalised dialogues through climate change discourses (cf. Tsing 2005).

Climate change as a global topic is based on global interactions while being at the same time the cause of global interactions (Chapter 2). Anna Tsing made us aware that global interactions cause 'friction' between the actors involved, emphasising the unexpected and unstable aspects of global interaction (Tsing 2005). Through these interactions, something new is created, globalised discourses and practices are not localised, but the global is worked out locally

(ibid., 2–4). Friction is hereby "the awkward, unequal, unstable, and creative qualities of interconnection across difference" (ibid., 3). The specific is always created by global interactions. I take on Tsing's thoughts, and additionally I follow the approach that "knowledge travels" (ibid., 8) as an idea (de Wit, Pascht and Haug 2018), the notion that through endeavours of different actors, knowledge is produced in different localities and thus is produced as a local topic at the same time as a process of world making (de la Cadena and Blaser 2018; Chapter 2).

Ever since climate change has been high on the list of international organisations' efforts, Vanuatu, as well as other countries in Melanesia, has been at the centre of efforts. Encounters of international, national and local actors in the development discourse show, for example, that different parties approach the matter differently (Sillitoe 2010; West 2006). Paige West explained why the Gimi in the Highland area of Papua New Guinea did not want to follow the conservation-as-development projects' plan to retain the status quo of their forests and livelihoods. What the Gimi expected through building a relationship with the actors of the conservation project was a permanent, future-oriented connection to what they expect to be offered them from the outside, what they refer to as 'development' (West 2006, 217–20). In her case study, West made clear that the various actors involved in the Highlands communicated on the basis of different assumptions. When the development project wanted to proceed in economic and thus material improvement, the Gimi saw development as a way of building relations with people outside their area (West 2006, 221). Taking this discussion into the era of climate change projects, political ecologist Sophie Pascoe considered a case for climate change mitigation of the REDD+ programme in the Milne Province in Papua New Guinea, describing how local people conceptualise the mitigation measure of carbon storage as 'stealing the air' – approaches to preservation were seen here as destruction (Pascoe 2021). Therefore, strategies of saving were perceived as destroying something essential for living in the forest. Pascoe also drew on Tsing's concept for "tracing the relations and frictions" in REDD+ projects (Pascoe 2018, 88) and to show how "ontological assumptions" influence these interactions (Pascoe 2021, 2). Her ethnographic example demonstrated that the actors of the mitigation programme used charts and explanations to define climate change based on climate science, and that their approach described climate change as acting in a linear causality and temporality. People in Suau, where her case study took place, would either say that they have another concept of climate change and its causes or explain that the experts do not explain it well enough for locals

to understand. Although operating with specific concepts, a discussion about what people understand by these concepts, e.g. of land, air and conservation, was never given any room (Pascoe 2018; 2021).

I am adding here another perspective and framing from conservation projects in the Americas. Mario Blaser, who is also referred to in the analysis of development projects (cf. Meurer 2021; Pascoe 2021), has provided the impetus for considering such projects on an ontological level. He referred in his ethnographic study of the conflict between members of the Yshiro indigenous group, government representatives and representatives of the NGO in Northern Paraguay, to ontological differences between the actors. He explored the introduction of a new programme for commercial hunting to become more sustainable, by reducing the high amount of animal kills. However, the conflict between the different actors involved, according to Blaser, became obvious when it came to "conservation" (Blaser 2009, 12–13). The "hunting program had been based on a misunderstanding about how to achieve the sustainability of the animal population, albeit a particular kind of misunderstanding" (ibid., 10). The 'Yshiro conservation' in this case was not taken seriously. "But once it became clear that this translation was based on an equivocation, Yshiro conservation was seen either as a clever manipulation of culture or as being based on error" (ibid., 16). Blaser wrote that what really made the difference in these encounters was the existence of different environments, ontologically different worlds that meet, and he criticised the fact that these different environments are never raised for discussion, but are rather seen as a given for the respective parties (ibid., 15–16). The conflicts or misunderstandings which evolve when the different parties encounter each other are ontological ones relating to the meaning of conservation (Blaser 2009; 2013). However, Blaser not only described conflicts and misunderstandings, he also wrote that through these encounters, worlds "are brought into being" (Blaser 2009, 11; 2013), when people meet and interact with each other. Thus, these encounters enact the performance of the practices which again emerge through such performances. Ontological assumptions are not fixed entities, but they are continuously becoming, and are thus part of (or are) the making of worlds (de la Cadena and Blaser 2018, 5–6; see Chapter 2). Through interactions, and this is where I see a connection to Tsing's work, aspects of life come into being. I combine these different but related notions to the concept of ontological

friction.[2] Frictions cause irritation but they also have the potential to create something new, and they do this through ontological quarrels. This is why I take the analytical concept of ontological friction as something that causes irritation and raises inequalities in projects, but also as something which brings into being moments of creating what is happening at the moment. The concept under quarrel in the case of the abandoned gardens of the village during the project is the praxis of mekem garen. In a similar way to the examples of encounters just explained, in the case of the abandoned house gardens described above, one important key concept was never discussed: what 'gardening' is for the NGOs and what it is for people in Dixon Reef. In other words, communication between all actors took place, leaving aside an important issue – the actors' approaches to gardening itself.

4.3 Everyday Knowledge and Knowing

Climate change projects are generally future-oriented, concentrating on anticipated challenges and their solutions in the form of adaptation. Studies by geographers for Vanuatu provide examples of how people are facing those anticipated challenges. By this they are referring to local practices as TEK, Traditional Ecological Knowledge (McCarter and Gavin 2014a), indigenous knowledge (Sillitoe 2010; Warrick 2021) or local knowledge systems (McNamara and Prasad 2013). They ask how these practices, knowledge or knowledge systems can be equipped for anticipated changes, or how they can be useful in times of change, though under the threat of being lost. Governmental measures and non-governmental projects in Vanuatu refer to this view and encourage people to use certain agricultural techniques and "standardizing global knowledge" (Tsing 2005, xx), which people can incorporate into their daily lives.

