

How is development affecting sustainable livelihoods and disaster risk: A case study of a coastal community in Fiji

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Abstract

The aim of this study was to investigate how development have affected access to sustainable livelihood capitals and how the perceived access to these capitals have changed in the past decades in Dravuwalu, a coastal society in Fiji.

A case study was conducted in the village of Dravuwalu. Data was gathered through semi-structured interviews and observations. The composition of livelihoods at the time of research was compared with how people describe the perceived composition of livelihoods decades ago.

The result show that it is difficult to say with certainty whether Dravuwalu is more or less resilient towards natural hazards now compared to some decades ago. The increase in cash inflow to the village the past few years appears to have a role in the reduced social capital and in the decreased nutritional status. However, it has also made it possible for more villagers to rebuild their houses and install solar panels. Moreover, there is mainly one source of income, which is very vulnerable to natural hazards. There are some signs of the rapid development reducing the resilience in Dravuwalu, as the new lifestyles are more vulnerable than the traditional ones. On the other hand, more access to the outside world and consequently to modern technologies facilitates life in the village. The real challenge with sustainable development in Dravuwalu appears to be to increase one capital without decreasing another. Also, to make sure that all individuals have access to enough capitals to retain a sustainable livelihood, to prevent anyone from falling behind.

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Summary

Several decades ago, many Fijian villages were self-sufficient and traditional living was the norm (Movono, Dahles, and Becken, 2017). However, the recent development has changed the societal structures. This study aims to investigate how development has affected a village in Fiji in terms of its resilience, through a Sustainable Livelihoods Approach. The method is a case study of the village Dravuvalu, using the Sustainable Livelihoods Framework to investigate the change in access to natural-, physical-, financial-, human- and social capital. In the study, the current composition of livelihoods is compared with how villagers describe the perceived composition of livelihoods decades ago. Furthermore, the purpose is to discuss how the change in livelihoods has affected resilience and disaster risk.

The following research question is investigated: *“In what ways has development affected access to sustainable livelihood capitals and how has the perceived access to these capitals changed in the past decades in Dravuvalu, a coastal society in Fiji?”* In order to answer this a case study was conducted in the village of Dravuvalu. The most suitable methodology for the purpose was a case study research, since it enables the combination of methods and data types such as observations and interviews. Semi-structured interviews and observations were held. Different indicators were used to identify the perceived change of access to the livelihood capitals. By studying the perceived recent change in access to sustainable livelihood capitals in Dravuvalu, an analysis of the society’s ability to cope with disruptions was done.

The past decades, the development has affected the access to several livelihood capitals in Dravuvalu. Access to natural and social capital has decreased slightly, while the access to financial capital has increased. Regarding physical and human capital trends are pointing to that some indicators have increased, and others have decreased. The access also varies within the society. Consequently, it is not fully satisfactory to use the Sustainable Livelihood Framework to determine whether Dravuvalu has become more resilient or not. However, trends found in this study and in comparable studies (Becker, 2017; Sofer, 2015) indicates that there is a significant change in the village which can be described by the sustainable livelihood capitals and that this change have affected the resilience.

This study shows that access to some capitals have decreased due to development, which indicates that there is a possibility that the resilience in the village has decreased. The reason could be the more complex structure of the village due to the dependency on for example money and governmental aid but also to shifts in the access to capitals. For example, the village used to repair and rebuild their houses (traditional bure’s) with materials found in their surroundings, they used to sustain their needs for food and water from their surroundings, and they were consequently not very affected by events outside of their village. Today, the village need concrete and other building materials to repair a house and they buy food from outside of the village. To pay for this they need an income from outside of the village. However, perhaps it is not possible to keep the independence while also gaining access to modern technologies that aids in getting a more facilitated life. The world is not the same now as it used to be, and development and technology comes with both disadvantages and benefits.

Increase in trade income from selling yaqona appears to have had a role in the reduced social capital and in the decreased nutritional status. However, it has also made it possible for more villagers to renovate their houses and install solar panels. Moreover, it is potentially problematic that yaqona is the main source of income as its market value varies greatly, making it a vulnerable income.

The goal for cities and villages all over the world should be to sustain the access to all capitals while increase access the capitals that they lack. The accessibility to capitals should be shared among all groups in the societies in order to be sustainable.

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Glossary

Bure - Traditional Fijian house made of wood and leaves.

Cassava - A large edible root.

Dalo - An edible root also known as taro.

Dravuvalu - The Fijian village where this study is conducted.

Kadavu - The island Dravuvalu is located on.

Keni - A cyclone that hit Kadavu in 2016.

Kerekere - Fijian custom in which a relative or neighbour ask for some kind of help and that help is given without any expectancy of getting anything in return.

Mataqali - Fijian clans.

SLA - The Sustainable Livelihoods Approach.

SLF - The Sustainable Livelihoods Framework.

SIDS - Small island developing states.

Suva - The capital of Fiji.

Tokatoka - Extended family.

Viti Levu - The main island in Fiji.

Vunisea - The main village in the island of Kadavu.

Yaqona - A root with high cultural value in Fiji

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1 Introduction

1.1 A changing world

The world is changing. The climate is changing, and consequently heat waves, floods, cyclones, wildfires and other climate-related extremes are getting more common and more severe in many places of the world (IPCC, 2014). At the moment there are about 100 000 species all over the world that are at risk of getting extinct due to climate change and other changes in their environment (IUCN, 2017). If climate change-induced events are not thoroughly understood and accounted for, they may lead to disruptions in food production and water supply, as well as effects on infrastructure and human well being (IPCC, 2014).

Although many believe that the world is getting worse in several ways, one should have in mind that statistics show that the world is in fact getting better (Rosling, Rosling, and Rosling, 2018). For example, the death toll for natural disasters has fallen to less than half of what it was 100 years ago (ibid.). According to United Nations (2017), the global population that had access to electricity increased from 77.6 % to 85.3 % from 2000 to 2014. In 2015, 71 % of the global population had access to "safely managed" drinking water services and 39 % had access to "safely managed" sanitation service (ibid.). Furthermore, the United Nations measured that in year 2000, only 7 % of the global population had access to the Internet compared to 44 % in 2015.

1.2 Small Island Developing States

Small island developing states (SIDS) have been designated to be particularly vulnerable to natural hazards and extreme weather events (Wong, 2011). Climate change puts the SIDS under exacerbated pressure as the risks increase for sea level rise, cyclones, higher air and sea surface temperatures, and changing rainfall patterns (Nurse et al., 2014). In addition to this, SIDS are at risk of reduced adaptive capacity and ecosystem services which are critical to lives and livelihoods in small islands (ibid.). Furthermore, many of the SIDS share characteristics such as: high population density, limited land resources, small size, limited funds and human resources, threatened biodiversity and high dependency on tourism (Wong, 2011), which presumably affect both their vulnerability to natural disasters and their development.

Although most of the world is adjusting to a more modern lifestyle by getting access to electricity and clean water in their homes, Internet, TV and other modern technologies, Oceania (in this case excluding Australia and New Zealand) is moving relatively slow towards development in these measurements. In Oceania, the amount of people having access to Internet has increased from 1.8 % to 17 % of the total population between year 2000 and 2015. Despite this, 27.2 % of the population in Oceania were living below 1.9 dollars a day in 2013 (United Nations, 2017). Oceania also has the highest rates of remittances in the world (7.3 % compared to the average in the world - 0.8 % in 2015) (ibid.).

Furthermore, Oceania has major health problems. Overweight and stunting growth (low height for their age) are very common. 9.6 % of children under the

age of five were overweight and 38.2 % were stunted in 2016 (United Nations, 2017). One explanation that have been identified is the introduction to more unhealthy western food with high fat and sugar content (Secretariat of the Pacific Community, 2002).

One could say that some villages in developing countries are now in a stage where they can either embrace a more western lifestyle or keep living the traditional way. However, for many villages in the Pacific islands it is not entirely in their own hands whether they want to adapt to a more western lifestyle or not. Conell (2010) mentions “the tyranny of distance” as a significant disadvantage for small islands. Transportation costs are high, and this isolates people and businesses in remote villages from the central markets, making both exporting and importing products more challenging (ibid.). Furthermore, even if the villagers are both willing and able to pay for the transport, the communications to and from the central markets are not regular enough or have enough capacity to sustain some businesses. Nevertheless, even if the poor societies in distant islands have gained the possibility to adapt to a more western lifestyle, there is a question of if they should. It is important to remember that just because a culture is different than another, that does not necessarily mean that one culture is better than the other.

1.3 Fiji as a country of interest

Several decades ago, many Fijian villages were self-sufficient and traditional living was the norm (Movono, Dahles, and Becken, 2017). However, the recent development has changed the societal structures in several places and many villages are constantly getting more modern (ibid.). In order to purchase modern technology, it is obvious that the villages must get more connected to the outside world. This is resulting in both increasing wealth and poverty and leads to a transformation in disaster risk when the development is not spread evenly (Becker, 2017).

