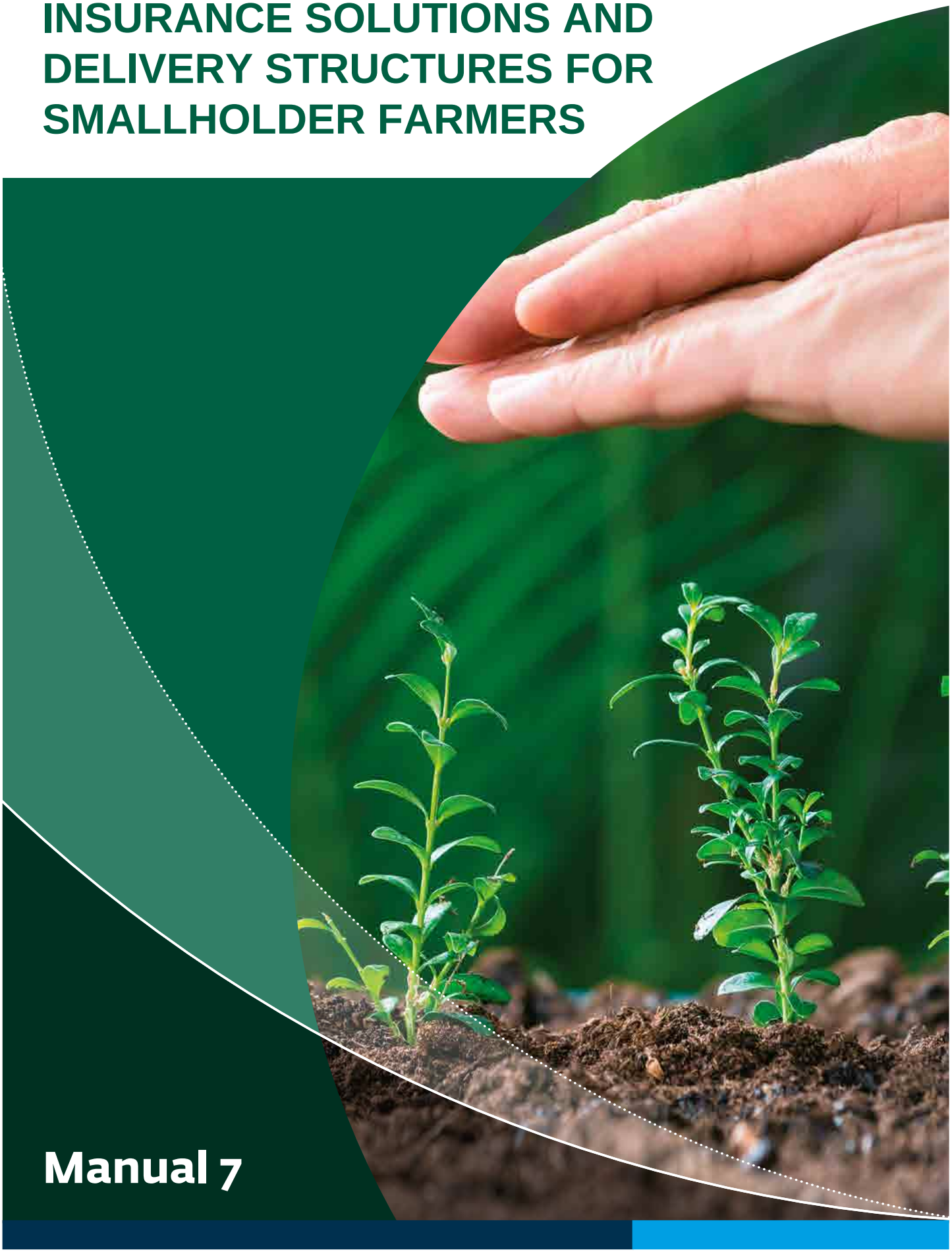
INSURANCE SOLUTIONS AND DELIVERY STRUCTURES FOR SMALLHOLDER FARMERS



Manual 7

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Preface and Acknowledgements

Agriculture insurance manuals were prepared by IFC for the development of agri-insurance markets where the public and private sectors work together in a partnership (PPP). The manuals are designed to strengthen the capacity of the government and market players to effectively design agri-insurance products, both traditional indemnity and index, introduce them to the market, and build sales. The manuals are designed to be succinct yet at the same time sufficient to create the technical and administrative foundation for a modern agri-insurance system, and to allow programs in early stages of development to properly plan the required system. Finally, the manuals are designed to train practitioners, to build local capacity for skills that are required to start the program, and to enable the program to grow over time.

