Weather insurance – a viable option in support of the development of Pacific local food crops and fisheries value chains?

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In a nutshell

In the last two decades, Pacific Island Countries (PICs) have suffered billions of dollars in damage and loss due to catastrophic weather events (e.g. cyclones, floods, drought) and other natural disasters (e.g. volcanic eruptions). The predominantly small size and diverse nature of the production systems make agricultural insurance investments unattractive. Biological assets – crops and livestock – typically fall outside mainstream insurance coverage, particularly for small farmers. Opportunities exist for transferring weather-related risks to insurance products that can benefit producers; but these need to be carefully evaluated in the Pacific context.

Weather index-based insurance (WIBI) has been introduced in several African and Asian countries; but there are pros and cons. Given the importance of the agricultural sector to the economies and livelihoods in PICs, governments and value chain actors need to partner with insurers to determine the suitability of WIBI as an option for speeding up post-disaster recovery efforts in Pacific Islands' agri-food systems. Since 2014, Fiji has been exploring the introduction of a WIBI scheme and this experience, and those of other regions, can provide valuable lessons in considering WIBI as part of any strategy for developing local food crops and fisheries value chains.

Key recommendations

- Organise multi-stakeholder consultations under the leadership of governments to agree on the suitability of WIBI, as well as the disaster risk and compensation packages, to be triggered by weather-related disasters.
- Facilitate efficient impact assessment of weather-related disasters on agricultural enterprises and invest in quality weather, production cost and yield data to inform insurance investment and policy decisions.
- Make public funding available to attract private investment. Public-private partnerships are critical to make WIBI affordable for producers, especially in the introductory phase.
- Consider an initial government subsidy of 50-75% for WIBI payments and link to other services (e.g. bank loans) to reduce market volatility.
- Invest in upgrading ICT infrastructure to facilitate payments; mobile phone penetration and banking systems especially in rural communities support efficient collection and distribution of insurance payments.
- Build capacity on WIBI, especially of producers – they need to understand that premium payments are required, without any return in some years.

Why consider weather index-based insurance?

Agriculture makes a significant contribution (10-30%) to gross domestic product (GDP) and is a major source of livelihood for as much as 80% of the rural population in Fiji, Kiribati, Republic of Marshall Islands (RMI), Samoa, Solomon Islands, Tonga and Vanuatu. PICs are prone to catastrophic weather events and other natural disasters (see Table 1); climate change is exacerbating the situation. The cost of damage and loss after a natural disaster can range from 2.6% to 28% of GDP. In 2012, damage and loss to Fiji's agricultural sector as a result of Tropical Cyclone Evan was estimated at US$ 24 million. In 2014, flash flooding caused damage and loss estimated at US$ 109 million (9.2% GDP) in the Solomon Islands.

PIC governments allocate between 0.1% and 3% annual budgets for implementing disaster emergency response and reconstruction plans. However, while they may be able to mobilise international funding to support relief and recovery efforts, only 6% of rehabilitation requirements are generally met. The loss in revenue due to reduced production, exports, disruption in flows of goods and services as well as unemployment, further hamper recovery. Innovative insurance schemes are needed to protect the livelihoods of vulnerable farmers/fishers and other value chain actors.

WIBI represents a special class of insurance that differs from traditional indemnity-based insurance. It is a contingent claim contract for which lump sum pay-outs are made based on the occurrence of a specific weather parameter that is closely associated with yields, cost or revenue. Insurance payments are linked to an objectively determined index (e.g. rainfall). WIBI reduces volatility for the farmers that suffer direct losses of biological assets, and for governments that struggle to fund post-disaster rehabilitation efforts. The governments of RMI, Samoa, Solomon Islands, Tonga and Vanuatu have endorsed the weather-based risk insurance scheme established under the Pacific Catastrophe Risk Assessment and Financing Initiative (PCRAFI). Governments purchase the insurance which covers a one-in-20-year disaster event. However, there have been problems in setting the triggers and the Solomon Islands has withdrawn from the scheme.

How WIBI works

WIBI payments are made based on a forecast of damages and not on losses measured and verified in the field. The disaster trigger(s) and compensation are decided among stakeholders beforehand. It is to be noted that:

1. Payments respond to the occurrence of the pre-agreed trigger event;
2. Policies are calibrated to reflect the specific locations, exposures and risk management objectives of the buyer;

While the intensity of hazards may vary, they will not be eliminated. Preparedness will not replace the opportunity to introduce insurance.

