Pacific Financial Inclusion Programme
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Weather Index-Based Insurance in Fiji: Brief on Initial Scoping

Introduction:

Microinsurance is a product designed to give low-income households coverage for life events in exchange for a low cost premium. While microinsurance is touted as the fastest growing microfinance product in the world, it has yet to be developed successfully in the Pacific. There are now a number of underwriters looking at the potential for funeral, life, and health coverage products.

However, with as much as 80% of the population of some countries in the Pacific involved in agriculture, there is a potential for a product that could provide some form of coverage in the case of failure of crops. Such an insurance product would have to be affordable as well as accessible to farmers in rural areas. Given the low levels of income earned by these farmers, traditional agriculture based insurance products would be too expensive to meet these requirements.

One possible solution would be weather index-based insurance, which has been used in many developing countries to provide affordable insurance products to low income farmers.

Weather index-based insurance: Concepts and Characteristics

Under conventional crop insurance, the loss paid is that directly suffered by the farmer. Assessing this loss can be a costly process, which becomes unfeasible when looking at a large number of small-scale farmers. A solution to this is weather index-based insurance (WI). Under WI, the loss depends on an objective measured parameter (for example rainfall or temperature) recorded during an agreed time. This makes providing such an insurance product to low income markets cost efficient.

The 2010 ADB report[1] on microinsurance estimates that there is a market of at least 250,000-300,000 people in Fiji alone. Further, the ADB report estimates an ability and willingness to pay for microinsurance of between US $1-6 per week.

WI is best suited to weather hazards that are well correlated over a widespread area and where there is a close correlation between weather and crop yield. To date, most WI efforts have focused on drought [2]. The advantages and disadvantages of WI are[3] :

[1] ADB (2010) Expanding Insurance Outreach in Fiji
[2] WFP & International Fund for Agricultural Development (IFAD) (2011) Weather Index-based Insurance in Agricultural Development
[3] Taken from World Bank (2005), USAID (2006) and IFAD and WFP (2010)

Advantages:	Disadvantages:
Transparency: Loss trigger is clear and can be accessed by the policyholder. Increases trust.	**Basis Risk:** This is the difference between the loss experienced by the farmer and the payout triggered. E.g. A farmer loses their entire crop, but no bad event was recorded at the weather station, so no loss is paid.
No on-farm loss adjustment: Reduces cost. This is a primary advantage of WI	**Limited Perils:** May only cover one or two perils. Farmers may prefer more perils covered
Lack of adverse selection: Adverse selection is when people with worse than average risk characteristics buy an insurance policy. Under WI, the payout is set in a defined area, regardless of risk exposure. Hence, adverse selection is reduced	**Replication:** Details such as what triggers a loss need to be adjusted at each weather stations to reflect the localized weather conditions
Lack of moral hazard: Moral hazard occurs when the insured changes their behavior after taking out the insurance policy, which increases the chance of them claiming. With WI, the insured cannot influence the claims therefore there is less incentive for them to change their behavior	**Technical capacity and expertise** are required, which can be lacking in developing countries
Low operational and transaction costs: WI requires limited individual underwriting (client assessment). It can be distributed at relatively lower cost. Education however is important and can be costly	**Lack of weather data:** WI depends on the availability and quality of weather data, which can drastically vary from country to country
Rapid payout: Measurement of weather station data, with no field loss adjustment, allows for rapid payouts	

This paper shall focus on the development of a WI scheme on a Micro (selling insurance to farmers, households... etc.) or Meso (selling insurance to Farmers Associations, NGOs …etc.) level. It will not focus on developing a WI scheme on a Macro (i.e. governmental) level.

Globally there have been many new index based models developed. WI programs have been launched in Tanzania, Rwanda, India, and the Philippines. Following the introduction of the WI pilot program by the organization MicroEnsure in Malawi (2005-2006), there now exists a model which provides farmers with insurance for both droughts and excessive rainfall.

Pre-feasibility Assessment

The objective of this paper is to perform a pre-feasibility assessment. The aim is to investigate whether the basic prerequisites for a successful implementation of a WI scheme exist in Fiji. Figure 1. details the key areas that need to be in place before considering piloting a WI scheme.