The IFC Europe and Central Asia Agri-Finance Project implemented by IFC a member of the World Bank Group, in partnership with the governments of Austria and Hungary has initiated and issued this manual to share the knowledge and build capacity of agri-insurance market stakeholders. The Project covers Ukraine, Central Asia, Azerbaijan and the Western Balkans and is led by the Project Manager, Leah Soroka. The Project aims to contribute to development of a sustainable agricultural finance system. This approach will help to launch innovative financing and risk management tools designed particularly for financial intermediaries lending to the sector and required instruments to improve their risk management in agriculture.

The entire agri-insurance team in Ukraine, Azerbaijan and Kosovo made practical contributions to the manuals. A special recognition is expressed to Lysa Porth, Ph.D. MBA, Associate Professor and Guy Carpenter Research Chair in Agricultural Risk Management and Insurance in the Warren Centre for Actuarial Studies and Research, I.H. Asper School of Business, University of Manitoba, Canada and Andrey Zaripov, agri-insurance specialist and a member of the GIIF team for helping to develop manuals. The information in this manual is based in part from Lysa Porth's current and past research, both published and working papers. Lysa Porth would also like to acknowledge the helpful input from her colleagues at AgRiskCentre.com.

1.0. Introduction

The objective of this Manual is to outline possible crop insurance solutions that are appropriate for smallholder farmers, defined here as farms that are less than five hectares. The document is organized as follows. The first section provides an overview of smallholder farmers, including the complex environment in which they operate and the challenges this presents in terms of developing commercially-viable crop insurance schemes. Next, the report provides a discussion of possible insurance solutions suitable for smallholder farmers. Following this, an overview of possible delivery structures for the proposed insurance solutions is provided, including not-for-profits, for-profits and government, along with associated advantages and disadvantages of each. A summary section concludes the report.

2.0. Smallholders

In the context of food security, and the challenges faced in terms of feeding a growing population, increased volatility of commodity prices, and potential changes in climate, efforts to improve access to agricultural insurance are a major focus in countries around the world. In countries with more developed crop insurance programs, traditional multi-peril crop insurance is generally most prominent. These programs provide coverage for individual farmers, where crops are insured on a crop-by-crop basis and loss adjustment is carried out at the farm-level. However, traditional multi-peril crop insurance programs often have relatively high administration costs, and of literature has reported information asymmetries due to the occurrence of moral hazard (where farmers change their behavior once being insured) and adverse selection (where the farmer being insured has more information about their own risk characteristics relative to the insurer). Together these issues have generally made traditional multi-peril crop insurance programs too expensive for governments in low- and middle-class countries, particularly where farm sizes are relatively small making the administration component of too costly in many cases.

Farmers of relatively small farm sizes are sometimes referred to as smallholders. Smallholders are often defined as those producers with farmland smaller than 1 hectare, or in some literature as those farming less than 5 hectares. In the context of this report, we are interested in farmers operating farms less than 5 hectares. This compares to farm sizes in Canada, for example, where more than 80% of farmers operate farms larger than 1000 hectares, and approximately 25% of these farms are larger than 5,000 acres.

It is estimated that there are approximately 475 million smallholder farmers globally (IFF, 2017), providing 80% of the food consumed in low-income countries (IFAD, 2017). These smallholders are particularly vulnerable, and providing agricultural insurance opportunities will help to prevent these farmers from further exposure and will have a major impact on economic development and food security. Typical constraints of smallholders include limited farming knowledge, production and price uncertainty, difficulties in market access, and generally poor access to credit, among other limitations. Well-functioning agricultural insurance programs can help facilitate production, and can reduce income uncertainty. For example, when farmers experience crop loss due to unexpected events, they receive an insurance payout. In addition, insurance can help producers gain access to suppliers and banks if it is viewed as a form of collateral. For example, insurance can directly reduce uncertainty due to an unexpected shortfall in production, where farmers receive insurance payments in times of crop loss. In addition, access to means of production can be improved based suppliers and banks, for example, that are willing to accept insurance as a form of collateral.

The next section will discuss potential insurance solutions suitable for smallholder farmers, followed by an overview of possible delivery structures for the proposed insurance solutions, including not-for-profits, for-profits and government.

3.0. Insurance Solutions

In this section, possible insurance products are first described based on the targeted customer. Following this, three main types of insurance solutions are discussed, including traditional indemnity-based, index-based and broader risk management strategies that combine agricultural insurance with other tools and approaches.