Table 1: Identified perils per country

	Wind	Flood	Drought	Storm surge	Earthquake	Volcano
Fiji	✓	✓	✓	✗	✗	✗
Samoa	✓	✗	✓	✗	✗	✗
Tonga	✓	✗	✓	✗	✗	✗
Solomon Islands	✓	✓	✓	✗	✗	✗
Vanuatu	✓	✓	✓	✗	✗	✓
Kiribati	✗	✗	✓	✓	✗	✗
RMI	✗	✗	✓	✓	✗	✗

3. Insurance can be structured as single season (e.g. the cyclone season), annual or multi-year;
4. Policies leave no room for debate about the coverage or the calculation of a claim;
5. There is no protracted loss settlement process (normally claims are settled in 14 days after the occurrence of the trigger event);
6. Policies can be executed in insurance, re-insurance, derivative or insurance-linked security.

Advantages and disadvantages of WIBI

A major advantage is that WIBI policies are flexible and designed to reflect exposure and risk in specific areas. Neither producers nor insurers can influence the index.
A key disadvantage is that WIBI relies on high quality data which is continuously assessed and such data is often not easily accessible in PICs. In addition, some farmers in impacted areas will receive a payout although there is no damage, and others will experience damage but receive no payout. The advantages and disadvantages of WIBI policies are summarised in Table 2.

Building climate resilience capacity

PICs have benefitted, and continue to benefit, from several internationally-funded programmes that aim to build resilience and disaster preparedness capacity. Many are managed by regional organisations working in partnership with national governments. They provide access to technical assistance for strengthening early warning and climate monitoring systems, as well as financial instruments to manage disaster-related risks and implement climate adaptation and mitigation actions. However, the available funding for these programmes cannot be used by governments and value chain actors to support post-disaster business recovery efforts.

"The consequences of climate change have been devastating. The hurdle of filling in forms after cyclones and the long delays in getting funding post-disaster require different strategies, and more sensitive and speedy responses from officials. Property deeds and other formalities are foreign to the indigenous farmer and fisherman."

His Excellency, Lord Vaea, Tongan noble and former Minister of Agriculture, Kingdom of Tonga

Table 2: Advantages and disadvantages of WIBI

Advantages	Disadvantages
Contracts can be uniformly structured	Can be expensive
Timely financial relief paid directly to farmers	Basis risk (sufficient correlation needed between index pay-out and insured loss)
No loss adjustment needed	Needs long term historical/proven data (weather, yield, cost)
Pooling risk spread over wide area	Satellite data may be expensive
Minimal administration costs	Users need to be knowledgeable
Lack of adverse selection (based on widely available information)	Market size
Less moral hazard (pay-out not influenced by producers and insurers)	

Learning from other countries

PICs can learn lessons from several countries that have implemented WIBI schemes that respond to their Pacific smallholder, diverse, multi-peril production systems.

India

There are three WIBI insurance schemes that cover rainfall (deficit, excess and deviation), relative humidity, temperature (high and low), wind speed or a combination. Premiums are subsidised by governments. Insurance coverage is compulsory for farmers who access loans and the amount is the minimum sum insured for the specified crop. For non-borrowing farmers, coverage is available up to the value of the threshold yield and at normal premium rates. The threshold yield is a moving average of the past five years of actual yield (three years in case of paddy and wheat) multiplied by applicable level of indemnity. If the actual yield is lower than the threshold yield, then claims become payable.

Kenya

The East African Farmers' Federation insurance is a multi-peril (disease and weather) index insurance scheme covering crops such as maize, rice and soybean, among others. It is based on a commercial contract linked to a secure market for the commodities. The government provides a 50% subsidy and premium instalments (split over three months) are based on the cost of production instead of expected yields. The insurance product has been purchased by 3,500 farmers with secure contracts.

Malawi

The WIBI scheme was developed by the World Bank in close cooperation with Malawi's National Association of Small Farmers. The weather insurance contract was bundled with loans to farmers that covered the cost of high-quality seeds. Payments were automatic if the index hit the specified threshold; that is, in the case of low rainfall or severe drought, the insurance paid off part or all of the loan. It has since been phased out as there is no private insurance provider.