In general, NGOs in Vanuatu working in different villages repeatedly emphasised that many people were interested in and participated in their projects (be it climate change or other areas, e.g. hygiene). People were open to hearing something 'new'. Edward Hviding grounds this curiosity in the practice of the

2 The expression 'ontological friction' has been used so far only by a few scholars. Most do not define it at all (e.g. James and Steger 2016; Klenk and Meehan 2015; Miller 2016; Nightingale et al. 2020), while others relate it to Tsing's concept of 'friction' (e.g. Neurath 2018).

dual orientation of people in Oceania, both inward and outward. He describes this as follows:

> The typical approach taken by Pacific Islanders to the islands environment, then, is characterized on the one hand by detailed knowledge of and intense engagement with the land […], and on the other by a fundamental outwards-looking view of the world as not confined to the home island but connected across the ocean with other natures and cultures. (Hviding 2003, 254–55)

In order to combat climate change, the aim of climate measures in Dixon Reef was both to preserve most of the current practices, including so-called 'traditional knowledge' (because the knowledge to which they refer is a practical knowledge for the cultivation and preservation of crops) and to add new techniques and thus expand people's repertoire. According to their programme goals in working communities like Dixon Reef, the NGO aimed to implement changes, framing these changes as an improvement in the knowledge of communities, which they defined as 'traditional agricultural methods'.

Other scholars theorised what they framed as people moving between the poles of 'traditional ecological knowledge' (McCarter and Gavin, 2014a, 2014b; McNamara and Prasad 2014), indigenous knowledge (Carter 2019; Sillitoe 2010) or local knowledge, encountering new knowledge from external sources.[3] Sillitoe describes development programmes in the highlands of Papua New Guinea as an approach of external actors based on their scientific knowledge, and this is certainly true for programmes in other parts of Melanesia: "[A]gencies assume that they have knowledge relevant to advancing development and that they know what comprises development." (Sillitoe 2010, 16) What people know on the ground is to be assumed to be a valuable asset to be combined with scientific knowledge (ibid., 26). What development discourse calls 'local knowledge' or 'indigenous knowledge', environmental approaches call 'traditional ecological knowledge', adding the ecological connotation. This is also present in measures for climate change adaptation. Ecologist Fikret Berkes defines Traditional Ecological Knowledge (TEK) as "a product of enduring links between humans and the environment" (Berkes 2012, 288).

3 Tradition itself is a contested term in the Pacific (Mallon 2010), it is further used in political and academic discourses in Vanuatu (cf. Regenvanu 2010) but now often replaced by the more flexible term kastom, which is used among ni-Vanuatu.

In Vanuatu, according to geographers McCarter and Gavin, this 'traditional ecological knowledge' also includes the 'methods of creating gardens' and 'botanical knowledge'. In their study, they found that ni-Vanuatu (including those in Dixon Reef) see a decline in 'traditional ecological knowledge' and therefore a change in lifestyle, but value such knowledge as necessary to secure their everyday lives (McCarter and Gavin 2014a; 2014b). Other geographical studies assume that the loss of 'traditional ecological knowledge' is seen as something that increasingly challenges ni-Vanuatu when facing climate change (McNamara and Prasad 2013; Warrick 2021). Loss of local knowledge practices are increasingly perceived as critical in political and some scholarly discourses, because they are seen as valuable for dealing with climate change risks. There, scientific knowledge and indigenous knowledge are juxtaposed, but the first is only aiming to influence the latter, giving indigenous communities the opportunity to complement what they 'already' know (Carter 2019; Field et al. 2014; Lebel 2013). All of these studies make a distinction between knowledge which exists at one location and knowledge which comes from outside, describing 'local' knowledge as something requiring preservation or complementation through new knowledge (McDonnell 2020).

Other scholars focus more on the procedural gathering of Oceanic knowledge (Mondragón 2014; Richmond and Sovacool 2012, 843–45; Warrick 2011; 2021). Describing the processes in Vanuatu as corresponding to traditional (ecological) knowledge or new (scientific) knowledge is to risk simplifying the lives of the ni-Vanuatu. Anthropologist Carlos Mondragón explained that to differentiate these two poles is indeed difficult, stating that the lives of people on the Torres Islands, the most northern islands of Vanuatu, are never purely local:

> Local knowledge in the Torres Islands, and indeed in most of Vanuatu today, is neither simply 'traditional' nor purely local, because for at least 150 years it has been defined in dialogue with various extra local actors, frames of reference and agendas. (Mondragón 2014, 4)

Mondragón argued for knowledge in Vanuatu to be understood as processual (ibid.), and therefore undergoing change. As Hviding wrote that knowledge practices are shaped by interacting with different 'environments', this would mean that people are used to encountering new ideas. This is part of their everyday practice.

Anthropologist Verena Keck referred to practice theory approaches in the introduction to 'Common Worlds and Single Lives: Constituting Knowledge in Pacific Societies' (1998), focusing on everyday practice and how such practices "continuously respond to new situations" and that people's knowledge is at the same time situated and performative (Keck 1998, 7). She defined this kind of knowledge as everyday knowledge, thus:

> 'Everyday knowledge' is less a conceptual kind of knowledge than a procedural knowledge connected to specific contexts. It is knowledge that is not only an understanding system but at the same time and in particular an acting system as well. (Keck 1998, 10)

In order to do justice to the procedural, as Mondragón also intended, Keck therefore spoke of "knowing" (ibid.).[4] I will follow this and regard 'knowing' or knowledge practices as performative acts that follow 'scripts' (Keck 1998), but which are produced in the doing. In this chapter, I will point to the processuality and flexibility in garden practice of my interlocutors around Dixon Reef, as part of knowing (Pascht 2019). At the same time, I consider, following Ingold (2000), environmental practices "by watching, listening feeling" (ibid., 99) – and by mekem garen.

Ontological friction is part of these 'knowledge practices' and I will show in the following sections that ontological friction arises here between what is understood by gardening – namely between what the NGO representative calls "caring for the ground" and what one of my interlocutors explained as "not forcing the ground". I will additionally show how Dixoners' approaches to their gardening are processual and are produced and re-produced through ontological frictions in encounters of people from inside and outside. This already starts with their learning how to mekem garen.

4 Keck also refers to Schank and Abelson (1977). Everyday knowledge is also practical knowledge. There is an everyday praxis which forms the 'script' of our everyday lives (Schank and Abelson 1977, 20, in Keck 1998, 9–10). As Hviding describes for people living at the Marovo Lagoon, knowing oneself is processual and must be connected to seeing and hearing (Hviding 1996, 369).