Fiji has a GDP of about 5 billion USD (2017) and is therefore one of the most economically developed countries of the Pacific island economies (PIEs) (World Bank, 2018). It is rich in natural resources but also, like most of the PIEs, it is constrained by its remoteness through high transportation costs, vulnerability to adverse weather and the limited size of domestic markets (IMF, 1995). Since Fiji is a country that is highly affected by climate change and many villages are still living traditionally, it is of great importance that its development is steered into a resilient pathway (UNFCCC, n.d. Sofer, 2015). The country has been highly affected by natural disasters but also by the recent development, which makes this a good place to investigate the connection between sustainable livelihoods, development and disaster risk (IMF, 1995).

1.4 The Sustainable Livelihoods Approach

In order to understand how the development has affected disaster risk in a coastal community in Fiji, one approach is to investigate the change in sustainable livelihoods over time. DFID (1999) describes the Sustainable Livelihoods Framework as a framework that can be used for analysing the livelihoods of

developing societies. The framework uses five types of capitals to describe livelihoods; natural, financial, human, social and physical capital. The concept of sustainable livelihoods has proven useful as a micro-level complement to macro-level structural approaches to development, by focusing on human agency and inequalities and the distribution of assets and power within a society (Chambers and Conway, 1991; Paudel et al., 2017). Furthermore, a Sustainable Livelihood Approach has been widely applied in relation to vulnerability and disaster risk (Gaillard et al., 2009).

A study made by Twigg (2001) investigated sustainable livelihoods in relation to vulnerability to disasters. The paper comments on livelihood options for disaster risk reduction and was commissioned by the Disaster Mitigation Institute (DMI) as a part of the larger project - "Livelihood Options for Disaster Risk Reduction in South Asia" (Twigg, 2001; Nivaran, 2005). Twigg (2001) concluded that the Sustainable Livelihoods Approach was preferable for investigating livelihood options for disaster risk reduction and that participation of vulnerable people in the study is essential for a good result. Additionally, Twigg (ibid.) investigated the impacts disasters have had on livelihoods and Nivaran (2005) has through his report linked disaster management issues with sustainable livelihoods. The Sustainable Livelihoods Approach is believed to be suitable for investigating how development alters disaster risk by affecting people's access to the different capitals and therefore the approach is chosen for this study.

1.5 Purpose and Research Question

The purpose of the study is to investigate how development has affected a village in Fiji in terms of its resilience, through the Sustainable Livelihoods Approach. More specifically, to make a case study of the village Dravuvalu, using the Sustainable Livelihoods Framework to investigate the change in access to natural-, physical-, financial-, human- and social capital. In the study, the current composition of livelihoods is compared with how people describe the perceived composition of livelihoods decades ago. Furthermore, the purpose is to discuss how the change in livelihoods has affected resilience and disaster risk.

The following research question is investigated:

"In what ways has development affected access to sustainable livelihood capitals and how has the perceived access to these capitals changed in the past decades in Dravuvalu, a coastal society in Fiji?"

1.6 Limitations and Disclaimers

First of all, it is important to emphasize that the study discusses how development affects resilience in the village of Dravuvalu and consequently one should not blindly assume that the results from this study could be applicable to other Fijian villages or to other villages around the world. However, it can be used as a complement to other studies in order to discuss development and resilience at a larger scale. Furthermore, the field study was conducted only weeks after a category 3 cyclone had hit Kadavu island. It can therefore be argued that the village was not in a normal state when the study was conducted, but as

Dravuwalu did not suffer any major damages and the researchers were aware of the cyclone it is not believed to have had any substantial effect on the study.

2 Theoretical Framework

In this section the theoretical framework used to answer the research question is presented.

2.1 Development

Development was at first focused on income as a measure of well-being (Barder, 2012). This has changed to involve more aspects such as health, education and living standards (ibid.). It is also argued that development is not just an improvement of well-being but also a sustainable, long-term concept which includes economic, political and social systems (ibid.).

Cambridge dictionary about development (Cambridge Academic Content Dictionary, n.d.):

"The process in which someone or something grows or changes and becomes more advanced."

Sustainable development, according to the United Nations (General Assembly of the United Nations, n.d.):

"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"

2.2 Vulnerability and resilience

As mentioned earlier the purpose of the study is to understand whether the change in access to capitals have either lowered or strengthened the resilience of the village, i.e. if the village has become more or less vulnerable to disasters. In order to study this, one must first identify what vulnerability is. Wisner et al. (2003) offers a simple but relevant definition of vulnerability towards natural hazards:

"the characteristics of a person or group and their situation that influence their capacity to anticipate, cope with, resist and recover from the impact of a natural hazard (an extreme natural event or process)."

This involves a combination of factors that determine the degree of which an event puts someone's, for example, life, property or livelihood at risk (ibid.).

Furthermore, Wisner et al. (ibid.) mentions one definition of resilience:

"The measure of the rate of recovery from a stressful experience, reflecting the social capacity to absorb and recover from the occurrence of a hazardous event."

Vulnerability however stands in relation to a threat and there are different kinds of vulnerability. Without a threat, someone or something cannot be vulnerable.

In this report the identified and analysed threat is natural disasters, such as cyclones, storms, landslides and flash floods. Vulnerability is here defined as not being resilient, thus not being able to cope and recover from such an event.

2.3 Sustainable livelihoods

The Sustainable Livelihoods usually includes natural, financial, human, social and physical capital. These are described in the following chapter.

2.3.1 Natural capital

Scoones (1998) refers to natural capital as the resources of nature such as stocks from soil, water and air. This also includes environmental services like pollution and the hydrological cycle. Natural capital is very important to those who rely their livelihoods on resource-based activities such as farming and fishing but also, humans cannot survive without food produced from natural capital (DFID, 1999). However, this is not the only reason why natural capital is important. Poor air quality decreases the health of humans and in turns affects human capital, which could affect the access to other capitals (ibid.).

To analyse natural capital, issues such as which groups have access to which types of natural resources, what the nature of access rights are, how secure they are and how they are defended can be investigated (ibid.).

2.3.2 Physical capital

Scoones (1998) refers to the capitals "natural", "financial", "human" and "social" capital when discussing sustainable livelihoods. DFID (1999) added physical capital after the introduction of the pentagon approach to sustainable livelihoods by Carney (1998).

Physical capital is the infrastructure needed to support livelihoods for example; affordable transport, secure shelter and buildings, water supply and sanitation, affordable energy and access to information/communication (DFID, 1999).

The lack of some types of infrastructure has been found to be a core dimension of poverty (ibid.). Without access to services such as water or energy it is likely that human health will be affected. Also, poor infrastructure can preclude education, income and health if it hinders people to transport either themselves or supplies to, or from one place to another (ibid.).

Sometimes there are infrastructures available in societies but only some have actual access to it. When analysing physical capital, this is one important matter. Also, the infrastructure needs to support a service (for example the school building cannot be used as a school without teachers) and it needs to be appropriate, thus, meet the needs of the users in long term.

2.3.3 Financial capital

Scoones (1998) also identified the financial capital as one of the sustainable livelihood capitals, and it can be defined as the capital base - for example cash,

credit, debt and savings. These can be divided into two main sources of financial capital: Available stocks (for example savings, cash and jewellery) and regular inflows of money (ex. earned income and pensions) (DFID, 1999).

Financial capital can be converted into other types of capital and can be used directly to get food or health care and can in some circumstances even be transformed into political influence (ibid.). Not surprisingly, this capital tends to be the least available capital to the poor, which in turn results in a lack of other capitals (ibid.).

When analysing financial capital, it is of importance to understand who and which groups that have access to which assets and how (ibid.). Also, other factors that might be of importance are remittances and other types of income and how reliable they are and how they are transmitted and vary (ibid.). Another indicator is how savings are kept and how safe the options are (ibid.).

2.3.4 Human capital

Human capital is according to Scoones (1998) the knowledge, skills and the ability to labour, which include good health and physical capability. This asset is necessary to make use of other types of assets (DFID, 1999). It can also be improved by gaining access to other capitals such as education and health care and by developing relevant skills and knowledge. Often, higher income is reinvested in education and a good health is directly related to both food and income security (ibid.).

Indications of human capital could be for example life expectancy, nourishment, education level (how many years children go to school) but also if the knowledge is useful and the level of local knowledge. If one is making a sustainable livelihoods assessment at the local level of a society it is also important to investigate if there are variations in access to different indicators within the society (ibid.).

2.3.5 Social capital

Scoones (1998) further describes social capital as the networks, affiliations, social relations and social claims in a society which people can make value of. This is a special trust that the people have in groups or relationships to the community they live in and which lower the cost of working together (DFID, 1999). Social capital has direct impacts on other types of capitals through reducing "free rider" problems, facilitate innovations and sharing knowledge, and studies have shown that by improving the efficiency of economic relations, people's incomes and rates of savings can increase (ibid.). Having access to social capital aids a community in case of disasters. Villagers can assist and share knowledge with each other before an incoming event and while waiting for aid from outside, the social capital can help a community to hold its own (Sanyal and Routray, 2016).