Morocco

A multi-peril insurance scheme was introduced in 2014 for fruit trees, covering hail, frost, wind, high heat and excess water. The cover limit was flexible and left to the farmer. The premium was subsidised (50-70%) by the government. The fund is managed by the private sector on behalf of the government and payment is based on individual statements of the loss incurred. The government was the only actor with the authority and legitimacy to bring together all the stakeholders involved (insurance companies, banks, farmers, cooperatives etc.) and to regulate their interventions.

New Caledonia

New Caledonia operates a highly subsidised farming system with large commercial farms, and is based on the EU model. It is the only Pacific Island nation that has an established agricultural insurance scheme. It also has the longest established (100 years) and most developed producers' association, Chambres d'Agriculture New Caledonia. The indemnity-based scheme is compulsory for farmers seeking loans and includes life insurance and other products. New Caledonia also has a sophisticated mobile phone and banking network.

Philippines

The Typhoon Index Insurance Cover with a dual indemnity trigger system is available for rice farmers. An indemnity payment is triggered if the typhoon tracks within a defined distance (maximum of 140 km) from the insured farm location(s) and according to the maximum sustained wind speed at the closest point of track. It is supported by very accurate historical data and payouts are automatically calculated.

Zambia

The bundled weather index (against severe drought or excessive rain) and life insurance product, FarmerShield Weather, was introduced in Zambia in 2014. Insurance provider MicroEnsure and NWK Agri-services – a contract buyer and input supplier that services over 130,000 small-scale farmers – partnered to develop the product. At the start of the season, NWK pre-finances the insurance

premium (100%), the cost of which is added to the farmers' loan balances or recovered from farmers at the end of the season. Since 2015-2016, 52,000 farmers have bought insurance as opposed to 3,000 in 2014-2015.

In 2017-2018, Mayfair Insurance Company Zambia Limited was contracted by the government, with grant funding from the International Finance Corporation, to scale up its WIBI product to reach an additional 300,000 smallholder farmers; up from 100,000 who benefit from government input subsidies. This is expected to improve farmers' resilience and sustainable farming opportunities.

Zimbabwe

Zimbabwe has a privately funded commercially viable WIBI product called Ecofarmer, which provides coverage for maize farmers against false or excessive rainfall and drought. WIBI is bundled with other services including market information and production tips. Farmers pay for the service.

Thailand

Thailand, with World Bank support, introduced a weather index insurance scheme in 2006 for maize, based on drought. The government pays 60% of the premium. District agricultural extension officers are responsible for reporting losses in the declared disaster zone to the provincial disaster relief committee to trigger a pay-out. There has been little incentive for private sector investment.

Critical success factors

The critical success factors for establishing a WIBI scheme include: the existence and involvement of strong farmer/producer organisations and insurers in the design; government coordination and subsidies; bundling weather insurance with loans, life insurance, inputs or crop sales contracts to attract farmers and secure markets; well-developed mobile banking systems and phone penetration; sufficient scale and data on crop production costs and yields; the existence of a competent weather authority with sufficient quality historical data; specific insurance legislation; and the ability to identify the correct trigger events for insurance purposes and payouts.

Because of the small scale of the agricultural sector in most PICs, it is unlikely that WIBI can be initiated without the support of the national governments working in partnership with producers and insurance service providers; public-private-producer partnerships will be crucial.

Box 1: WIBI – The case of Fiji

Fiji initiated the process for introducing WIBI in 2014, with the assistance of FAO, the Fiji Crop and Livestock Council and the government of Fiji. The process is already well advanced.

Fiji is located in the tropical cyclone belt. On average, Fiji's 332 islands face one cyclone per year. Maintenance and repair of national infrastructure following cyclones drain limited financial resources. The concept of parametric crop insurance was introduced in 2014 and was widely accepted. Fiji has collected information on over 30,000 farmers. The insurance scheme is backed by policymakers and farmers and is financially backed by the government. The necessary banking and phone infrastructure are in place and there is sufficient data to accurately calculate the crop value at risk, although specific compensation and disaster triggers remain to be agreed. There are no legal objections and it is expected that the scheme will be introduced by mid-2020. Success in Fiji will provide valuable lessons for the rest of the region.