4.4 Learning Gardening

When I lived in Dixon Reef, I learned from my interlocutors how to plant and how to harvest. Although I was not able to do gardening on my own in the same way as the villagers, I was able to gain some insights through glimpses into my learning process and that of others. While I was learning how to handle a knife, how to plant bananas and all the other crops and working in gardens at the house and in the wider area along the coast and inland, I also learned together with children. Saturdays (and of course school holidays) marked moments when families went to 'the bush' together with every family member[5] and they devoted the whole day to gardening. Gardening was also carried out on week-days although adults had only a few working hours, because they had to take care of the school children both ends of the day. When leaving the village to conduct horticulture and visit the garden areas around the village, it meant walking and working in groups. These groups consisted of either nuclear families, individual family members or friends. Young men liked to break away from this habit and roam around alone (for detailed descriptions of a garden day, see Chapter 5). The younger children jumped behind the adults or teenage siblings, spent their days exploring the area or observing the work of others. When I, as an adult who had grown up in town without access to a garden, came to Dixon Reef and asked for a bush knife to carry along with me while I accompanied people to do their work, the reaction of the villagers was understandably sceptical. However, after some time, people expected me to not stand around, but also to work. Since there was little chance of conversation during the working part of the garden day, people rarely bothered to explain things to me.

When I was standing for the first time in the garden plot holding my knife and trying to do some weeding, I realised how challenging it is to hit the branches of the regrowing trees and small shrubs at the right angle so that they are cut down directly. Children are handed a knife at a very early age, accompanying their parents at the weekends and during school holidays.

5 This is true for both of the communities where Arno Pascht and I worked with community members. Since Sunday was the day for church, Saturday was the only day for the whole family (with the children) to achieve gardening work together and work the full day. On other days, couples would go alone or women accompany one other. The school children's holiday period made a welcome exception for all Dixons, young and old. Then they had the full day to take care of their cultivation.

They watch their parents pile up the organic material to make fire, digging out yam or offshoots from banana plants to plant somewhere else. When young Dixoners are about eight years old, they start to work their own gardening plots at the sides, trying out the methods observed. Parents would allow them to continue as they saw fit, judging the results only at the end. When I tried the same, I experienced people coming to see what I was doing and saying, especially my host parents: "Oh, you don't know it, this is wrong." They would then simply let me repeat my actions until I got it 'right'. I therefore tried my best to do what I thought was right. My working group would observe every step, dig and cut, jumping up when they thought something was going wrong. "No, you do not know how to do this, you do it like this" – the person would then take over and show me how to plant, first smaller food crops like manioc, corn and island cabbage, and soon bananas and yam, and then let me do it again. The next time, when I followed another group of women and I wanted to show off my newly acquired skills, my moves would be observed carefully and many comments made about my attempts: "Oh, so that's how you do it. Yes, that is possible." It was obvious that they themselves would do it quite differently, but they let me act in my own way. Kindly-worded indignation spread after some months when most thought that after all this time I must now know how to work the garden. The children were treated in the same way, always teasingly and never in a punitive tone.

There exist only a few detailed descriptions of different ways of planting or working the garden from anthropologists (Calandra 2017; Rio 2007b),[6] which show that gardening techniques differ from one location to the next, and names of planting methods refer to the place of origin. The Malekula style of planting yam tubers is well known on other islands (Calandra 2017), and when I stood in the garden with villagers from Siviri, they told me that what they do differs from what people in Malekula do. In this way, the people of Siviri emphasised that there are different ways of planting manioc, but that it should still be done in the 'right' way. When I planted yam with people around Dixon, they would say "This is how we do it here" and their method indeed resembled what other people would call the Malekula style, but they would also say that in the next village the ground is different, so yam is planted differently.

6 Geographers, biologists and others seem more concerned about plants, cultivation and food security in Vanuatu (cf. Allen 2015; Lebot and Siméoni 2015; Siméoni and Lebot 2012; Walter, Lebot and Sam 2007).

Talking to the few elder people in Dixon Reef about how they learnt their gardening techniques, they referred to the gardening practices up in the hills in the past and thus gave me some insights into gardening before 1950, before people moved down to the coast (see Chapter 1). Unfortunately, only a handful of them still know from first-hand experience how life was up in the mountains at that time. One of them, called 'Tambi with the three legs' because he was walking on a stick, referred to these time as "gardens were plenty, but people were not". However, families spent most of their time in the garden, since they had a lot of time to do so. Living in hamlets with a house for women and the men's house, couples met in their gardens and spent the day there, accompanied by their children.[7] In this way, children slowly learned by imitating their parents and by trying out techniques themselves. Agricultural methods in Melanesia, as everywhere in Oceania, are influenced both by different environments and different plants (Manner and Thaman 2013). However, it is also the case that there are similar plants to be found everywhere. Biologist and ethnographer Jaques Barrau, after visiting different sites in Melanesia at the beginning of the 20th century, wrote down that he learnt that people would undertake their gardening according to their environment, depending on whether they lived in the highlands of Papua New Guinea or the coastline of the Solomons. At the same time, they did their gardening at different spots around their hamlets. Cultivation was not limited to specific localities or plants (Barrau 1958; Weightman 1989). Barrau described for the beginning of the 20th century that agriculture in Melanesia has been under so many influences that neither origins of plants, nor the origins of agricultural methods can be traced back to a certain origin. For the Taro (Xanthosoma) plant he wrote the following:

> In New Caledonia, *Xanthosoma* is known as New Hebrides taro or as *tiwaka* taro after the district where it was introduced from the New Hebrides during the nineteenth century by the Catholic mission. In the New Hebrides, *Xanthosoma* is called Fiji taro […]. In Fiji, however, *Xanthosoma* is called *dalo ni tana*, which apparently means tanna taro, Tanna being a southern island of the New Hebrides. (Barrau 1958, 64)

This document would then refer to gardening in past times, to which interlocutors refer when they talk about their bubu (ancestors). The way in which

7 For past gardening and changing social life see also Chapter 6.

they conduct their horticulture, they say, is according to the ways of the bubu. Although they explain the learning of their gardening techniques by looking back, this learning in fact also includes the practice of always including something new into cultivation, by planting new species or crops or changing planting styles. In the same way, sources for learning for my interlocutors are oriented towards a whole range of sources and are influenced by copying what others do and teach, as well as by their individual practice within their practical learning surroundings.