However, those who are excluded from the social networks could have a huge disadvantage, for example women in many cultures or people with lower status (DFID, 1999). Also, many networks are based upon hierarchical relationships,

which makes it harder for people to move upwards from poverty. On the other hand, being a representative of a network or group often also entails obligations, which means that a "member" might feel responsibility to assist another "member" even if the times are difficult (DFID, 1999).

In order to improve social capital of the poor, leadership and management of groups can be improved and links between local groups can be extended. DFID (ibid.) also mentions that a more open policy environment can aid in building social capital of the poor. This could probably bring forth questions of the society that otherwise would not be dared to be mentioned.

In order to analyse social capital, one should not be blinded by counting the number of registered groups in a community but rather who has access to which group and who is excluded (ibid.). Another indicator could be how people would cope in crisis and how much they rely on social resources (ibid.).

2.3.6 Combination of capitals

Some links and connections between capitals have been mentioned in the content above. Scoones (1998) have also brought up sequencing, substitution and clustering. From his paper it can be understood that sequencing is if one type of livelihood resource is essential for gaining access to others. Furthermore, clustering is that if you have access to one type of capital, you might automatically have access to others and substitution is if one capital could be substituted for others.

DFID (1999) have found that high level of social capital can add to human capital since knowledge is shared between people or groups. Also, social capital can compensate for an absence of other capitals by, for example sharing labour groups when human capital is lacking. As mentioned before, financial capital is often re-invested in other capitals but is not necessarily vital for other capitals (ibid.). Scoones (1998) calls the combination of activities for livelihood strategies "livelihood portfolios". These can be highly specialised or diverse.

2.3.7 Criticisms concerning Sustainable Livelihoods Approach

"The Sustainable Livelihoods Framework" (SLF) is a tool for analysing the shifts of livelihood and is often used mutually as "The Sustainable Livelihoods Approach" (SLA). However, the latter does not necessarily incorporate the use of the Sustainable Livelihoods Framework (McLean, 2015). McLean (ibid.) called the SLA a "pentagon prison", referring to the "strict adherence to the central part of the SLF" and states that much of the criticism of the SLA are for the inflexibility that arise from this. Furthermore, McLean (ibid.) claims that critique also have been towards the inability to address embedded power relations and for the SLA's perceived rigidity. She argues that this can be avoided by complementing the SLA with "nuanced history research".

Another point that complicates the framework is that it might be possible to find indicators in theory that are difficult to understand and analyse in a real situation (Krantz, 2001). Each village, community, family and person is unique

and it is therefore important that the local people are involved in the analysis (Krantz, 2001).

There is also a problem with reaching and covering the thoughts and perceptions of everyone in a village. Often, sustainable livelihood approaches use "household" as the basic unit of analysis which means that women might not be well represented, and if they are, there is a risk that the women that are heard are empowered and not the poor and vulnerable (ibid.). Krantz (ibid.) also mentions that by using the household as a basic unit, everyone in the household will not have a say in questions of their vulnerability and perceptions. This results in an incomplete analysis.

However, knowing about these deficiencies decreases the risk of coming to the wrong conclusions while using SLF as a tool to study a society. Consequently, it is concluded to be an appropriate method for this paper since only one, small village are investigated and since the methodology used is a case-study where the data can be cross-checked between different sources.

3 Methodology

The case study in Dravuwalu was based on data from a combination of semi-structured interviews in focus groups and individual interviews and observations. This combination of data collecting allows cross checking of data, which gives more credibility to the study. Also, there is limited information available about the specific village that was investigated, and thus a study on site was necessary. Consequently, a case study fitted the purpose well since this made it possible to investigate what the native population are thinking and how they are living, which is not possible to gain knowledge about without personal contact through interviews. The interviews were held in a semi-structured manner in order to get a more relaxed conversation and to allow the interviewees to speak freely without being constrained by specific questions. This enabled the interviewees to give information that the researchers perhaps would not have thought of asking for. All information that was gathered in the study was fitted into the indicators for sustainable livelihoods presented in Table 1, and these indicators were constructed based on the work of Becker (2017).

The Fijian government recently decided that all research conducted in Fijian villages should have ethical approval. Therefore, all participants in the interviews, the interpreters and the researchers had to sign a consent-paper constructed by the researchers. The interpreters had to, by signing this paper, promise to not share the information that were gathered during the interviews and to do his or her best to translate as correctly as possible. The interviewees signed a consent-form that said that they could stop the interview whenever they like or avoid answering a question without giving a reason to this choice. They would be anonymous in the report and if the interview were made in a focus group, they should not share the information given by other interviewees.

3.1 Observation study and informal interviews

A major part of the data collection consisted of informal interviews and observations. Since a part of the study was to observe and to understand how the community worked, it was very helpful to simply walk around in the village, follow the villagers through their daily life and observe. Furthermore, more structured observations were performed by making transect-walks through the village, where the status of the infrastructure and houses were captured with photographs. The quality of the houses was estimated as either "poor", "regular" or "good". "Poor" houses had visible flaws in walls or in the roof, "regular" houses had only smaller flaws that were only noticed if taking a closer look and "good" houses were houses where flaws could not be found. In order to get an overview of where the most vulnerable people live and why, some effort was put into mapping the village. While making the transect walks, small interviews were held with the residents of each house, where questions were asked regarding household composition, what they do, which mataqali (clan) and tokatoka (extended family) they belong to and how old the house is. Moreover, questions regarding the households' access to electricity, water, sanitation, radio, TV and Internet were asked. Questions regarding previous floods were also asked, in order to get an estimation of how often the rivers flooded and what the consequences were.

3.2 Interviews with key informants

Four semi-structured interviews were held with key informants, focusing on the overall access to livelihood assets and infrastructure in the village. More specifically, one interview was held with the village chief, one with the village nurse, one with the teachers and head teacher at the primary school and one with the village pastor. These people were chosen to be interviewed because they were expected to have adequate knowledge about the village and its societal functions and to have some expertise knowledge about some specific livelihood assets. These interviews intended to make it possible to determine access to sustainable livelihoods through the indicators shown in Table 1, which is why the interviews were steered into discussions around the indicators. Part of the purpose of the study is to find out how the community works and how it has changed the past decades, which is why questions about the social and spatial setup of the communities were asked, together with questions of how the community functioned in the past. The interviews with the key informants lasted on average one hour and they were captured by written notes.

Table 1: The indicators that were covered in the semi-structured interviews (Becker, 2017).

<i>Capital</i>	<i>Qualitative indicators</i>
Natural	<i>Access to land and sea</i> <i>Vegetation coverage</i> <i>Natural beauty and wildlife</i> <i>Natural protection</i>
Physical	<i>Quality of housing</i> <i>Access to: boats and transport, infrastructure, electricity, water, sanitation and waste management, telephone, radio and TV, shops and markets, physical protection.</i>
Financial	<i>Paid labour</i> <i>Trade income</i> <i>Capital income</i> <i>Remittances or redistribution</i> <i>Access to credit</i>
Human	<i>Access to health care and education</i> <i>Nutritional status</i>
Social	<i>Household composition</i> <i>Community decision-making and projects</i> <i>Community groups</i> <i>Reciprocal behaviour and community cohesion</i> <i>Social protection</i>

The indicators in Table 1 was mainly covered through open questions such as: “describe your life in the village during a month”. When an interviewee touched upon one or several indicators more specific follow-up questions were asked. This was an on-going process and as each person’s story developed, more and more of the indicators presented in Table 1 were covered. If an indicator of a capital did not get mentioned, the conversation was led into that direction by the interviewers.

When elders were interviewed, they were asked to describe the village when they were younger. Furthermore, they were asked questions about what they believed to have changed in the village during their lifetime. They were also asked to describe how they used to handle (in terms of preparation, mitigation and the management during the event) natural disasters such as cyclones and if this is changed now.

3.3 Interviews with focus groups

Furthermore, semi-structured interviews with four focus groups were held. The focus groups were constructed of five community members from different mataqalis (clans). Two of the focus groups were constructed with only men, where one

group were men aged 20-50 and the other group were men older than 50. The remaining two focus groups were constructed in a similar manner, with the main difference that all participants were women. The separation between men and women were made in order to eliminate the risk that one gender spoke more freely than the other when both genders were present, and in order to open the possibility to compare access to livelihoods between genders. Similarly to the interviews with the key informants the interviewees were asked to describe their life in the community during a month. These interviews focused on mapping the spatial and social setup of the communities as well as the overall access to livelihood assets and infrastructure. The focus groups were also asked questions regarding a wide range of issues, such as decision-making mechanisms in the community and access to medical care, which are all related to sustainable livelihoods. The interviews with the focus groups lasted on average 2 hours and they were captured by written notes.

When the on-site case study was finished the information was analysed. The collected information together with some external literature were used in order to link the data to how vulnerable the community is to disaster risk and how it has changed as a result of the recent development.