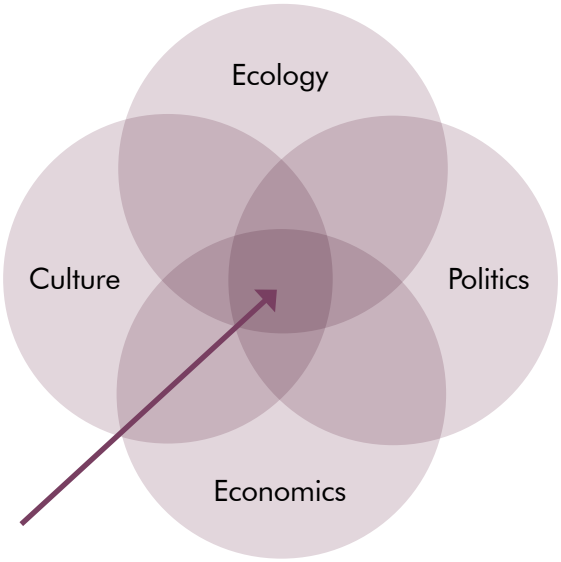
A block insurance valued at FJ$ 1,000 (US$ 458) as opposed to a specific commodity insurance product has been proposed for piloting WIBI in Fiji. Based on the analysis of data for four key crops: cassava, dalo, kava and sugar – the number of farmers producing these crops, the total hectarage, the gross value (establishment costs), the premium remained the same. The block insurance covers all crops in all places which is a major advantage for smallholder diversified cropping systems.

Reaching scale across the PICs to make WIBI possible

The development of an agricultural insurance product is a long-term process that requires stakeholders to work together and pool resources and expertise. Assuming that 40% of the 2.3 million combined population for the seven countries work in agriculture, this corresponds to a farming population of around 900,000. If, on average, there are five members per family, this represents 184,000 farm families. If the insurance take-up is about 20%, this amounts to about 37,000 potential policyholders. The size of the market is not sufficiently feasible to attract private insurance service providers unless there are incentives to attract the majority of farmers. Scalability reduces premium rates and is essential for PICs.

Using the cost of production, as opposed to the full market value of the harvested crop, also makes the premium affordable by reducing the value at risk. Bundling WIBI with other insurance packages such as life insurance could increase uptake. However, governments will be required to fund a national scheme and approve international re-insurance; regionalisation needs to be considered. The goal is to achieve a sustainable insurance product and this requires a balance between politics, economics, culture and ecology (see Figure 1).

Figure 1: The interconnecting domains to introduce a sustainable insurance product



As WIBI has not been actively considered other than in Fiji (Box 1), further work is needed by the other six PICs to achieve the level of understanding and preparedness for considering the introduction of such a scheme.

Kiribati and RMI require considerable additional support to implement WIBI. In both countries, mobile phone penetration in rural areas is low, and commercial farming and farmer organisations are embryonic. Although these island states lie outside the major impact zone for cyclones, both are susceptible to drought and other extreme climatic events, which can lead to flooding, sea level rise and salination, negatively impacting agricultural production.

The Solomon Islands has a high percentage of subsistence farmers but little commercial agricultural development except for oil palm. Mobile phone penetration on the islands is low, especially in the outer islands and rural communities. Detailed costing data for individual crops are not maintained in the Solomon Islands, but there is sufficient information to calculate the total crop value at risk. The meteorological services do not cover all the islands but are able to produce cyclone, drought and rainfall data. It will be more difficult to convince stakeholders to introduce WIBI in the Solomon Islands given their experience with the sovereign risk insurance scheme under PCRAFI.

Opportunities for introducing WIBI in Samoa, Tonga and Vanuatu resemble those for Fiji. These countries have sufficient crop data, although it has not yet been formatted for the purpose of insurance. Vanuatu has considered a drought triggered livestock insurance for the beef industry. There are competent weather authorities in each country and all benefit from good mobile phone penetration and sophisticated mobile banking systems. Farmer associations are small, but insurance could provide the incentive for further development and sustainability. It will be necessary to engage all stakeholders in the WIBI development process to build the capacity of producer organisations and public-private partnerships required, and ensure there is political backing.