When I asked the young people, who were accused of being on their mobile phones, where they learnt mekem garen, they mentioned school, where agriculture was part of the curricula, and they explained that they learnt how to grow vegetables and some root crops. Planting yam, on the other hand, all my interlocutors called a family business, because they had learnt it from their parents (or the people they spent most of their time with during their childhood and adolescence). Practices inside the yam garden plot are not often shared amongst larger groups (cf. Rio 2007b). Although today most of the rules are dropped or 'not respected' as some of the men told me, the yam garden marks an exception. How to plant yam stays with the family, or with the community, and people told the representatives of the NGOs that they would never change their methods of undertaking this task. I learnt the whole process of planting a yam garden when I started my own. With the help of our neighbours, some of the nasara chiefs and younger men for the climbing work on the larger trees, we cleared and burnt the vegetation before we planted the yam tubers.

Staff of NGOs as well as from the agriculture department promote and try to implement gardening without slash and burn, because they want the villagers to stop using fire due to its contribution to climate change. However, in conversations with us, these staff members complained because most villagers did not follow the recommendations and new methods of implementation. In most of the villages Arno Pascht and I visited over the course of our fieldwork, we heard people complaining about the implementation of gardening without slash and burn. Dixoners also had this discussion with the staff of the NGO. They assured them and us that preparing the ground for planting with the help of fire is the appropriate way to work. When I asked my garden companions about this, they mostly explained that it was ultimately a matter of preparing the soil. When the soil was good for planting, then the ground could be cleared and dead material left on the ground, similar to what the agriculture department refers to as 'mulching'. The elder people in particular told me that today

people did not know the right way of planting yam, or did not show enough respect for the yam garden.

One of the men in Dixon Reef explained that, although he respected the way in which his father and mother taught him, he is discovering his own way of gardening himself.

> Compared to when I was young, at that time I just worked in the garden as it suited me. I didn't follow exactly what my parents taught me. After that, when you grow up and get married, you find out how 'mekem garen' works, you figure it out together.

When I asked him: "But now, do you follow the same style of mekem garen as your father and your mother?", he answered:

> Nowadays, now that we have climate change, ok today we are changing our style a bit, in the garden. For example, how we plant yam has changed. We used to scrape off the top layer of the soil. Then we planted. But nowadays we change that and all the dirt (organic material) just stays. That's what the [the NGO] people said, all the dirt just stays and it feeds the soil where we then plant the yam.

It does not seem to be the aim of the villagers to copy the gardening methods of parents or bubu (ancestors) exactly, or to follow any rules in a precise fashion. Younger people in particular repeatedly emphasised the different sources of learning – parents, school, friends and spouse. However, the decision is ultimately up to the individual, and as pointed out by my informant quoted above, it is through one's own practice, as well as one's own preferences and situational interaction with soil and plants, that mekem garen is a process to be apprehended. At this stage in my fieldwork, I could already discern from people's explanations a certain loss of what they knew before but when I accompanied people to their gardens, they did not focus on what had been 'lost' or 'not done' but rather on the fact that their approaches to gardening were characterised by experimentation, trial and error, of combining methods and by a constant drive for innovation. Moreover, once more it is not clear who introduced a certain technique or method – people from Dixon Reef or people from outside the village. Therefore, on the next pages, I will describe the current approaches and methods of gardening as I have come to know them in Dixon Reef. I explore them from two different perspectives, namely diversification and flexibility.

4.5 Moving Gardens and Plants

Diversification of crops and species was identified by Julie Sardos and colleagues as a strategy in Vanuatu horticulture both in the past and today (Sardos et al. 2016). Anette Reenberg et al. identified for people in the Solomon Islands that alteration in livelihood practices, also in agriculture, is a common practice, and people are used to it (Reenberg et al. 2008, 11). Diversification in agriculture, diversification in life and living conditions before and during difficult situations of disaster are also common in the Pacific (Hetzel and Pascht 2019; Le Dé et al. 2018). Diversification is also identified by geographers Reenberg et al. for securing livelihoods in the Pacific:

> Although the 'room for maneuver' for individual households varies (e.g. access to resources such as land and income opportunities), livelihood strategies components have generally become much more diverse. Hence, people have a wider range of options to rely on if hazards occur. The general conclusion is that people on Bellona have been able to alter their activities and become less vulnerable to external shocks in terms of changes in single components of their livelihood conditions—especially environmental but also economic. (Reenberg et al. 2008, 11)

Diversification in agriculture additionally happened over the last centuries through trade (Barrau 1958), European influences (Sardos et al. 2016) and globalisation (Campbell 2014). Cultivation of diverse crops and species is one way of maintaining food security:

> Numerous species of food crops containing several different varieties (or landraces) are planted in an intricately mixed and multi-layered arrangement. This provides protection against the epidemic spread of crop diseases and pests; a fuller utilization of solar radiation and soil nutrients; a phased harvest of different crops over several months, and the production of a variety of foods thus allowing a better diet. (Sardos et al. 2016, 733)

Without dismissing the importance of cultivating different species in one location (polycropping), what I call diversification also consists of the various other ways in which my interlocutors approach cultivation, especially the practice of planting in many different locations. One such method was to follow the sun to higher areas when water filled their garden plots, or to follow the water when other locations dried up. I will describe this by explaining the two procedures

important to the work of my interlocutors: on the one hand, the planting of crops in more than one place, and on the other hand, the cultivation in one place of a variety of crops. I will also elaborate on how new types of plants are part of the approach to agriculture in Dixon Reef, as well as in Oceania.

4.5.1 Gardening in Different Locations

"Many garden plots are always better than one" is what people told me when I asked why they have different small garden plots around the garden area (and not, for example, simply one large garden). The garden area around Dixon Reef, and in many other places around Malekula, starts outside the village. This is the first aspect of diversification – my interlocutors cultivated crops in garden areas around different locations surrounding the village.