4 Results

In this section the results of the case study are presented. Figure 1 shows a map of Dravuwalu village and the two rivers flowing through the village can be seen. The blue houses are habitable houses and the yellow houses are communal buildings, where the biggest is the church and the second biggest is the community hall. At the bottom left corner, the ocean is visible.

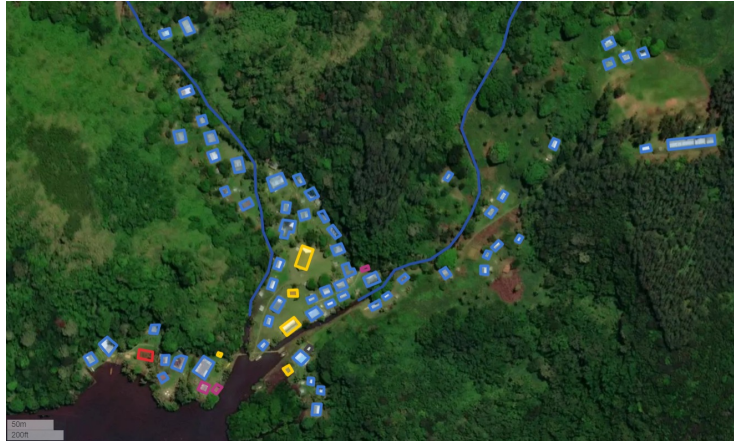


Figure 1: A map of Dravuwalu and the houses that makes up the village.

In order to answer the research question a case study was conducted in the village of Dravuwalu. Dravuwalu is a small village located on the island of Kadavu, which in turn is located about 7 hours by boat from Viti Levu, the main island of Fiji, (Sofer, 2009). Kadavu is a volcanic, mountainous island

where only small parts of the island consist of low level mangrove swamps, beaches and alluvial flats (Sofer, 1985). As a result of the steep mountainsides and the poor infrastructure, almost all settlements are located by the sea and are only accessible by small boats (ibid.).

4.1 Access to natural capital

Natural capital is the access to natural resources for example farmland and natural beauty. In the following chapter, access to the land and sea and natural protection will be considered as well as vegetation coverage and natural beauty and wildlife.

4.1.1 Access to farmland

All families in the village have access to farmland that was distributed a long time ago to the different mataqali by the village chief. The interviewees say that today, the village chief does not normally have to distribute the land since each mataqali already owns a large enough area of farmland to sustain their needs. Land rights are closely linked to mataqali membership everyone who is a member of one of the village mataqali has access to farmland. This system has been in place for a long time and has not changed with the recent development. Most farms are located at least one hour walking time from the village, and are thus only directly accessible to people with a relatively good physique.

The only way to become a member of a mataqali is either to be born into one or marry into one. Traditionally it is the woman moving to her new husband's village and becoming a member of her husband's mataqali and tokatoka. By marrying into a family, she will have access to the family farmland. Additionally, whenever a newcomer arrives at the village (for example a teacher), they can ask the chief for the right to farm some land and it will be given to them. The newcomer will also be allocated a mataqali by the chief for the time they live in the village, and the newcomer is given rights to use land belonging to that mataqali. They will not however become a true member of the village, despite living and working there.

According to several interviewees the farms are larger now compared to before, since they have expanded during the years. But other than that, the access to farmland remains relatively unchanged, since everyone in the village has access to farmland now as well as before. All respondents say that they still farm enough food for subsistence, but they do not sell or exchange other crops than yaqona.

4.1.2 Access to fishing areas

Regarding access to fishing grounds, people from the village do not need fishing permissions from the government since they do not fish in greater extent. Only larger fishing boats need permission. However, it was mentioned that the fishing methods have changed quite drastically since a couple of decades ago, partly because WWF and other organisations asked the villagers not to use the traditional fishing methods. According to some villagers, one traditional fishing

method was to make a massive net from leaves that was put in the water around a reef and then pulled together as a trap, catching all fish within the net. This resulted in the fishermen catching and killing more fish than they could eat and take care of, which had a negative effect on the fish populations as the reefs are breeding grounds for many species. Today the villagers fished using fishing nets that were bought in shops, fishing lines with hooks or using their hands. This has resulted in smaller catches of fish, but most villagers are still satisfied with the amount of fish they catch now.

There is a restricted geographical area for the villagers to fish within, which were decided together with surrounding villages a long time ago. Each village has its own fishing area, but it is possible for someone in the village to ask permission from another village to fish in their area. This geographical fishing area has been the same for several decades.

Fishing is performed by all households, but to different degrees. In the past it was mainly people from the fishing mataqali Naiboletaki that did the fishing for community gatherings. This is not the case anymore and people from all mataqali do the fishing. Both men and women go fishing, but generally they fish using different methods. It is more common for the men to fish from boats and the women from the shore. The families that are boat owners have easier access to fishing areas far from the shore, although everyone can come with the boat owner on a fishing trip, at least if they help paying for fuel.

4.1.3 Vegetation coverage

The vegetation around the village has, according to some respondents, changed slightly during the recent decades. It is observed that the hills surrounding Dravuwalu are green and covered with trees and plants, despite the damage by cyclone Keni in April 2018. However, some villagers claim that the species have changed during the recent decades. They recall that there used to be more fruit trees and larger tree species before, which they used to make canoes and the traditional "bure" (house). One respondent believes that the decline in larger trees is the result of the villagers cutting down too many trees, and vegetation have been burnt down to make room for smaller plantations in the village and that they use vegetation for firewood. Another respondent believes that climate change is the main reason of the perceived decline in large trees.

4.1.4 Natural beauty, wildlife and protection

The village is, both according to the researchers, inhabitants in the village and other visitors very beautiful with its green surroundings, hills, and the ocean. However, the village was littered with plastics from snack-packaging such as candy and crisp bags and also from cans and other rubbish. This could be seen both on the ground, in the river and the ocean and did make the environment a bit less beautiful. The hills around Dravuwalu give some shelter from strong winds and the reef outside the shallow bay lowers the risk of damage in case of a tsunami. Also, the bushes and trees that cover the hills can act as a protection against landslides by binding the soil to the ground by its roots.

4.2 Access to physical capital

Physical capital is the infrastructure in the village. The indicators used in this study is for example the quality of housing, access to boats, electricity, sanitation, waste management, telephone, radio, shops, markets and physical protection.

4.2.1 Access to water

The village gets its freshwater from a tank that is connected to a pump and the water is collected in a dam in the mountains. There is no purification of the water, but all villagers have access to tap water either in their house or just outside it. However, after a cyclone or another disruption, the villagers normally boil the water to avoid contamination. The water pipes break occasionally and when they do the villagers usually collect rainwater for cooking and use river water to flush their toilets until the pipes are fixed. Considering that this system of distributing fresh water was introduced to the village several decades ago it is considered to be unchanged during the recent development.

4.2.2 Access to sanitation and waste management

All households have access to water closets, either in the house or in a shed close to the house. The waste from the toilets is collected in septic tanks that are in the ground. One interviewee claimed that when the septic tanks are full, they normally add one more septic tank beside the first one and connected them to each other. Another interviewee claimed that they empty the septic tank into the river when it is full. This system has been in place for several decades and appears to be relatively unaffected by the recent development.

There is currently no organized waste management in the village and all respondents say that each household either burn or bury their waste. Despite this, there is a lot of garbage in the form of pet bottles, candy wrappings and canned food containers on the ground all over the village so it does not appear to be a collective system for waste management. However, they do a communal cleaning in the village at least once a month. It is the chief and the elders that decide what should be done during the communal cleaning and who should do what.

4.2.3 Quality of housing

There are about 50 inhabited houses in the village where about 27 % are in "good" condition, 45 % are in "regular" condition and 29 % are in "poor" condition. Poor condition houses are houses with obvious visible flaws such as broken or mouldy parts of the walls or roofs. Regular houses have some small flaws but not too visible and the good houses have no visible flaws. About 9 % of the houses are made of wood, 57 % of concrete, 25% of tin and 9 % have mixed materials.

As can be seen in Table 2 below, the proportion of concrete and mix-material houses have increased, and the wood and tin/iron houses have decreased compared to Becker (2017).

Table 2: Difference in building materials in houses in Dravuwalu 2009 (Becker, 2017) compared to 2018.

Building material	2018	2009 (Becker (2017))
concrete	57%	43%
wood	9%	22%
tin/iron	25%	29%
mix	9%	3%

More than 50 % of the houses are slightly elevated from the ground and held up by poles or bricks, allowing water to flow under the house in case of a flooding. Four houses are destroyed by cyclones and not repaired, eight houses are empty, four of them due to that the families have moved either to Suva - the capital of Fiji - or to other villages.