Figure 1[4] :

In-country pre-feasibilty assessment						
Existence of weather risk and potential demand for WII	Availability of weather data and infrastructure	Availability of agricultural data and information	Regulatory environment	Government policies and interest	IFAD and partners programmes	Availability of partners, stakeholders, interested parties, champions

[4] Taken from WFP & IFAD (2011) Weather Index-based Insurance in Agricultural Development

Existence of weather risk and potential demand for WI

In Fiji there are numerous potential catastrophic weather events that can occur, for example tsunamis, cyclones, and extreme flooding. Such events present a high degree of weather risk to farmers, which was evident by the devastating impact of Cyclone Mick[5]. In a report by the Agriculture Ministry in Fiji [5], it is noted that the worst damage was caused by flooding submerging crops for 2-3 days. It also states that after the event root crop prices increased 2-3% and vegetable prices increased 5-80%. This represents a double impact to a farmer – they have less income due to the failure of their crops and they have to pay more for food due to lack of supply.

If a WI product were developed to mitigate the risk of such events, it would be based on the principle of "low premium, low payouts", offering just enough coverage to provide resilience to adverse agricultural events at an affordable price. It is most likely that this product would be based on abnormally detrimental rainfall during critical growing periods during the year.

Availability of agricultural data and information

Demographic and agricultural data in Fiji are weak. PFIP could not locate any large scale mapping showing concentrations of farming communities, which was confirmed by Andrew McGregor from Koko Siga Fiji, a specialist agriculture firm based in Suva. Further, there are few examples of monoculture farming in Fiji, or farming on large scales. The average size per farm in Fiji is small at 3.9 hectares[6] and farmers generally plant a mix of different crops. The existence of monoculture farming is a key requirement to development of WI schemes as different crops have different tolerances to weather. The mix of different crops planted by farmers in Fiji makes the designing of a policy with set loss triggers difficult[7].

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Another natural barrier to entry is the existence of microclimates in different parts of Fiji. Rainfall in one area of the island can be significantly different from another area of the island. This drastically increases the basis risk of WI in Fiji.

The one agricultural product that does have data is sugar cane. Fiji produced 2.3 million tons of sugar cane in 2008, on 50,907 hectares of land. Crushing and exportation of the cane is managed by the Fiji Sugar Corporation Limited (FSC), which oversees the 14,000 active members of the Sugar Cane Growers Council (SCGC). The SCGC has been approached by PFIP, but currently they are capacity constrained. They are concentrating on getting the industry back on track after the crippling effects of the strikes in the past, and do not have the capacity available to enter into insurance negotiations.

Government policies and interest & Regulatory environment

The insurance industry is regulated by the Reserve Bank of Fiji (RBF). The regulators at RBF have expressed specific interest in catalyzing microinsurance stating, "We would support any initiative or pilot projects into micro-insurance". PFIP conducted a review of the current legislation and find nothing overly prohibitive to the development of WI schemes.

IFAD and Partner programs

IFAD finances agricultural development projects primarily for food production in developing countries. When conducting a prefeasibility assessment one should look to leverage projects already carried out in the region, conducted by IFAD or other organizations, related to weather insurance – Look to build upon pre-existing information gathered. Currently there are no IFAD or other weather insurance related programs in Fiji.

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5 Ministry of Primary Industries (2009) Cyclone Mick Damage Assessment and Rehabilitation Report

6 2009 NATIONAL AGRICULTURE CENSUS REPORT, REPUBLIC OF FIJI

7 It is worth mentioning here that the lack of monoculture farming, or multicultural farming, provides inherent risk mitigation from the point of view of the farmer. Differing weather events affect crops in diverse ways, thus planting numerous crops can diversify a farmers exposure to weather

Availability of weather data and infrastructure

The Applied Geosciences and Technical Division of SPC (SOPAC) have advised that most of Fiji does not have any topographic flood plain data, and where there is data, the highest resolution is 20 meters. This resolution is probably not refined enough to use for developing an insurance model and the development of sophisticated flood risk modeling is time consuming and expensive.