The first things I recognised when leaving the village were plantations with their huge coconut trees which were, besides cocoa trees, the only cash crops in the area, processed by hand into copra, and picked up by ships in a bi-monthly routine. In between the coconut trees, a few cattle could be seen grazing around the coconuts on the ground. Reaching the garden, one had to pass roads and thicker bushes. However, suddenly the area opened up into a widespread area where villagers had cut down smaller trees. Only the particularly large ones were left. We were standing in the sun, with no shade in sight. The sun shone on the various plants in their different shades of green; some climbing up, like the yam vines, some crawling on the ground, like pumpkin, and some standing up like manioc, corn or bananas. We reached the garden plots where villagers maintained their mixed gardens; everything was planted in one place, not separating root crops. "This is where we make our gardens", one member of the gardening group of that day, three women and myself, would say the first day I accompanied them, pointing in one direction. I looked and tried to figure out what she meant but only saw a huge area, a sea of different crops. It took me some months to recognise that one planting site merged with that of the neighbour, yet each person knew what each had planted, despite the lack of visible borders. One garden thus joined a whole area of gardens, with permeable boundaries for people to cross, or each community member, or visitors to see what the others were doing, but people took care to always cross with caution so as not to destroy anything.

Horticulturalists in the Dixon Reef area would conduct gardening in areas which formed a route to subsequent gardens, which were planted later. It was usually the case, so I have been told numerous times, that when the first per-

son started their gardening in one area, the next person would follow shortly after. "They all run to the hill and want to make their gardens, after the area was cleared by a big fire", one woman laughed when explaining why a huge area on one of the mountain ranges had been cleared, first by a huge fire and second because people liked the open place and others followed behind. As a result, there were several huge areas where you could see one garden plot next to another. Up on the hill side, next to the river, along the road and in the swamp area, these multiple plots could be found. Not every area was used for cultivation at the same time, but they could rather be cultivated periodically. Since my interlocutors practised their gardening at the time in those areas further away from the village, my interlocutors had to walk long distances. As I will explicate in Chapter 5, it is time-consuming to walk such long distances and so the fact that Dixoners did not concentrate their time and labour in one place (such as home gardens for vegetables) but rather spent a lot of time moving from one garden to the next became a divergent topic of discussion between the NGO and participants in the workshops.

Figure 3: From left to right: Garden on the hill, at the riverside, along the road, in the swamp area

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While discussions about the home gardens still continued in climate change projects, Dixoners decided against permanently working with the soil next to their houses, using soil preparation methods, as explained above. Instead, they walked long distances in order to decide where to transfer their crop seedlings according to weather and soil conditions. There are different words for what is referred to as graon in Bislama, or etene in Novol and Nasarian (soil), which describe how each piece of earth looks. One of the elder men told me that every soil type is good for something, e.g. emen demende (the Novol and Nasarian for marshland) for vegetables and manioc, while some such as etene meramp/merambe (the Novol and Nasarian for soil of bamboo) was not useful for planting but bamboo provided building material for houses.

The soil that surrounds the village's houses was not categorised as soil, since it is too sandy. For that reason, people call it etene emere suan in Novol, which would be translated as 'beach' in English. This soil was, like that where bamboo or coconut trees grow at the beach, not real soil in the eyes of my interlocuters, and thus not made for cultivation. In addition, the ground around the village, up the hills and along the coast has a different quality, as shown by the following explanation by one of the men in Dixon Reef:

> But only when there is no more water in the river, then you plant there. If you go to Langelip [name of a place], there the soil is good, that's real soil, it works well when there's too much sun. But as soon as it rains again, there is too much water and the crops are not good.

Soil and ground cannot be changed, and elder people in Dixon and in other Novol (or Nasarian) speaking areas on Malekula also refer to good soil/ground when they are looking for a good spot to start planting. Good soil/ground can absorb water and is also identified by its colour, which is why it is called etene rup (the Novol and Nasarian for black soil) or etene miele (the Novoland Nasarian for red soil). The quotation above shows that depending on which soil is appropriate at any given moment, it makes sense to look for the soil for the plants depending on the weather conditions. Mekem garen is thus also a matter of choosing which soil is the best at a particular moment.

Walter, Lebot and Sam differentiate between various kinds of gardens in Vanuatu, such as ones with dry land, where people are burning the vegetation, and others with irrigation, as well as many more. Having different styles of garden is a practice common to ni-Vanuatu on different islands (Walter, Lebot and Sam 2007, 34). Barrau describes Melanesian gardens in the 1950s as huge

areas where people had their garden plots, most of them in one area (1958), where they planted food crops in large areas as monoculture, but that they were always interested in supplementing their diet with other vegetables and legumes. These multiple gardens are something which can be found several places in Vanuatu. Maëlle Calandra writes very detailed descriptions of different kinds of gardens and I refer to her research for descriptions of such cultivation gardens, where various plants are grown all year around, so that gardeners are also able to harvest all year round (Calandra 2017, 114). In Siviri, villagers maintained gardens all over the island of Efate, depending on access and where food crops might grow well. The same is true for the gardening praxis of the people around Dixon Reef. All are part of a wider praxis of Melanesian horticulture. In Dixon Reef, people have many garden plots, which they name by associating the cultivated plants with the word garden: the banana garden (Bislama: garen blong banana; Novol/Nasarian: alenge malele), the manioc garden (Bislama: garen blong manioc; Novol/Nasarian: alenge manioc), the yam garden (Bislama: garen blong yam; Novol/Nasarian: alenge etene) and the vegetable garden (Bislama: garen blo ol legume; no equivalent in Novol/Nasarian). People would use these names to identify the first crops planted there, despite the plots ultimately including several species of plants, bananas next to taro and crops like tomato, corn etc. in between – as a result, they are mostly "mixed gardens" (Walter, Lebot and Sam 2007, 34).

Families have several of these gardens, which are located in different areas along the coast, up the hill or in the direction of the next village. These gardening sites are equally distributed throughout the area and bear the names of the sites: Garden on the Mountain, Garden by the River, or more specifically the names of the areas, as named in the Nasarian language, Garden in Langelip (water runs underneath), Garden Wetmur (stones had fallen down), which gives an indication on the soil composition. The number of garden sites one family called their own at the time of my research could be considerable. In my census of the villagers (and all the relatives that were present at this time), I recorded the number of gardens in a household.[8] In the census of January 2017, I let people count their gardens, with each household reporting between 10 and 18 gardens (some also counted the backyard garden). Among these were the yam gardens as the prototype of all gardens, with several divided among the individual family members. Numbers of gardens were not only high because of

8 I define a household as people sharing one kitchen house, which centres around the woman who calls this kitchen hers.

subsequent cultivation over the areas, according to fallow rules of shifting cultivations, but also due to planting in different areas at the same time.