4.2.4 Access to boats and transport

There are seven small boats in the village, of which one is co-owned between two households. All boats are quite similar; they are small boats with heavy outboard engines. If someone that does not own a boat by them self need to go to another village or to the main island, they must pay the owner of the boat for the diesel. This is different from only a couple of years ago when people could get a ride without paying. Going by boat is the by far easiest way to get to other villages, as there is no road leading to Dravuwalu. However, there might be a road to Dravuwalu in the future as there have been petitions of this and it has been brought up to the government, according to one respondent. If someone wants to go to the main island Viti Levu, there are two weekly departures of the ferry going from Vunisea (Kadavu) to Suva (Viti Levu).

4.2.5 Access to electricity

The village have a diesel generator that is operating about two hours every evening, providing electricity to all houses. Several respondents claim that the fuel for the generator is currently donated by a relative to the village chief, so whenever they run out of diesel, they make a phone call and the relative sends more diesel. One respondent, however, claim that the chief collects money from everyone at the monthly meeting and then proceed to buy diesel with the collected money. There has been a diesel generator in the village for several decades now. The more senior respondents added that the introduction of electricity have changed their lifestyle. For example, the women are saving a lot of time since it is possible to wash clothes in washing machines and to cook bread in electric ovens.

Solar panels were introduced to the village in 2015 and so far, ten households have solar panels (two households use the same solar panels) which are 22% of the households in the village, see Table 3. Some households had both solar lights and solar panels and the capacity of the batteries that were driven by these varied.

According to some interviewees, the government is planning on "donating" solar panels to all houses in the village and the villagers would only have to pay a monthly fare for these, instead of paying the installation cost. This was done in a neighbouring village in 2015 according to one source in the village. Only a few of the houses with solar panels have enough capacity in their batteries to keep for example a freezer going, and the electricity from the solar panels are mainly used for lamps in the house.

Table 3: Division of households that have access to solar panels and smaller solar lights.

<i>Households which had access to:</i>	Amount	Percentage
<i>Solar panels</i>	10	22%
<i>Smaller solar lights</i>	32	71%

The introduction of solar panels and smaller solar lights is something all respondents approve of, since solar lights illuminates more of the dark than the oil lamps used before. This is making it easier to read and study during the evenings, which is helpful for the school children. Some of the senior respondents also mention that they feel safer walking around in the house or in the village in the evenings now, as they can see where they are walking and have less fear of stumbling. Many households also use electricity for TV's, laundry machines and electrical ovens.

4.2.6 Access to TV, radio and phone

All interviewees say that more people have access to Internet now than before. The 3G coverage in Dravuwalu appears to be relatively stable. According to one respondent the cell tower providing coverage in Dravuwalu was built around 5-10 years ago. Before that tower was built, the villagers had to rely on landline phones or a com-radio that was used to communicate with someone in Vunisea, who in turn used a land-line phone to call whomever the villager wanted to speak to and then acted as a middleman in the conversation. In recent years people have invested in mobile phones, and there is currently no working land-line phone in Dravuwalu. Several respondents mention that they can follow the movements of cyclones by checking the live-updated path it takes online, making it easier to prepare in case a cyclone is heading in their direction. However, most people still get the information of incoming cyclones and other natural disasters from TV, radio or by phone calls from relatives. The amount of people in Dravuwalu that have direct access to TV, radio and mobile phones are shown in Table 4 below.

Table 4: Division of households that have direct access to TV, radio and mobile phone.

<i>Households which had direct access to:</i>	Amount	Percentage
<i>Tv</i>	21	47%
<i>Radio</i>	33	73%
<i>Mobile phone</i>	42	93%

4.2.7 Access to shops, markets and physical protection

There is a small village shop where people buy dried and canned food as well as snacks. The houses with powerful enough batteries connected to their solar panels also keep a freezer filled with ice cream, frozen meat and such that they sell to the other villagers. Apart from this, people go to Vunisea to a supermarket to buy food or other supplies that are unavailable in Dravuwalu. Some people also go to Suva regularly, where a larger food supply is available. Many households also receive food shipped to them from relatives on the mainland.

Regarding physical protection the only physical constructions in Dravuwalu are the houses people live in, the church and the community hall. A few respondents mention that in case of a cyclone some villagers find refuge in the church or at their neighbours' house, if it is made of concrete and appear to be more stable than their own house. Before the introduction of modern houses people lived in traditional bures. A bure is a house made only of materials found in the surroundings that are either stacked or tied together. According to several villagers one great advantage of the bure is that if a cyclone hits the roof will fall apart alongside the walls on the outside of the bure. This is significantly safer for any person inside the bure as it falls apart compared to if a concrete house would fall apart. Several respondents mentioned other advantages with the bure; the soft floor, the fact that it is cooler in the summer and warmer in the winter compared to the houses they live in now. However, the bure requires more maintenance and is smaller in size, which is the reason why there are no bures in the village today according to several interviewees.

4.3 Access to financial capital

Financial capital is the income of cash, remittances, credit and the access to paid labour. The access to these financial indicators will be considered in the following chapter.

4.3.1 Access to paid labour, remittances and distribution

There are only a few people in the village that have some sort of paid labour, around five people according to some interviewees. The pastor receives a salary from his church and the teachers are paid by the government, but most people in Dravuwalu do not have a salary.

In Fiji it is tradition that whenever a family member moves out of a village to find work they will send money or food back to their family, on a regular basis. Consequently, there are many households in Dravuwalu that are getting remittances from relatives living on the main island. This used to be something everyone would do, but some villagers mention examples of family members that did not send any money despite the fact that they were now making good money in the main land.

4.3.2 Access to trade income

Most people earn money from selling yaqona through an agent living in the village, who brings the yaqona harvest to traders at the markets in Suva. During

hurricane Winston in 2016 many yaqona fields in Fiji were destroyed, but the ones in Dravuwalu survived. A consequence of this sudden decrease in yaqona supply all over Fiji is the increase in price of yaqona, allowing the farmers in Dravuwalu to make significantly more money selling yaqona compared to before Winston hit Fiji. All respondents mention that the yaqona price has increased multiple times, an increase along the lines from around 10 FJD (barely 5 USD) per kg before Winston and to at least 110 FJD (just over 50 USD) now. There are some other trade incomes practiced in Dravuwalu as well, although at much smaller scales. For example, several women in the village sell carpets that they have woven, and some men sell their catch at fish markets.

4.3.3 Access to capital income and credit

None of the interviewed villagers have access to any capital income or knew of anyone in the village that have it now or have had it in the past. None of the individuals have bank accounts but the youth group have a collective bank account, so it is not unheard of in the village. Similarly, several respondents said that no one in the village borrow money from a bank. Instead whenever someone needs money, they usually borrow from family members or another member from the village.

4.4 Access to human capital

In the following chapter, access to Human capital will be considered with the indicators of nutritional status and access to health care and education.

4.4.1 Access to health care

There is currently one nurse living in Dravuwalu. She has some medical training and take monthly trips to the hospital in Vunisea, where she collects medical supplies and meet up with other nurses. She takes care of issues like headaches, small cuts and scabies, but in order to get more advanced medical care the people of Dravuwalu have to go to either a health centre in the neighbouring village Soso or to the hospital in Vunisea. Pregnant women go to Vunisea or to relatives in the main island to give birth at a hospital. All respondents say that people in the village do not have to pay for health care, at least not when they go to the nurse or to the hospital in Vunisea. Some respondents believe that it would be expensive to be treated in the bigger hospital in Suva, other say that they believe all health care is free of charge. People in the village say that several decades ago, they only used medicines that were made by plants they could find in their surroundings and they never went to hospitals. The nurse says that she still uses these traditional medicines sometimes, but she uses modern medicines as well.

4.4.2 Access to education

The village has its own primary school, which is paid for by the government. However, this money is not enough to cover all costs, so the teachers must collect some money from each household in the village every year. Secondary school is also for free of charge, but the students must go to another village for this. Some families send their kids to relatives in Suva or other villagers for secondary

school, other children stay in boarding schools for the semesters. Some villagers are worried about that the education might not be free in the future, since it depends on their government. Primary and secondary school have only been for free for the past five years or so, according to one respondent. All respondents mention that it is good that the children get to go to school, as they learn and come back from school with new inputs and ideas. However, some respondents also uttered concerns about the younger generation not following all the village rules and that this is disrespectful. They believed that it is of importance that they preserve their traditions and culture and keep respecting the village rules. Some people who have either moved out of the village for good or been away for a while comes back with new ideas that goes against their traditions.

4.4.3 Nutritional status

The nutritional status in the village appears to have changed in the recent decades. All older respondents recall that they used to eat only the things they could get from their farmlands, collect from their surroundings or fish from the ocean. Today they earn more money from the yaqona and consequently they buy more food such as rice, noodles, biscuits and snacks, which is less nutritious. When people were asked about what they ate and how much of the food they eat comes from their own farm, the answers differed a lot. At first, many answered that they only eat things they grow on their farm. After thinking for a while, they realized that they eat a lot of rice, noodles, biscuits, butter and flour to make bread. Some claim that up to 80 % of their food consumption consists of groceries today. At first some respondents said that this was temporary and because of the recent cyclone destroying some crops, but after thinking again they realized that they also ate very much rice and noodles before the cyclone. Still, the increase in income for the village, since hurricane Winston, appears to have had a significant impact on this village nutrition behaviour.