3.1. Classification of Insurance Products Based on the Targeted Customer

Insurance products may be classified based on the type of farmer they target, including micro-level, meso-level and macro-level. Each is briefly described next.

3.1.1. Micro-level

Micro-level products are directed towards farmers, households or small business owners, who seek insurance to protect themselves from potential losses, often due to adverse weather events. This provides a mechanism to help manage low-to-medium frequency covariate risks. The goal with micro-level products is to help facilitate access to credit, encourage investment in higher-quality inputs, and to provide some protection to those with loans to avoid default and to restart production in the case of severe weather events.

3.1.2. Meso-level

At the meso-level, the insurance product is targeted to those groups that are risk aggregators, such as farmers' associations, input suppliers, banks, etc., for protecting their members, assets, or loan portfolios, respectively.

3.1.3. Macro-level

Insurance can also help governments and other relief agencies respond to disaster situations. In this case, insurance can help avoid allocating unforeseen funds from the fiscal budget, allowing to plan ahead of crisis.

The focus of this report is on micro-level products, which aim to provide protection primarily to individual farmers.

3.2. Main Types of Insurance Products

To date, a variety of approaches have been tried, with limited successes at the commercial scale, to target smallholder farmers and help protect their vulnerability. The three main types of insurance products discussed here include, traditional indemnity-based insurance, index-based insurance, and broader risk management strategies, which combine agricultural insurance with other tools and approaches.

3.2.1. Traditional Indemnity-Based Insurance

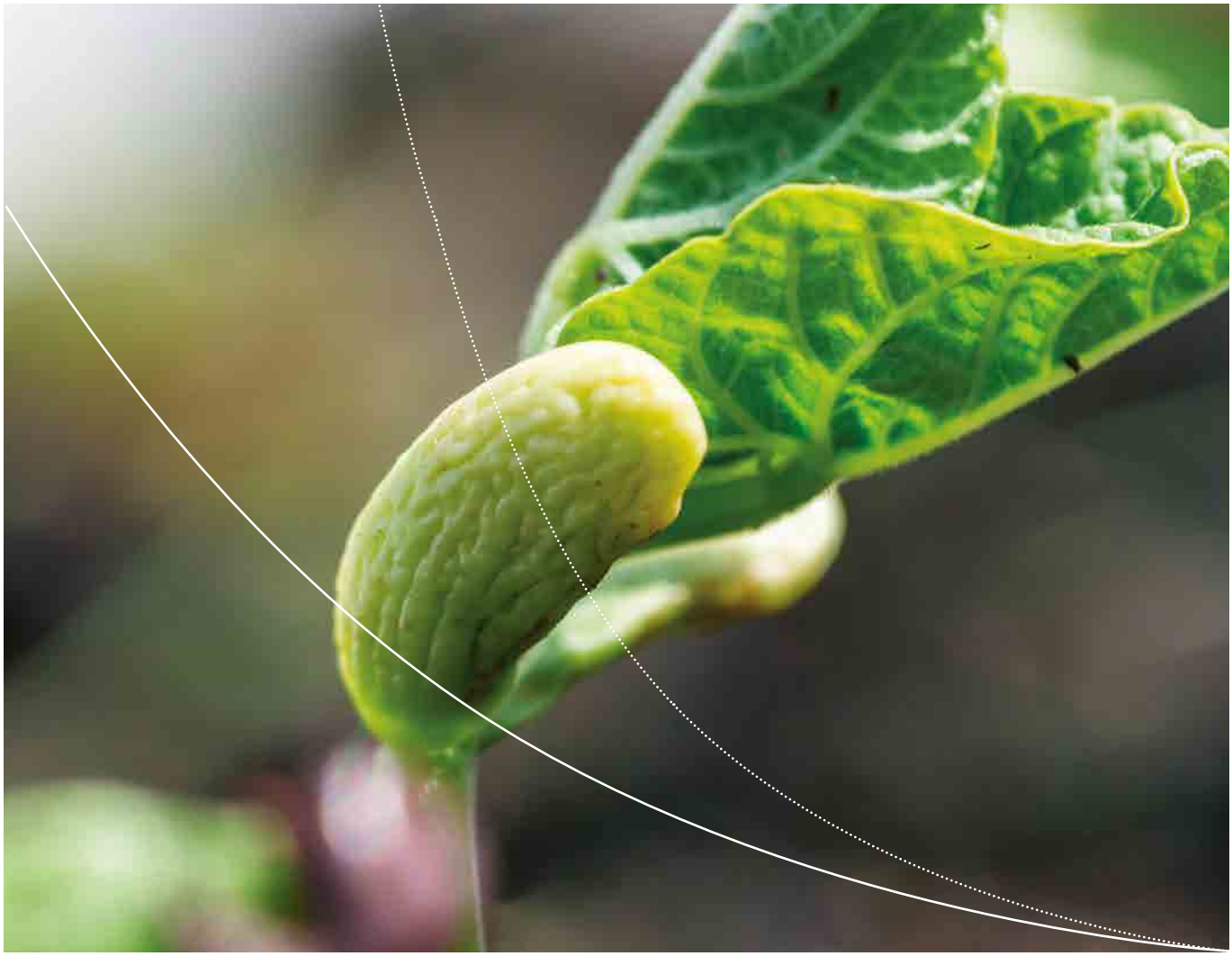
Traditional indemnity-based crop insurance programs cover individual farmer-level losses. There are several forms of traditional indemnity-based crop insurance programs, including named-peril and multi-peril, among others, however, multi-peril is the most common. Multi-peril crop insurance, which insurers on a crop-by-crop basis and covers all risks, determines the payout to a farmer based on the actual loss adjustment carried out at the farm. When farm sizes are small, as is the case discussed in this report, the administration in terms of underwriting the policies and adjusting the losses can be cost prohibitive. Further, as discussed above, the difficulties regarding moral hazard and adverse selection can severely limit the longer-term success of this type of insurance scheme. Therefore, there