I naïvely asked women and men around Dixon Reef why it was so important to have different gardens, and received a wide variety of answers. One example shows what people mean by having several gardens. Dixoners explained to me that the dry period in 2015 and 2016 meant that they had been forced by circumstances to react and move gardens from one place to another. At that time, banana gardens were located in the higher areas. Bananas supply food all year round, so people expressed their concern when banana trees were not carrying as much fruit as the year before. "The banana shoots had not grown, there were hardly any banana fruits", one villager explained. As a consequence, they moved the gardens to the area next to the river bed, which is usually flooded, and at that time, the soil still stored some moisture. One day, during my daily evening rounds through the kitchen houses, I became caught up in a discussion with one couple about soil and gardening conditions over the past few years. The couple explained how new information became part of their planning for new cultivation areas:

> N: When there is a lot of rain [La Niña], everyone says we should plant on the mountain. Plant your bananas on the mountain, we shouldn't plant on the plain, otherwise the water will destroy everything.
> D: And is that what you did?
> N: Yes, many people did that, and now taro is also being planted on the mountain.
> D: But I have heard that they are mainly cultivated there because there was a fire [which makes the area accessible], or did you do it because a lot of rain was predicted?
> N: We heard about the rain. [His wife intervened:] And then the fire, good for us, that made it easier.

With this they also hinted at the at the ambivalence of further human action, where some fires also exposed more cultivation areas, even though this also meant losing trees and bush areas. Nevertheless, it underlines that strategies of following the water were well known among all villagers. "This is where I plant my vegetables at the moment, because the river is dried up", one of the women explained as she pointed to the dry river bed where she had planted some cabbage and salad. Some weeks during the dry period from May until August, the riverbed had not held any water, the ground broke up, but still un-

derneath the first lighter layer, plants found enough water to grow. "This is because the route of the river still runs underneath the ground", she explained. A few metres further, some other women grew their vegetable gardens right on the shore of the river. At that point, this method still worked, but when the dry time reached its peak, every vegetable garden owner moved into the riverbed.

Women and men would return to their garden plots when they considered it to be the appropriate time to return, either after a fallow time or when the weather conditions were right. They also would refer to the workshops which suggested that this was one strategy to follow. With changing weather conditions, they were told to move up the hill when it was raining too heavily (a period referred to as La Niña) and they were encouraged to return to the plains, closer to the coast, when there had been no rain for a long time. Dixoners insisted that to maintain many gardens was a better strategy than just having one and thus they also used the strategies of the adaptation workshops. What differed was that most of the gardens were grown in several places at the same time, i.e. simultaneously to one another.

Since I wanted to know whether vegetables had been planted in the past, I asked around: "Did your mother have a vegetable garden?". "Yes of course, she planted vegetables." Island cabbage formed an important supplement to the root crops, being part of one of the easy laplap[9] dishes, and over the years other vegetables like cabbage or tomatoes have become very popular. Nowadays vegetables have become even more important in the minds of islanders, largely because of external workshops, which talked about nutrition. Most of the workshops I was aware of combined methods for agriculture with the question of what is best to be cultivated in order to stay healthy. Since the large volume of consumption of imported rice is seen as a growing health problem in Vanuatu, especially in the urban area (Wentworth 2017), NGOs are keen to prevent this in the rural areas. In workshops, the three-kind rule for nutrition was always propagated, which aims to combine nourishment of vitamins with protein sources and starches. Having a vegetable garden was very popular among the women. The more vegetables they had to harvest, the happier they were. They planted various kinds of cabbages, peppers, tomatoes, onions and watermelons alongside island cabbage.

9 A salty, cake-like dish baked in an earth oven, "baked in a fire and transformed into an edible form" (Bolton 2001: 264; cf. Lebot et al. 2015).

4.5.2 Locating Different Plants in one Garden

Monoculture, like other places in the Pacific (Manner and Thaman 2013), is not prevalent around Dixon Reef, except for some areas where people cultivate cash crops like kava (piper methysticum) and peanuts (arachis hypogaea). Many people on the islands have recently become interested in planting kava, since prices across Vanuatu rose during 2018 and 2019 and demand for kava for after-work consumption on the main island of Efate and especially Port Vila continued to rise steadily.

Since on this side of the island of Malekula, access to reliable transport is not easy, people in Dixon mostly follow polycropping methods for their own use. Manner and Thaman point out that horticulture in the Pacific is characterised by constant disintensification, towards the singling out of diversity in order to have less work and only a few crops to care for (Manner and Thaman 2013, 346; Allen 2015). People in the area around Dixon Reef plant different varieties of yam, which they distinguish into the categories of 'yam' and 'round yam'. Round yam is planted by breaking up the soil and pushing the tuber underneath. For all other kinds of yam, which have an elongated shape, a particular sequence of techniques is required to plant it. In the literature, this kind of planting technique is also called the Malekula style of planting (Calandra 2017, 169–71). Dixoners equally complained about losing multiple cultivars of the yam crops. By referring to the bubu (ancestors) and their continuous work of planting yam regularly, they also praised the diversity of yam, some cultivars of which the current residents of Dixon only knew from stories. However, although the number of cultivars of one crop has reduced, the planting of different kinds of plants in their garden plots was still highly valued. In general, the cultivars planted today are those which require less attention. Men and women who still managed to grow different yam in the yam garden, different cultivars of bananas in one place and different types of vegetables in the vegetable garden were admired by their neighbours and other gardeners.

When the yam planting season started, Arno Pascht and I were both in Dixon Reef. We decided to plant our own yam garden after detailed discussions with the villagers. They provided us with an area to work on, surrounded by other new yam gardens. Yam is the first crop to be planted in the new cycle of the garden year, right after klinim (cleaning) and bonem (to burn), there comes the planem of the yam tuber. After we had gone through the first steps of clearing and burning (for detailed description see Calandra 2017, 166), we set about putting the first yam tubers in the ground in one day. Island cab-

bage[10] had already been planted, accompanied by a 'togai' talk that would protect the yam garden. One of the elder men had given us an old yam tuber as planting material, a yam whose leaves should be red. On the day of planting, all the helpers gathered in our garden and were thrilled that we had such a beautiful yam plant, suggesting that we plant it in the middle of the garden. "Oh, how lucky you are to have got this yam. I hope he will give it to me one day", remarked one participant. More men passed and discussed our planting, also bringing different varieties of yam as planting material, which they were happy to share with us.