Another consequence of buying the food is that the villagers do not have to walk to the farm as often now compared to before. Some older men said that they used to go to the farm every day when they were young, but now most men only go to the farm 3-4 times a week. Furthermore, several respondents said that women sometimes used to go to the farm to collect food, but now they never went because they did not have to. Although the women are as busy as the men during the days, they do not have as many physically demanding tasks and consequently do not get much exercise.

4.5 Access to social capital

The indicators used for social capitals in this study are for example: the community decision-making, community groups, reciprocal behaviour and social protection, which are considered in following chapter.

4.5.1 Household composition

The population in Dravuvalu is just above 200 inhabitants and there are around 40-50 households in the village. The villagers describe that in Fiji, families usually want to have many kids. In Dravuvalu, there are about 80 children

and 125 adults (people over 18 years old). However, there are only a few young adults in the village, the majority of the population consists of young children and seniors. All teenagers move away to go to secondary school and many young adults move to other parts of Fiji to study or get a job. The normal household composition is either two parents with their young children, an elderly couple living alone or together with some of their grandchildren.

4.5.2 Community decision-making and projects

The chief of the village and the elders are still the ones that perform the decision-making in the village, as has been the case for as long as anyone could remember. However, there were several people in the village who expressed concerns about that some people in the village wants their "human rights". What they meant by that is that it was easier before when everyone did what they chief or elders told them to do without questioning the decisions. Nowadays it happens that some people question or ignore some of the decisions. Every month there is a meeting chaired by the chief and the elders that everyone is allowed to attend, but some respondents say that it is mainly the men who attend. In the meeting it is decided what communal work should be done in the village the coming month and tasks are distributed. The meeting is also the place to bring up potential disputes between members in the community, although several respondents mentioned that there never are any disputes.

4.5.3 Community groups

There are some different community groups in the village. One group consists of women that meet once a week where they can talk and weave carpets. Another group is the youth group which consists of the young men in the village. They have a rugby team and they help on farms that need extra help in exchange for money, which they save on a bank account. The money they got from this has been used to build the community shop and to buy their rugby team shirts. Apart from this there are also working-groups of around five men that are decided by the chief and given tasks at the monthly meetings. They work together and help each other on the farms, and no one ever work alone on their farm. There are also a more "non-expressed" group of the village elders which consists of the older men who together with the chief and the village headsman (government spokesman of the village) prepare the monthly meetings, update about what needs to be done in the village and what new decisions the government have made.

The village is divided into five mataqali (clans): Butobuto, Vuniivi, Naiboletaki, Natabuilava and Naibalebale. These are then divided into tokatoka, which is the extended family. Decades ago, members of Naiboletaki were the fishermen of the village, another was soldiers and the others were farmers. Back then there was more of a cast-system but now all mataqali are relatively equal in status, and everyone does both fishing and farming. However, the village chief is always in the Vuniivi-mataqali and the priest or pastor (whom often comes from another village) is always assigned to the Natabuilava-mataqali.

4.5.4 Reciprocal behaviour and community cohesion

From what could be observed by the researchers, there is some sort of rang or status division in the village where the chief and the elders were the ones on top. The women do all the household chores and take care of the children, while the men do all the farming and repairing the house etc. When asked if the men also do some household chores one respondent answered: "Well of course, if the woman is sick then the man must do it by himself". The women and children usually eat on the floor while the men eat at a table. Furthermore, the women always start to eat after the men, or guests, have started eating. It is also custom to always invite everyone that walks past their house to dinner or tea, since that is the respectful thing to do.

Decades ago, people depended more on goodwill and that everyone aided the village with their part. Now, people are supposed to take more responsibility for their own family. However, they still have what they call "kerekere" which means that everyone in the village should help each other and you should be able to borrow things and get help from your neighbours without getting anything in return.

Everyone in the village are Methodist Christians and joins at least one of the three church services every Sunday. All respondents say that they say grace before every meal and profoundly believe in God, which is in line with observations made by the researchers. This is a possible contributing factor to the strong community cohesion in Dravuwalu. The villagers have been Methodists for as long as anyone could remember.

4.5.5 Social protection

The villagers also mention that the Fijian way is to always help each other, as they have a kerekere system. All respondents claim that if someone needs anything, then you will give it to them without expecting anything in return, as you might need their (or someone else's) help in the future. On the question of if it might be difficult or embarrassing to ask for help, people answered with certainty "no". They stated that it is just to ask and someone will help you, although they usually ask their family or extended family first.

Apart from getting help from other people in the village, they will also get aid from the government and from nearby villagers that can help when needed. For example, Dravuwalu were sending over yaqona roots to other nearby villages that were hit harder by the latest cyclone, so that they could plant these. People also stated that the government usually aids by giving food and clothing for six months after a cyclone to the affected villages and they also pay 1/3 of the costs of rebuilding the houses that have been destroyed or damaged. Five of the houses in the village were donated by the government after cyclone Loti in 1974 and nine of the houses were donated after cyclone Meli in 1979. It seemed as the government only aid the community after something have happened by giving food and building material and that there are no plans for what to do in a disaster or how to prevent damage. This seems to have been the case for a couple of decades. Furthermore, a few people talked about climate change

and people in the village, due to education, knew about the threat in the future of more severe natural disasters. They did not mention any way to prepare themselves or to decrease damage to their village and some people mentioned that it is out of their control to do anything about the climate change.

5 Discussion

The focus of this discussion is on the effects of changes in sustainable development capitals that Dravuwalu has experienced through the recent development. Here, the effect on the village's vulnerability towards disasters is central.

5.1 Rapid development

Fiji is a typical "small island developing state" which is prone to natural hazards and many villages are developing very fast. The development from self-sufficient village, without electricity, water and sanitation service, telecom and Internet into highly embedded and globalized villages and cities took about 100 years for many highly developed cities in for example Europe, but many villages in Fiji are going through these changes in just a couple of decades.

In Dravuwalu there are some examples of this rapid development being problematic. Firstly, the introduction of a cell tower close to the village a couple of years ago accelerated the use of mobile phones in the village to the point that now only mobile phones are used. Some respondents mentioned that they used to have a landline phone but now they only use the mobile phone, and there are no landline phones in the village anymore. Consequently they are entirely dependent on mobile phone coverage in case of an emergency, and the reception is not very reliable. Whenever there is bad weather it is impossible to get a signal with the mobile phone. Furthermore, if the cell tower were to be damaged in a cyclone there would be no way to call anyone until the tower is repaired. Although the introduced access to mobile phones is positive for the villagers, the fact that they have abandoned all other kinds of communication has made them more vulnerable.

The recent change in diet is likely to have negative long-term effects on the population. The current diet consists mainly of fast carbohydrates in the form of instant noodles and white bread, as well as canned food in the form of tuna and corn beef. It can be argued that this transition from a relatively nutritious diet consisting of fish and various crops into a much less nutritious one is because of the increase in usage of money in Dravuwalu. Most respondents admitted that they bought most of their food nowadays because it is easier and less time consuming to buy the food than to collect it from the farm and the ocean. However, it is impossible for most households to store fresh or frozen food since they only have electricity for a few hours a day. As a consequence of this only canned and dried food are sold in the village shop, which makes healthier food unavailable to buy in the village. There are some frozen food sold by the owners of the few freezers in the village, but the supply is small. It is therefore argued that the rapid increase in use of money has led to an unhealthier diet among the villagers, partly because the development of electricity

availability cannot keep up. Poor health could influence how well a society can cope with natural disasters. For example, it would be harder to escape if one needs to evacuate from a tsunami or storm. Those that would be most affected are probably those that usually are more affected, the women. Studies have shown that women usually do not learn how to swim and run as much as men do. Cultures have usually influenced women to dress in clothes that are less convenient to move around in and women usually take care of small children and the elderly (IUCN, n.d. Neumayer and Plümper, 2008).

5.2 The effects on the village due to more money

The village have some shared expenses such as church-fees, diesel for the generator and fundraisers for the school. As money is growing more important in Dravuwalu, it is interesting to discuss what would happen if the villagers became more independent and more prone to fend for themselves and their immediate family instead of for the whole community, as Becker (2017) found to be the case in Solevu, another coastal village in Fiji. Since there is a trend of more households with solar panels in the village, there is a possibility that they will be unwilling to pay for diesel to the generator in the future if they become self-sufficient for electricity. This would leave the households unable to afford solar panels alone to maintain and fuel the generator, which they might not be able to afford on their own. Furthermore, the system to pay equal amount might have been good while people had a more even economy, but now it is not very beneficial for the people that are less wealthy. This since they have to pay as much as the people that are wealthier for the shared expenses and they might not use the same amount of electricity if they cannot afford washing machines and TV's. Nevertheless, money is both an opportunity to develop a society, but there is also a risk that it increases the inequality in a village.