are few cases in which private insurers offer crop insurance to smallholders, with the exception of a few situations where coverage is limited to specific perils, such as hail or frost damage, and availability is mostly for commercial farmers for high-value crops. Much research, therefore, has suggested that crop insurance solutions for small-size farmers should be based on indexes.

3.2.2. Index-Based Insurance

As an alternative to traditional indemnity-based insurance programs, index-based approaches have received considerable attention. Index insurance works by linking an index that is highly correlated to farm yields. Indemnities are paid to producers based on losses computed by the index, rather than the specific farm, and this eliminates the need for on-farm loss adjusting. Given that the index is independent of the farmer's behavior, moral hazard issues are theoretically avoided. In addition, the underlying index can be designed so that it is transparent and verifiable by the producer, and insurance payouts can be made in a relatively timely manner. In addition, index-insurance schemes often have greater capacity in terms of reinsurance, given the reduction in moral hazard and the transparency of the index.

Despite the many benefits, however, index-insurance is presented with a new challenge, which is referred to as basis risk. Basis risk can be defined as the mismatch between the underlying insurance index and the loss suffered on the farm. This can lead to the situation where the farmer experiences a loss on the farm, yet, does not receive an insurance payment. In addition, the farmer may receive an insurance payout despite no loss experienced on the farm. In general, basis risk can be defined as spatial, temporal or variable. Spatial basis risk refers to when the outcome at the farm differs from the measure based on the index. In this case there is low sensitivity between the farm yield and the data used in the index (often weather data generated from meteorological stations), which may be situated at considerable distances from the farm. Temporal basis risk is when there is low correlation between the index and crop yield due to the timing of the occurrence of the insured event. The temporal component of the basis risk is related to the fact that the sensitivity of yield to the insured peril often varies over the crops' stages of



growth. Factors such as changes in planting dates, where planting decisions are made based on the onset of rains, for example, can have a substantial impact on correlation as they can shift critical growth stages, which then do not align with the critical periods of risk assumed when the crop insurance product was designed. Variable basis risk is when the relationship between the loss and the indexed peril is not straightforward, due to the presence of other important risks. For example, yield loss may be more due to wind speed during flowering rather than quantity of rainfall or relative humidity.

Much research has therefore, focused on improving technical and design processes with index-based insurance products to minimize basis risk. There are several possible sources of data to construct the underlying index for an index-based insurance scheme. Most commonly this may include data obtained from weather stations, and more recently focus has been on data obtained from remote sensing technologies.

3.2.2.1. Weather Stations

Weather stations have traditionally been the primary data source for agricultural index insurance programs. However, in many cases there are limitations in terms of the density of weather stations, and possibly the weather time series available from each station. In most cases, research has focused on various interpolation techniques to help address this in order to enable the prediction of values at an unmeasured location using known data belonging to its neighborhoods. The most common interpolation method is the Inverse Distance Weighting (IDW) approach, which averages weather data from all nearby sample stations. This method has been used extensively in geospatial analysis primarily due to its simplicity, and in general this approach has been successful. However, drawbacks of the IDW method include that the accuracy relies strongly on the density of the meteorological stations.