Figure 4: Yam garden with polycropping of yam, taro and maize

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One afternoon, I went with Augustina, her brothers and her brother's wife to plant a yam garden for her mother. She was going away to work in the southeast of Malekula, taking care of another family, and thus missed the start of the planting cycle. Yam tubers had to be planted from October to the beginning of December, and when people were not present to start new parcels, they gave this task to their next of kin. The group sent me straight away

10 Abelmoschus manihot

to sow maize grains between the yam, because maize and yam are supposed to be planted at the same time. The men loosened the soil with the digging stick, dug the holes with the help of their spades and planted the yam. The women helped and, in the meantime, distributed more seeds and seedlings between the heaped-up planting sites. The result was a round area with evenly-distributed yam vines, and in between, maize, taro and island cabbage. All of the gardeners present that day had attended the adaptation workshops and discussed the programme, and then Augustina explained why polycropping is particularly important:

> Now we do it a bit differently, since [the project coordinator] showed us that you should plant mixed. You plant different things, now it's not like before. Because when the sun is strong now, you plant everything together to help, protect and nourish the soil. So that your garden bears well. As soon as I plant all the (yam), I make tanna soup in the garden.

By referring to tanna soup,[11] she emphasised the importance of mixed cultivation. Furthermore, she emphasised that this practice has changed since workshops have been in place, and thus showed a positive reaction to these ideas. This does not mean that mixed cultivation was not a practice before. Like in other places in Vanuatu (Calandra 2017) and Malekula (Walter, Lebot and Sam 2007), diversification of this kind is an important part of any kind of gardening. When passing the different yam gardens, the leaves of the yam vines were clearly visible. At the same time, the maize would be ready to be harvested, and the ripe yellow and reddish maize cobs would tower over the growing leaves of the taro plants, which usually took a little longer to grow than the yam tubers, and therefore received post-yam banana plants as neighbours.

As scientific climate change projections predict longer periods of drought, yam harvesting is also being considered within the programme. A reduced harvest of yam crops because of, for example, a cyclone destroying the yam plants, would lead to less yam being available as planting material for the next planting season. People were advised by the NGO to multiply in this case the planting material for the next period through the Yam Nursery method (called yam

11 Tanna Soup is a dish from one of the southern islands of Vanuatu, Tanna. Leftovers from the previous days are processed into a kind of soup, which is characterised by a mix of vegetables, pulses and root crops.

minisett).[12] Agnes, an experienced horticulturalist, tried to multiply her yam tubers by cutting them in her garden. She explained in detail how the yam nursery worked. When I asked Agnes whether she saw this as an option for her gardening in the future, she replied: "Now I have seen that my yam grows so well too. But when I see that I am losing too much yam, I have to apply what we learned in the workshop. That is good." People were able to explain in detail what they had learned from whom, but in the end, they also emphasised repeatedly that they had used this knowledge to work out their own procedure in their own garden. "Mi tan tanem little bit" (I change things a little) was the comment I heard the most. Some of the elder people explained a technique whereby they only planted the yam after clearing the place, burning the vegetation and carefully clearing the ground of any leaves and branches. This method was supposed to make the space clean. Passing the yam garden plots and asking around, people explained that they would not follow this practice at the moment. The slash and burn method was, however, widely practiced and was also a point of discussion between the villagers and staff of the NGO, because the latter wanted to stop the burning of organic material all over Vanuatu. People around Dixon Reef continued, but did not burn everything and some leaves were left on the ground. However, ultimately, it was a very individual practice.

4.6 Gardening in Transformation

Sardos et al. have pointed out that horticultural practices in Vanuatu are flexible and always incorporate change, both through different crops and through different gardens. They have called this "[t]he idea of continuity through change and novelty" (Sardos et al. 2016, 734). This is also expressed through being flexible and diversifying plants and places of cultivation. It is a common praxis in Vanuatu to involve changes in gardening methods. Gardening is a practice whose 'tradition' is to renew itself again and again (ibid.). When looking at mekem garen, I learned that women and men in Dixon Reef use the methods received from their bubu (ancestors) as well as those they allocate to other sources, including the various workshops (not only that of the NGO)

12 For the yam minisett, yam tubers are cut into small pieces and pre-grown in a nursery until they are large enough to be moved to the eventual garden site. This technique is used not only in the Pacific region but also in several African countries in order to make enough planting material at times of scarce harvest.

in their gardens. Change and flexibility were common for my interlocutors, and the reference to the bubu gave this legitimacy to continue. Malekula gardening is characterised by the flexibility of changing locations and cultivation methods. When problems arose, such as a lack of rain and thus a shortage of water, the most important strategy was to change the location of gardens. The women moved their vegetable plants along the riverbed or into the riverbed so that cabbage and tomatoes had access to water. Constant cultivation of the soil is only envisaged in this sense when plants were mixed in the yam garden.

Learning cultivation meant for Dixoners to imitate others, passing various gardens (including yam gardens)[13] and thus seeing the work of others, and developing their own techniques by experimentation. When I asked what to do in the garden, people told me that they had their own style of gardening, based on what their parents had told them, what was agreed in the workshops, what was tried out by imitating others and through experimentation. New gardening techniques were added and integrated into the existing network, and some were temporarily introduced. People were open to trying methods introduced in the workshops. However, they would still refer such learning to its source, and did not call this their own method. There is more than one way to approach the gardener and more than one way to practise mekem garen. It became itself a practice of transformation in itself.

The case of the abandoned home gardens, which I presented at the beginning of this chapter, illustrates quite well that women and men around Dixon Reef never refused any 'new' methods, because of their striving for diversification and retaining many options. I have written elsewhere, together with Arno Pascht, that similar strategies have taken place in Siviri, on the main island of Efate, where people strive to include gardening as just one option for their livelihood. In this article, we showed that all of these livelihood strategies undergo constant diversification (Hetzel and Pascht 2019).

People in Dixon Reef who were involved in the project discussed approaches to gardening and the fact that the work of villagers was not continuous. They started working on their small home gardens, using all available methods of soil preparation through kitchen compost, nitrogen fertilisation, etc. as well as minimal irrigation through grey water from the kitchen house.