5.2.1 A vulnerable source of income

At the moment Dravuwalu mainly have one source of income - the yaqona root - which makes the influx of money to the village vulnerable. Ever since hurricane Winston in 2016 the price of yaqona has increased drastically and consequently, the profit from selling yaqona has increased as well. There is a high risk that this increased income is temporary and once the other villages - whose yaqona was destroyed in 2016 - have recovered their farms, the price will return back to normal again. According to some people in Dravuwalu it takes 2-3 years to grow the root, which makes it likely that the destroyed farms will be recovered soon ¹. If the people in Dravuwalu have grown too dependent on the past years extra income, they might be negatively affected by this. Especially since none of the respondents to the interviews had a bank account and said that they spent most of the money they earned from selling yaqona on food and on renovating the house. Furthermore, the increased dependency on imported food and reliance on the yaqona market has increased the dependency on the world outside of Dravuwalu. This means that events outside the village are now more likely to have an effect on the village, which increases the vulnerability.

Whether the people of Dravuwalu will be affected by the possible decrease in

¹At the time of research - may 2018

yaqona income the coming years or not depends on how reliant they have grown on money. Imagine that there is a sudden drop in yaqona price or a cyclone that destroys all the yaqona crops around Dravuwalu. The first question to consider is whether the villagers still will have enough food. As mentioned earlier, the majority of the villager’s current food intake consists of food they buy from stores. However, it was not that many years ago that they were completely self-sufficient when it comes to food. When asked about this the villagers themselves claimed that they could still sustain the need of the village in terms of food with the crops from the farms. However, there is an uncertainty to whether this is true or not as they are currently buying most of their food. Sofer (2015) found that fewer households in Dravuwalu grew cassava, yams and dalo in 2013 compared to 1982 and that the percentage of households growing yaqona had increased in the same time. More specifically, the cultivation of yaqona increased from 96 % to 100 % between 1982 and 2013, and modern vegetables increased from 0 % to 14 % (ibid.). Cassava, yams and dalo decreased, see Table 5 (ibid.). Consequently, there is a decreasing trend in farming edible food. Although this study does not investigate if Dravuwalu still is still self-sufficient when it comes too food, it is concluded that there is an uncertainty to it. Furthermore, the longer time Dravuwalu will go on without supplying their own food, the more difficult it is likely to be to go back to the old ways.

Table 5: Percentage of households cultivating different crops 1982 and 2013 Sofer (2015).

<i>Cultivated crop</i>	1982	2013
<i>Yaqona</i>	96 %	100 %
<i>Cassava</i>	92 %	46 %
<i>Yams</i>	31 %	25 %
<i>Dalo</i>	100 %	96 %

Furthermore, it is not evidently that a scenario where yaqona prices drop drastically will lead to a decrease in cash income in the long term. There are other sources of income into the village and it is possible that the people of Dravuwalu will exploit them more in the future. Sofer (ibid.) surveyed 26 households in Dravuwalu in 1982 and 28 in 2013 and some of his findings are relevant to this discussion. Yaqona was the production that contributed to most cash income followed by fish and dalo. Some crops and livestock are exchanged, and some are used for subsistence in Dravuwalu (ibid.). However, even if most cash income derives from agriculture and fishing (74.8 % of total cash income in 2013), the village also depends on remittances (12.4 % of total cash income in 2013) (ibid.). Both incomes (agricultural/fishing and remittances) have increased since 1982 according to Sofer (ibid.), but wages have decreased from 42 % to 1.4 %. The point is, that if the people in Dravuwalu want to make more money they supposedly have some other sources of income available. However, one major limiting factor for increasing the income from fish could be the fact that they cannot freeze or refrigerate a large catch. Consequently, the catch cannot be sold at markets in Suva, as the fish would not be fresh when it arrives to Suva (if they deliver it themselves) or when a trader comes to the village to buy the fish. Furthermore, they are limited by the lack of agricultural technology. Currently

all the farming is made manually, making it difficult to increase their harvests and consequently to make more money from trading crops. In the future, there might be a road through the islands of Kadavu since one person said that the people in villages in Kadavu had sign a petition for a road. This might aid in transporting crops from the village, but also to transport larger machines to the farms and the village, which would increase access to physical capital.

5.2.2 Money's impact on housing

As access to money has increased in Dravuvalu, a lot of this money is spent on renovating and expanding the houses. One of the reasons that Dravuvalu was able to cope better with cyclone Keni (2018) than other villages on the same island could be that they have an increased proportion of houses built in concrete. According to UNDP (2007) it is a common belief that concrete block or other heavier building material, are safer in cyclones. However, this is not always true since the ability for a building to resist the effects of wind depend on the way the materials are used (ibid.). Buildings are considered as vulnerable if they cannot withstand the forces of high wind. In Dravuvalu, many houses are now built in concrete in order to resist cyclone winds. However, in case of an earthquake, they could be dangerous if they break and heavy material falls on people. Furthermore, if a concrete house collapses during a cyclone it is more dangerous, as the debris from it easily can injure or kill a human. Light structures, especially old houses with wood frames are weak but also poorly constructed or unenforced concrete blocks are vulnerable (ibid.). Still, reinforced concrete houses are generally considered safer due to the heavy material making it harder for the wind to lift the house. The most common effects of cyclones on houses are that the house can be rolled over if the connections of the house to the footings are improper. If the roof is not anchored, this can lead to the destruction of the house. Another way for the cyclone to damage a house is for the windows or doors to break (ibid.). Consequently, it is possible the increase in concrete houses in Dravuvalu has decreased its vulnerability against cyclones. It is however not necessarily the case, as it is of highest importance that the concrete buildings are maintained and constructed in a solid way. Then again, Dravuvalu was not severely affected by cyclone Keni while many other villages on Kadavu were, possibly due to the increased quality of housing. However, it cannot be said for certain that this is the case, as it might as well be due to Dravuvalu's geographical location that they escaped severe damage. Furthermore, cyclones are normally followed by heavy rains, which can lead to flooding which in turn can damage buildings. The houses in Dravuvalu were a often a bit elevated to avoid smaller floods. However, one concrete house was damaged due to that water from the river flooded the entire floor during the research period. Other factors that affects the vulnerability of the house is the shape (square is best since high winds can go around) and to be sheltered by strong trees or hillock (ibid.). However, one should avoid the "funnel effect" by arranging the houses in clusters rather than in rows. In high winds, flat roofs are easily blown off which can be avoided by using hip roof or high gable roof (ibid.). Almost all houses in Dravuvalu were shaped as squares and one house was rebuilding the roof during the time of study. Much work were put into making the roof stable and anchored since it was destroyed during cyclone Keni.

5.3 Decreasing importance of the kerekere system

There seems to be a trend of decreasing social capital in Dravuwalu. All villagers from the interviews were proud of their kerekere system where they take care of each other and can ask each other for favours without expecting anything in return. However, the fact that people now expect money in return for letting someone come along on their boat ride or for farming their land is contradictory to the kerekere system. It is possible that the increase in income to the village has resulted in a decrease in social capital. Becker (2017) found that increased financial capital had decreased social capital in Solevu (another coastal village in Fiji), as the money was not equally distributed within Solevu and this brought on feelings of jealousy. Furthermore, families and individuals worked more independently in Solevu, in contrast to Dravuwalu where working groups are still used in benefit to everyone in the village (ibid.).

The various mataqali vary in size and in the smallest, there is currently only one family. This could be problematic if the social capital continues to decline, considering that people would help someone from their own mataqali before anyone else. This would make the families in the smaller mataqali more vulnerable due to family affiliation. Furthermore, social capital can outweigh the lack of other capitals (DFID, 1999), which also means that if social capital is reduced it can have a reducing effect on other capitals as well. For example, in Dravuwalu everyone has access to a mobile phone, either directly by owning one or indirectly by borrowing one from a family member whenever they want to. If this were to change and everyone who have a mobile phone do not want to share it with others anymore, it would leave the rest of the people without access to mobile phones. In other words, it would decrease their physical capital. Historically the social capital in Dravuwalu has been very strong and many people still rely on it. Considering this, it is worrying that the social capital appears to be decreasing, since it might lead to decreases in other capitals as well.

Similarly DFID (ibid.) states that a high level of social capital can add to human capital since knowledge is shared between people or groups. The younger people in the village claimed that the older people do not teach them how to build things the old way or the old tales about how to recognise when a storm or cyclone is on its way. On the other hand, the elders claimed that the younger people did not want to listen to their stories. It is thus likely that some knowledge that has been in the village for generations will be lost, which could lead to a decreased resilience as this knowledge has been important to the village resilience in the past. For example, the elders used to diversify their crops more than what is done today. By growing various crops, where some are less prone to be destroyed in a flooding but did not taste as good as other crops, they spread out the risk of losing their food supply.