A more sophisticated approach is kriging, and this method may help to address some of the shortcomings of IDW. Rather than using distance to determine the weights in the model, the focus is on minimizing the variance of the

estimator. Once the number of weather stations to be used is determined, all kriging estimates are computed using a function with the following form:

$$\hat{Z}(x_0) - \mu = \sum_{i=1}^{n} \omega_i [Z(x_i) - \mu(x_0)]$$

where (x_0) is the local mean within the search window and is the average of the data across the entire domain. Therefore, one of the benefits of this method is that spatial variation is taken into consideration.

There has been several studies that have used kriging for application in weather index insurance. For example, Sun et al. (2003) use kriging to provide the delineation of raining areas in Australia. Paulson and Hart (2006) using kriging based on a Markov Chain Monte Carlo method to interpolate rainfall for farm pasture owners in Iowa. The results appear to be mixed in terms of the best approach to use. Paulson and Hart (2006) show that kriging and IDW reduce spatial basis risk to about the same extent. However, Li et al. (2006) and Cao et al. (2014) find that kriging provides more accurate precipitation estimates. The major disadvantage to kriging is that it is more complex and requires more computation power and time.

3.2.2.2. Remote Sensing

While interpolation can help to address some of the difficulty regarding limited or missing data, the low density of weather stations remains a major issue. As a result, remote sensing has received more focus as a possible alternative. In general, there are two main types of indices that can be calculated based on satellite imagery, including vegetation and biophysical parameter indices. The Normalized Difference Vegetation Index (NDVI) is the most commonly utilized vegetation index, and there are several

operational NDVI programs in Spain, Mexico, USA, and Canada. Despite the widespread use of NDVI, there are a number of limitations, including that it can be quite sensitive to sensor effects, lighting conditions, atmospheric conditions and soil effects. A second approach is based on biophysical parameters. Commonly, biophysical parameters include the Fraction of Absorbed Photosynthetically Active Radiation (FAPAR) and the Fraction of Green Cover (FCover). In contrast to NDVI, these parameters provide physically meaningful measures of the vegetation (Asner, Wessman and Archer, 1998; Running et al., 2004). These biophysical parameters have been shown to be less sensitive to sensor effects, and they are more stable across time and space. This may mean that it is more likely to obtain sufficient historical time series of biophysical parameters to help design and price an index-based insurance policy.

3.2.3. Broader Risk Management Strategies that Combine Agricultural Insurance with Other Tools

When uncertainty from lack of harvest is the main concern among farmers, then a properly designed and cost-efficient crop insurance program can have a substantial impact on improving the livelihoods of smallholders. However, in other situations crop insurance has a less direct impact unless it is closely integrated into the supply chain of agricultural credits and inputs. Some research suggests that broader risk management strategies, which combine agricultural insurance with other tools and approaches, has the highest probability of succeeding when dealing with smallholders. The most common additional services include credit and extension and marketing services. In addition, linkage with lending institutions that are willing to extend agricultural credit in a timely and cost effective manner can lead to improved demand. In some cases, agricultural insurance may be compulsory for smallholders with agricultural loans, and these credit-linked policies may offer new opportunities for improved growth in the agricultural insurance sector.

4.0. Delivery Structures

When designing an agricultural insurance program, and important element is considering the possibly delivery structure of the insurance. This is important from the perspective of regulatory requirements as well as computing premiums, among other considerations.

The procedure for setting premiums is referred to as ratemaking, and is identified by the Casualty Actuarial Society (CAS) as an estimate of the expected value of future costs. The main component for the ratemaking procedure is the provision for losses. In crop insurance, the expected loss is typically modelled using the loss cost ratio (LCR), also known as the loss ratio (LR). This is the ratio of indemnities to liabilities. In addition to the expected loss, the total premium typically includes a loading charge, which is often dependent on the delivery structure of the program. For example, in the case of a private insurance firm, loading costs may include costs associated with writing the policies, such as administrative expenses, along with uncertainty and profit loadings, and possibly other charges, such as product research and development, cost of contingent capital, return on equity, etc. In the case where government delivers the insurance, as with crop insurance in Canada, loading does not account for profit. Instead, premiums are set to recover losses over the long-term and to maintain a sustainable program by paying off any program debts and maintaining a reasonable reserve.