13 Before, people told me, it would not be possible to visit other people's yam garden plots because they were tabu for members of other lineage groups to enter. Since gardens are now sometimes placed on the road on the way to their own plot, gardening has become visible for everyone.

In stating that they cannot force the soil to do something it does not 'want' to do, they explained one practice of mekem garen, which is characterised by diversification – on the one hand the practice of growing crops in different places and on the other hand cultivating different species and varieties of crops in one place, by finding the appropriate spot at the appropriate time.

Horticulturalists in the Dixon Reef area were happy to learn something new in the climate change workshops, because this means expanding their repertoire of gardening methods and techniques. People were interested in the new aspects of gardening demonstrated in the workshops and applied some of these methods in their individual garden techniques. This is in line with their praxis of learning gardening, because learning mekem garen is about combining all sources available. This is highly valued by people, and furthermore is seen as a necessity to approach good gardening. This praxis of introducing new plants, species and cultivars in Melanesia and Vanuatu is something others have observed as well, today and in the past (Barrau 1958; Lebot and Siméoni 2015, 840; Walter, Lebot and Sam 2007). Lebot and Siméoni have made it clear that communities planting different species are better prepared for environmental change than others, and that it is common praxis in those communities to keep the number of species high (Lebot 1992; Lebot and Siméoni 2015, 839). Diversification has been practised for decades. Calandra describes in her historical sketch how permeable gardening was in Vanuatu over the centuries through various connections to traders, missionaries and seafarers (Calandra 2017, 127–42). However, diversification not only refers to the multiplication of plants, but also to the diversity of methods, the practice of gardening in different places and the constant search for new methods, which also includes flexibility to combine or change methods or to use them only temporarily.

As I have tried to sketch out above, people used new practices but did not follow them in a linear way. Indeed, new techniques, which people are very interested to learn, were applied and reused in their own way. It would be too simple, however, to conclude that people did not feel like doing what they had been 'taught'. People's interest not only shows at the beginning of the encounter with new practices, but also in the fact that aspects are taken up again, for example, when the women started to replant gardens the following year, at other locations and in their own ways. During the drought after the cyclone, villagers were not interested in continuing their work exactly as before, but rather recommenced certain aspects which fitted in with the conditions they found in their gardens. However, the representatives of NGOs had trouble understanding why this would happen, because they were teaching villagers to

use mulching, grey water irrigation and other methods for changes in agriculture that they believed would have resulted in a radical change of cultivation in the future.

In addition to gardening and in order to obtain the necessary money to buy supplementary food, Dixoners spent a considerable amount of time in the plantations in order to harvest coconuts, remove the flesh from the shell and dry it in order to obtain copra, which is then sold to regularly-visiting copra buyers. Another important cash activity is the production of cocoa, which is even more labour-intensive. With very few exceptions, inhabitants of Dixon Reef did not plant kava themselves, but imported it mainly from the Southwest Bay region of Malekula. However, during 2019 a group of people set out for a place further inland where they stayed for some days and planted large amounts of kava. This is, we were told, because the price of kava had risen considerably during the previous couple of years (Hetzel and Pascht 2019).

4.7 Conclusion

Over the time of one garden cycle from the first planting of yam to its harvest, I learned the approaches of cultivating a garden and to follow the principle of diversification of plants and locations across a variety of aspects of gardening. When my interlocutors in Dixon Reef are expanding their repertoire of gardening through the adoption of new techniques, they spread their energy rather than concentrating it on one place or one piece of work. This resulted in moving crops and plants, and moving between different locations. At first interpretation, their approaches to the cultivation of crops and to working in changing circumstances differed from the expectations of those leading the NGO programmes. In the case of the abandoned gardens, these different approaches become a matter of caring for the soil in terms of permaculture and caring as a matter of taking crops to letting the soil show what the needs are, rather than forcing it. People involved in the adaptation programmes did not agree with one another when it came to gardening next to the houses. The important aspect was that the involved parties never had a conversation about approaching gardening itself and how villagers actually do what they call 'gardening'. How gardening is conducted only becomes apparent in the current praxis of people around Dixon Reef. Villagers decided on methods according to circumstances, which could be referred to as 'scripts' that are reworked in praxis (Keck 1998).

Gardening is, at the same time, interaction with what is there, as it is permanently confronted with something new, therefore it has to be flexible.

The background of these events and the frictions between my fellow gardeners and the representatives of the NGOs showed the ontological differences about how to undertake gardening. I have described these differences as ontological friction. While villagers stated that they could not continue working at their home gardens because they could not force the ground or the soil, the staff member of the NGO was convinced that home gardens were possible under all circumstances. However, by seeing this as ontological friction, combining Tsing's emphasis on the creative forces of 'friction' with the ontological approach of Blaser that minds encounters in projects as precisely creating these frictions, I have tried to show that these frictions in adaptation projects have in fact also created something new, aside from the original intentions of the parties concerned. Thereby this also initiated reflections on one's own of practices of gardeners and brought up a new practice fit for the challenges of the Anthropocene. The openness of constant striving to transform practices also integrated this into what Dixoners practise as their own way of gardening.

I have shown how diversifying the gardening practice of women and men in the Dixon Reef area does in fact mean that people continue to do what their bubu (ancestors) did, but often in combination with different sources. This is an important aspect of the praxis of mekem garen in the Dixon Reef area and also in Siviri on Efate. Different approaches to gardening had contributed to disagreement, but also to the use diverse knowing of mekem garen. It is not my intention to judge whether the project worked, or whether villagers learned new techniques for dealing with changes in agriculture. What I have demonstrated is that people in Dixon Reef worked out a praxis based on trying out past instructions, experience and new techniques. Mekem garen is a practice of innovation and diversification, which was continued by people, and that the workshop played an integral part in this. With this, I want to move beyond the dichotomous framing of traditional and modern approaches to gardening. These dichotomies do not do justice to the movements and the changes that are being driven forward. The encounters of people in the workshops and the emerging ontological friction created new gardening techniques and, in a way, all the aspects of the mekem garen that took place afterwards. People in Dixon Reef did not continue the practices they 'learnt' in the workshops, but they developed them further in performing their gardening. In the next chapter, this movement of plants and people will be described further and I intend to show how this therefore becomes a practice of making the environment.