The Fiji Meteorological Service (FMS) functions as a department under the Government of Fiji Islands and has the responsibility to provide weather data to the country. The FMS was established under British rule and has been collecting data since 1942. Currently they have 38 weather stations, 29 of which have manually operated gauges and 14 of which are automated (9 stations have both), which collect rainfall and other data. Stations report data daily, and information is stored electronically, but every day there seems to be a significant amount of stations that do not report – Caretakers do not report and automated ones malfunction.

As a guideline for developing WI, there needs to be at least 20 years of historical daily data and the missing data should not exceed 3% of the total daily data set[8]. It is also advisable that the weather stations are automated. Judging from PFIP's initial investigations, the data available in Fiji is unlikely to meet these requirements.

The FMS can theoretically provide this data on a case by case basis for no charge to those who submit official requests; however the process is time consuming. This also represents two issues: 1). It is unclear whether the data available is of high enough quality and detail to develop a WI and 2). If a product was developed, the ability for an underwriter to get timely information from the FMS weather stations to trigger claims payments is doubtful. Timely payment of claims is essential for WI to be successful as farmers who suffer a loss need the payout as soon as possible.

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Availability of partners, stakeholders, interested parties, champions

Currently there are ten insurers in Fiji, two that offer life and eight that offer general insurance. Of the non-life insurers currently in Fiji, Fiji Care has stated interest in a WI product, with the precondition that they have access to enough quality data to build a model. Further, MicroEnsure (which is based in Philippines and has been advising PFIP on this initial research) manages many other WI products in other countries, and in principle would be interested to helping to develop a product in Fiji or other Pacific island country.

In general, there is a lack of suitable aggregators and large networks that could be used for product promotion, distribution, and claims processing. However, below are some of the options that are being explored.

- The Fiji Sugar Corporation (FSC) has over 60,000 members and c. 2,500 employees and represents a possible trial option, but they have financial and management issues.
- Mobile Phone Providers: Digicel and Vodafone, have launched m-money platforms and both are interested in developing products and services to roll out over these networks. The m-money platforms offer great potential but the systems are new, and even globally the methodology remains largely untested. In Fiji the technical issue of how to synchronize this with the FSC payment system, for example, have not been explored.

[8] WFP & IFAD (2011) Weather Index-based Insurance in Agricultural Development

Conclusion:

Prefeasibility Assessment – Findings:	
Existence of weather risk and potential demand for WII	✓
Availability of agricultural data and information	✗
Government policies and interest & Regulatory environment	✓
IFAD and partner programs	✗
Availability of weather data and infrastructure	✗
Availability of partners, stakeholders, interested parties, champions	!

From the above table it is clear that there are several issues that need to be resolved before beginning to consider piloting a WI scheme in Fiji. These key issues and methods to address them are:

1. Agricultural data and information – Needs to be collated on each of the crops that farmers grow. Data also needs to be collected on how much of each crop is planted in a given growing season. This information is needed to understand the tolerances of such crops to adverse weather conditions and whether there is a correlation between this and weather events.

2. Weather Data – Needs to be made readily and publically available in order to determine if it is of sufficient quality to develop a WI. If it is of sufficient high quality insurance companies could use it to develop and price WI products. This data is also essential for prompt claims verification.

3. Aggregator – In order to sell enough policies to achieve economies of scale it would be beneficial if a union or association of farmers was formed. This would group a large number of farmers together, enabling a large number of WI policies to be sold. This will enable insurance companies to keep costs low when delivering WI products and so provide more value to the clients through lower premiums. The formation of an aggregator would also enable the collection on agricultural data.

Fiji is the most likely market where a WI could be introduced in the Pacific and some key challenges remain if it is to be successful implemented on a Micro or Meso level.

That said, there is potential to develop a WI scheme on a Macro level. There are numerous cases of successful Macro level WI schemes globally which effectively share weather related risk at a governmental level. An excellent example is the Caribbean Catastrophe Risk Insurance Facility[9] , which was established to share weather risk between Caribbean countries. A full analysis of a Macro level WI scheme is beyond the scope of this Focus Note, however given the challenges raised above, such a regional model could hold substantial potential for reducing weather related risk in the Pacific.

[9] http://www.ccrif.org/

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