There are several possible insurance delivery structures that can be considered in most countries, including "not-for-profits", "for-profits," and "government." Each of these types of delivery structures likely require some level of reinsurance. For each of the three structures described below, the associated advantages and disadvantages are discussed. This summary is relatively high-level, and more research is needed on the possible delivery structures based on the requirements of a specific crop insurance product.

4.1. Not-for-Profits

Not-for-profit insurance structures, such as mutual, reciprocal, cooperative, or new generation cooperative insurance companies, may have some advantages in regulatory structure, taxation, control, or other advantages compared to for-profit insurance structures. In addition, farmers may benefit by receiving dividends or reduced premiums in the future if the insurance company generates profits or excess reserves/surplus. Another main benefit is that farmers are directing the insurance company from which they buy insurance, so there is more flexibility in designing the insurance policies to suit their needs, as well as control over how the insurance company is operated.

Not-for-profit insurance structures may also benefit from more favorable regulatory requirements, and in some cases there may be some tax advantages. All insurance structures, however, must adhere to regulatory requirements regarding minimal surplus or reserve. While a mutual insurance company may have difficulty raising capital (reserves) because premiums are used to fund surplus, reciprocals and cooperatives may not face the same challenge because additional capital sources can be accessed to establish surplus and assist in start-up.

4.1.1. Mutual Insurance Company

A mutual insurance company is a cooperative structure, which is completely owned by its policyholders, and funds are raised through premiums.

As owners of a mutual company, policyholders have the right to vote for the board of directors and other major business decisions. Typically each policyholder receives one vote, however, an alternative (if permissible) may be to provide votes based on the amount of insurance purchased, so that those purchasing more insurance would receive more votes. A major advantage of a mutual insurance company is that policyholders are entitled to share in the surplus funds or profits to directly benefit from the long-term financial stability of the company. The profits can be returned to policyholders as a dividend or future premiums can be reduced. Another advantage of a mutual insurance structure is that there are typically less regulatory requirements compared to for-profit insurance companies. One difficulty with a mutual insurance company structure is that it can be short of capital and find it difficult to raise capital to support company growth or cover larger than expected losses.

4.1.2. Reciprocal Insurance Company

A reciprocal insurance structure shares risk equally among its members. Members agree to pool risk by acknowledging a reciprocal agreement regarding indemnity, thereby attaining a preferred level of risk pooling and diversification in order to indemnify the other members. The subscribers are part of an association in which the amalgamated risks are exchanged in order to cross-insure each other. This agreement makes each member an insurer of an insured by each entity in the reciprocal exchange (each subscribing member exchanges a contract of indemnity with each other). This is in contrast to traditional insurance, that places the risk up on the insuring company.

Reciprocal insurance exchanges, therefore, are unincorporated entities that operate through legal agreements, and individual members are referred to as subscribers. Subscribers sign an indemnity agreement and pay premiums into an allocated account. When a loss is suffered by the subscriber the pooled premiums are used to pay the claim. The liability of each member is limited to the cost of their individual policy. An attorney-in-fact is hired to manage the overall administration, promotion and underwriting. The major advantage of this structure is the flexibility and focus upon the policyholders, and efficient operation of the exchange, which helps to keep fees and expenses at a minimum. However, a disadvantage is that all members must accept a certain level of liability. However, risk reduction steps can be taken, such as the purchase of reinsurance, to limit this liability.

4.1.3. Cooperative Insurance Company

A cooperative is a jointly owned enterprise that engages in the production or distribution of goods or services, operated by its members for their mutual benefit. In the case of crop insurance, the cooperative would typically be owned by farmer members purchasing the crop insurance, and they would have one vote per member. Insurance cooperatives are very similar to mutual insurance companies, with the main difference being attributed to ownership. While a mutual insurance company must be owned by its policyholders, a cooperative insurer can be owned by either its customers (members) or by cooperatives that may or may not be its customers. The members benefit from products and services that are customized to suit their needs, as well as profits (through dividends) that are distributed to members based on the amount of business they do with the cooperative.

4.1.4. New Generation Cooperative Insurance Company

A more recent specific form of a cooperative is a "New Generation Cooperative (NGC)," and this may also be a possibility for an insurance structure. This structure may be especially of interest if a cooperative

structure is desired, and if the cooperative requires significant equity at the start-up or beginning stages (e.g. to obtain insurance reserves or capital).