5.4 A change for the better?

It is difficult to say whether Dravuwalu is a more or less resilient society now compared to a couple of decades ago. First of all the natural capital appears to have decreased slightly. There is a small decrease in vegetation coverage and

natural beauty, but whether these changes have a significant effect on the resilience is unsure. Secondly, several indicators for physical capital has increased, some remain unchanged and a few have decreased. The increased access to electricity due to introduction of solar panels has opened up the opportunity to new business and activities within the village. Together with the increased access to Internet, mobile phones and TV's Dravuwalu is now more connected to the world outside the village. However, there is also a small decrease in access to boats, as money is now expected in return for a boat ride with one of the boats in the village. Furthermore, it can be argued that the physical protection has decreased, as there are no bures to stay in during a cyclone. Thirdly, the financial capital has increased, due to the increase in trade income from yaqona. However, as discussed previously there is a significant uncertainty towards only having one main source of income throughout the village. Regarding human capital there appears to have been an increase in access to health care and education, but also a decrease in nutritional status. Finally, there is a trend of a decreasing social capital. Although Dravuwalu still has strong community cohesion, a further decline is likely to result in a less resilient community, at least in the short-term. It can be argued that the strong social capital in Dravuwalu is a major contributor to its resilience. The villagers have access to several other capitals through their social capital. For instance, the farming is controlled by the village chief, who makes sure that all farms are maintained. In other words, everyone in the village can earn money from selling yaqona, regardless if they spend any time on their farm or not.

Still, it is not easy to explicitly say whether Dravuwalu is more or less resilient now compared to before. One reason for this is that the indicators are not equally important in all possible disruptions to the community. It is not possible to weigh the introduction of solar cells towards the decrease in nutritional status and say that one is more important to the community resilience than the other. It can however be said that the development in Dravuwalu does have an effect on the community resilience, since it does have an effect on the sustainable livelihood capitals.

5.4.1 Increasing some capitals while sustaining other capitals

The Sustainable Livelihoods Framework is not sufficient to determine whether Dravuwalu is getting more or less resilient. The framework is not able to determine change in resilience when one capital decrease and another one increase, nor when one indicator increase while another one in the same capital decrease. This results in a strong dependency on what indicators that are chosen. A society's access to capitals, or indicators within the capitals is not stable or predictable. An increase in one capital for one society might result differently for another society due to many different variables. One could compare the livelihood portfolio as a complex equation where all different indicators and capitals are variables. This equation looks different for each society and is dependent on much more than only the variables within the village and the variables could impact each other more or less. It is easy to understand that the equation becomes more complex with more variables and with more dependency between the variables. Scoones (1998) also mentions:

"It is not only the total number of sustainable livelihoods created that is important, but also the level of livelihood intensity."

Nevertheless, one should not focus too narrowly on the indicators or capitals, but rather try to focus on the study's purpose. In this case, the purpose is to understand how development have affected access to capitals and how the perceived change in access to these have changed, in order to understand if development have changed the ability to cope with natural disasters. Some capitals and indicators might be of more importance, but the overall goal for a society should be to increase capitals while sustaining the other ones. Dravuwalu have had an increase in financial capital but a decrease in social capital. The most optimal for the village should be to sustain the social capital, for example the "kerekere"-system, and also increase their economy. As Becker (2017) could see in Solevu, there is a risk that the increase of, for example money, could result in an unevenly spread development. If some people start to earn money, they could also increase other capitals as well while those that do not have money, falls behind. Those who earns money would not be as dependent on the social capital and the ones that are most vulnerable would suffer from both lack of money and a decreasing social capital. There is therefore important that the development is shared among all groups. As Twigg (2001) concluded; greater access to capitals usually reduces vulnerability to disasters, but not always.

5.4.2 Dependency on governmental aid

Several things appear to have improved the living standards in Dravuwalu. The tank for water is donated from the government, even the diesel generator. The way the village currently gets diesel is somewhat uncertain as they get it from the chief's relative. What happens if the water distribution gets destroyed and they cannot get aid from the government? What happens if the diesel generator stops working or if they, for some reason, cannot get more diesel? Have the village the ability to cook, do laundry and other chores without the electricity or could it result in an irritation to have to put more job into something that have become much more easy?

As can be seen in societies who get aid from their government, there is a trend that the individuals in the society stops "thinking for themselves". Instead of solving problems by their own, people start trusting their government or the community to help them. This has not been investigated in this study, nor is it mentioned in Becker (2017) or Sofer (2015) but could become a problem in the future. Since Dravuwalu is situated relatively far away from the main island, the governmental aid might linger. In this case, their remoteness might in fact be an advantage, since the society needs to be able to at least manage until rescue from the government reaches them.

Even though it can be problematic to blindly apply the results from this study into other societies, many of the findings here can be used in a wider context. The results from this study can be validated since it shows the same trends as other studies, for example Becker (2017) and Sofer (2015). Also, these results might not only be of interest for less developed societies but could also be relevant for more developed societies such as Sweden. For example, urbanization

has been a problem for decades in Sweden. Since less and less people wish to live in the countryside, houses are usually hard to sell in these areas and smaller businesses have to be shut down due to less population. The smaller and more remote villages in Sweden are more and more decayed. Furthermore, the citizens in Sweden rely heavily on governmental aid and most citizens take minimal responsibility for taking care of themselves in case of emergencies. The Swedish Civil Contingencies Agency (MSB) sent out a brochure in 2018 on behalf of the government, in order to prepare the citizens for catastrophes or crisis. Another similarity between societies in Sweden and Dravuwalu is that the landline telephones are not being used as much anymore since mobile phones have taken over. However, if there is no network, people cannot contact each other, which will be problematic in a crisis.

5.5 Uncertainties

Societies are complex and consequently it is not easy to map or understand it completely. It is possible that if other indicators of sustainable development would have been used the conclusions would have been different. Nonetheless, the conclusions are based on actual trends discovered in the study, making them relevant.

Furthermore, the on-site field study was made during a time period of two weeks. Some might argue that two weeks is not enough time to fully comprehend a village and its societal functions but bear in mind that the village only contains around 50 households and that the researchers stayed with a family in the village during the entire time. Thus, it was possible to make constant observations adding to the depth of the study.

There are also uncertainties related to studying the development in Dravuwalu over time through the villager's memory and perceptions, instead of making two separate field studies years apart and then comparing them. There is always a risk that people's memories of the past are not entirely true. However, as mentioned before, the focus of the study is finding trends in development. This is still possible to do using the method executed in this paper and should therefore not have an effect on the resulting conclusions.

One might also argue that the people that were interviewed was not representative enough to cover the overall perception of the people in the village. However, 20 people in four different groups and the representatives were from different mataqalis and households and in different ages and sexes were interviewed. Also 4 individual interviews were made so that about 25 % of the adults in the village have been able to present their view of the life in the village.

Similarly, there is always a possibility that some answers received at the interviews are not entirely correct. This could for example be because the respondent remembers something incorrectly, have too much respect for the interviewers to speak their mind or have too little respect for the study to care about questions asked. In order to avoid this, similar questions were asked to all respondents, which made it possible to cross check the results and identify incorrect information.

6 Conclusion

Following research question is investigated in this study:

“In what ways has development affected access to sustainable livelihood capitals and how has the perceived access to these capitals changed in the past decades in Dravuvalu, a coastal society in Fiji?”

The development the past decades has affected the access to several sustainable livelihood capitals in Dravuvalu. The access to natural and social capital has decreased slightly, while the access to financial capital has increased. Regarding physical and human capital there are some indicators pointing to an increase and others to a decrease. Also, the access varies within the community. A rapid increase in trade income from selling yaqona appears to have had a role in the reduced social capital and in the decreased nutritional status. However, it has also made it possible for more villagers to renovate their houses and install solar panels. Moreover, it is potentially problematic that yaqona is the main source of income as its market value varies greatly, making it a vulnerable income.

The Sustainable Livelihoods Framework alone is not sufficient to determine whether Dravuvalu has become more or less resilient. Still, trends found in this study, as well as in Becker (2017) and Sofer (2015), show that the village has developed significantly the past decades and the sustainable livelihood capitals can describe this. What also could be understood from this and from the previous mentioned studies is that the development in Dravuvalu has affected the resilience.

The results from this study could be used as a comparison to other similar societies if one keeps in mind the differences between the societies. It can be one of several keys in the understanding of how development affect disaster risk, not only for small societies similar to the one in this study, but similar trends can also be seen in more developed societies for instance, smaller societies in Sweden.

Furthermore, there is an increased dependency on money and factors outside Dravuvalu have more effect on the village now compared to before, which increases their vulnerability. Decades ago, the village could repair and rebuild their houses and sustain their needs for food and water solely from their surroundings, but now they are more dependent on money for access to these things. On the other hand, more access to the outside world and consequently to modern technologies facilitates life in the village. Lastly, the real challenge with sustainable development in Dravuvalu appears to be to increase one capital without decreasing another. Specifically, to make sure that all individuals have access to enough capitals to retain a sustainable livelihood, to prevent anyone from falling behind.

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