Policy recommendations

- WIBI schemes should be made attractive for both the insurer and the producer through the provision of government subsidies of 50-75% or above. Higher subsidies may be needed on introduction of the scheme and these can be reduced once the scheme has proven its worth and the product is better understood and accepted on the market.
- Consider the introduction of compulsory schemes, particularly where bank loans are required. Government or the banks can make insurance a prerequisite for obtaining a loan.
- Alternatively, link WIBI products with the membership of farmers/industry associations or the purchase of subsidised/unsubsidised key inputs, such as fertiliser or seed. WIBI could also be linked to secure contracts for sale of commodities to ensure a seamless purchase of the product. Governments can also provide tax breaks to insurance companies prepared to offer agricultural insurance.
- Only governments can incentivise the taxation system to attract funding for insurance. A simple method should be used for setting the premium. For example, if the trigger is set at a one-in-10-year event, there is a 10% chance a loss will be incurred in any year. The premium is therefore 10% of the total value at risk (expected loss) plus administration, acquisition costs, volatility and a provision for a return.
- Identify those catastrophic events that only impact agricultural activity. Let farmers participate in deciding the value of the risks. Adopt multi-peril insurance schemes.
- Align local policies and legislation to international standards to allow local insurers to access the international re-insurance market. Build regional coalitions.
- Develop modern and functional databases to collect and distribute funds in a timely manner through existing national banking systems. Improve mobile penetration and banking services in outer islands and rural communities.

Conclusions

In many PICs, the concept of insurance is still unknown; however, it needs serious consideration in a region where natural disasters are increasingly severe under a changing climate. Several options should be explored, and a comparative analysis conducted between different WIBI products whilst taking cultural and societal factors into account. Lessons learned from other countries suggest that bundling weather index insurance with other packages, e.g. life insurance and loans work best. Research on introducing WIBI for the seven PICs suggests that stakeholders would prefer a scheme that pays farmers directly and think it should be considered. The specific product should be a multi-peril policy, covering covariate risks – those that affect many people at the same time. Producers should be willing to pay for the insurance, and government subsidies are vital.

Progress has been made in Fiji to support the piloting of a WIBI product for small-scale farming systems in the Pacific. Crops with similar damage characteristics can be aggregated and a lump sum paid out to farmers based on the crop rehabilitation cost, including labour, once a trigger is breached. However, making timely WIBI payments to farmers would require reliable mobile phone network coverage in rural communities and operational and attractively priced and accessible mobile banking schemes. It is also essential that quality weather data that is continuously assessed is readily available; regional agencies should be able to assist each country, working in collaboration with the local competent authority. WIBI is very different from traditional indemnity insurance and it may also be necessary to write new legislation.

Encouraging and working with farmers to participate in insurance schemes and developing their capacity as well as those of extension services is a must. Strong public-private-producer partnerships are needed for WIBI to be successful.

About the project

The project "Leveraging the Development of Local Food Crops and Fisheries Value Chains for Improved Nutrition and Sustainable Food Systems in the Pacific Islands with a focus on Fiji, Kiribati, Marshall Islands, Samoa, Solomon Islands, Tonga, and Vanuatu" is co-funded by the International Fund for Agricultural Development (IFAD) and the Technical Centre for Agricultural and Rural Cooperation (CTA) and is implemented in partnership with the Pacific Islands Private Sector Organisation (PIPSO). The goal is to strengthen the capacity of the Pacific Island governments, farmer and private sector organisations, and sub-regional institutions to develop strategies and programmes – as well as mobilise financing – that can increase poor rural people's access to nutritious and healthy food. CTA has overall responsibility for the implementation of the project.

About the project partners

IFAD
Investing in rural people

The International Fund for Agricultural Development (IFAD), a specialised agency of the United Nations, was established as an international financial institution in 1977 as one of the major outcomes of the 1974 World Food Conference.

PIPSO
Pacific Islands Private Sector Organization

The Pacific Islands Private Sector Organization (PIPSO) is the premier private sector representative body in the Pacific Islands region. It was set up through the mandate of the Forum Economic Ministers in 2005, and legally established in 2007, to be the representative body of the Pacific region's private sector.

Further reading

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Technical Centre for Agricultural and Rural Cooperation
P.O. Box 380 - 6700 AJ Wageningen - The Netherlands
Tel: +31 (0) 317 467 100 | E-mail: cta@cta.int | www.cta.int

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