A main advantage of new generation cooperatives is that they can issue various types of shares to raise equity. Depending on the jurisdiction/location, there are a number of characteristics that differentiate new generation cooperatives (NGC's) from traditional cooperatives, including: 1) NGC's can issue designated shares with rights and obligations, 2) NGC members and non-members may hold additional levels of equity by purchasing investment shares, 3) NGC membership may be limited to those holding designated shares, 4) NGC members wishing to retire or exit farming could access their equity in the insurance company by selling their shares.

It may also be possible for preferred shares to be issued. These share behave like debt instruments, although legally are considered equity. For example, the preferred shares can be held to maturity, or sold to other investors before they mature. Also, preferred shares pay a dividend instead of interest, and this provides some tax advantages. However, dividends cannot be deducted from taxes for the cooperative, unlike interest on debt. There are different approaches regarding the availability of preferred shares, ranging from being available only to farmers, or open to all investors to access a broader capital base.

4.2. For-Profits

For-profit insurance structures may find it easier to raise capital, however, a main possible disadvantage is that a profit loading is included in premiums, and this may increase the cost of premiums. Some examples of for-profit insurance companies include those firms traded on stock exchanges. However, a farmer owned shareholding insurance corporation is also possible. Another disadvantage of the for-profit structure is that some jurisdictions require that a premium tax is paid.

4.2.1. Farmer Owned Shareholding Corporation

A farmer owned shareholding corporation could issue common shares (regular shares), which are purchased only by farmers by restricting share sales to farmers (crop insurance buyers or others). The company could also possibly issue bonds or preferred shares, or borrow from banks. One advantage of a farmer owned shareholding-company is that farmer owners may make a small profit (dividend) in exchange for providing capital. A main advantage would be that they are controlling the insurance company from which they buy insurance, so can direct it according to their needs.

4.2.2. Private Insurance Company

This would require using a licensed insurer, and insurance paper involving a private insurance company. Farmers would benefit by serving only as customers, so there would be no operational concerns or liability issues for the farmer. The insurance company would provide the insurance/reinsurance capacity and handle remittance of premium taxes, regulatory filings, provide the insurance policy, and potentially handle the claims settlements/payments. The disadvantage is that there would likely be a higher premium cost to farmers, called a "fronting" fee, which is usually 6% to 8%, in order to make profits for its shareholders. This insurance structure may also have to pay more for reinsurance, as it would likely be ineligible for possible lower cost government risk backstopping or assistance with administration costs. Another disadvantage may be that the insurance would have to be distributed by a licensed insurance broker, depending on the jurisdiction, and so this could also contribute to higher premiums for

farmers. In addition, there may be a premium tax to be paid in some jurisdictions, which would further increase the cost.

4.3. Government

It may be possible to have government deliver the crop insurance product directly to producers. The benefit is that this structure may be more trusted by agricultural producers. This structure could also be advantageous if government is willing to pay for administration costs or assist with reinsurance, or provide a loan as reinsurance, or assist in risk backstopping. This insurance structure is also non-profit, and some producers may feel government could provide lower cost premiums. Also, in most jurisdictions, government crop insurance companies would be exempt from any premium tax, and so this could reduce the premium. A disadvantage is that farmers may not have as much flexibility or control over the insurance policies developed or how the insurance is operated, and some farmers may prefer not to have government delivered insurance. Some producers may feel that government could be less efficient, as a monopoly, and not subject to competition, and so could not bring about lower cost and innovation. Another disadvantage is that government may take more time to launch the insurance, and may require more time to agree upon logistics, administration, agreements, etc.

5.0. Global Examples of Delivery Structures

In this section, some global examples of the non-profit delivery structures discussed above are presented for further consideration. This includes a Mutual Insurance Company, Reciprocal Insurance Company, and New Generation Cooperative.

5.1. Mutual Insurance Company

A mutual insurance company is owned by its policyholders, and profits are kept within the company or given back to policyholders as dividends or reduced future premiums. There has been widespread use of mutual insurance companies worldwide. However, as discussed above, there has been a trend in more recent years towards demutualization in order to convert to a for-profit share-holding company, so that policy holders could access their large amounts of equity that may build up over time.

One example of a mutual insurance company is Portage Mutual. Portage Mutual provides several choices for structuring farm insurance, including home and personal property, farm property, equipment and tools, livestock, business interruption, farm liability, etc. (http://www.portagemutual.com/Products/agricultural.aspx).

A second example of a mutual insurance company is the Mutuelle Agricole Marocaine D'Assurance (MAMDA), which is responsible for delivering the Morrocan Rainfall Index Insurance program. MAMDA also manages the state sponsored Drought Program. See Design and Use of Weather Derivatives in Agricultural Policies: the Case of Rainfall Index Insurance in Morocco (Stoppa and Hess, 2003).

5.1.1. Reciprocal Insurance Company

Reciprocal insurance structures have gained interest in recent years, particularly in the case of non-traditional risks where it can sometimes be difficult to arrange placement of insurance and reinsurance. A reciprocal is unincorporated, and represents an association of members who exchange insurance contracts of indemnity with each other. While reciprocals exhibit some similarities with mutual insurance companies, a main difference is that a mutual is normally incorporated, while a reciprocal is generally unincorporated as mentioned above.

One example of a Reciprocal Insurance Company is the Poultry Insurance Exchange Reciprocal of Canada (PIEX). PIEX was designed for broiler breeder producers who were in full compliance with biosecurity requirements. This involved the development the development of an administration structure, the Poultry Insurance Exchange (PIE), and funding of a reciprocal. The development of the reciprocal with its associated self discipline resulted in the attraction of the reinsurance market. Poultry producers control the Board of the PIE and can thus adjust the policy based on their needs.

A second example of a Reciprocal Insurance Company is the Canadian Egg Industry Reciprocal Alliance (CEIRA). CEIRA currently provides property and insurance covering certain losses due to Salmonella enteriditis (SE) for producers in the Canadian regulated egg supply chain. CEIRA has approximately 700 members, with members in all provinces and the Northwest Territories (http://www.ceira.ca).

5.1.2. New Generation Cooperative

A New Generation Co-op (NGC) is a legally incorporated business arrangement that uses its membership to control the business. NGC's can be used to expand the scope of a business through a form of vertical integration. This is achieved using delivery rights and obligations, and in this way are sometimes viewed as hybrids between traditional co-ops and limited companies. In the 1990's NGC's gained popularity, particularly for value-added agricultural processing and marketing.

Two examples of NGC's are provided next, including a processing a processing co-op and egg co-op. In the 1990's processing co-op's became more prevalent, and investors were brought together to either buy or build a processing plant. Under this arrangement, members purchased the right (and obligation) to deliver product to the plant. This was established using designated shares and marketing agreements. Upon delivery, members would pay an initial market price, and at the end of the year the members would pay a "patronage" premium, which was considered a return on investment. Westlock Terminals (www.westlockterminals.com) is one example of a processing co-op. In this example, more than one million dollars was raised by local investors to purchase a grain elevators. They felt that they could vertically integrate to handle, blend and market preserved (IP) varieties and grades to earn more profits.

The Alberta Egg Producers Co-op is another unique example of a NGC, which was organized with the help of accounting firm Meyers Norris Penney and other professional advisors. This NGC brings together more than 100 egg producers with Vanderpol's Egg Products Inc. from Abbotsford, BC. Their Airdrie egg processing plant has been in operation since 2003 (http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/bmi6646/$FILE/new-generation-co-op-fits-the-bill.pdf).

6.0. Summary

Developing sustainable and commercially-viable agricultural insurance for smallholders is a challenging task. A particular difficulty is the high administration costs associated with reaching scattered small and marginal farmers, which can lead to significantly higher premiums. These premiums tend to be highest for traditional indemnity-based insurance designs, and have the potential to be more cost efficient for index-based insurance products. However, even with carefully designed index-based policies that leverage new technologies and minimize basis risk, agricultural insurance may need to be packaged with other services to create more value for smallholders and improve demand. For example, linkage with credit and extension and marketing services has the potential to lead to more positive development. Several possibly delivery structures were presented in this report, including not-for-profit, for-profit and government, along with a discussion on several associated advantages and disadvantages. **It is recommended that not-for-profit insurance structures be more carefully examined, such as mutual, reciprocal, cooperative, or new generation cooperative insurance companies, in order to achieve cost-effective solutions for smallholders.** These types of delivery structures may have several advantages in terms of regulatory structure, taxation, control, or other advantages compared to for-profit insurance structures. In addition, farmers may benefit by receiving dividends or reduced premiums in the future if the insurance company generates profits or excess reserves/surplus. Another main benefit is that farmers are directing the insurance company from which they buy insurance, so there is more flexibility in designing the insurance policies to suit their needs, as well as control over how the insurance company is operated.

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