



B A S I S

BASIS AMA Innovation Lab  
University of California  
Davis, CA 95616  
+1.530.752.7252

## Field trip report – Agricultural Insurance in Nepal (May 25<sup>th</sup> – June 4<sup>th</sup>)

Michael Carter, Director of BASIS

Lena Heron, Rural Development Advisor at USAID

Tara Steinmetz, Assistant Director of BASIS

Thomas Barré, Post-Doctoral Fellow at I4/BASIS

### Summary and chief conclusions

The objective of this field trip was to determine where (which activities/regions/etc.) the development impacts of insurance-based risk management strategies would be maximized and where we would have enough data available to develop a product. In particular we investigated:

(1) *the existing agricultural insurance programs in Nepal.*

We found that given the existing livestock insurance schemes offered to farmers (through DCGC, ADBNL, and insurance companies) and their adequacy in meeting farmers' needs, we feel that our efforts in the next steps of our work should focus on crop insurance. Indeed, crop insurance remains underdeveloped in Nepal.

(2) *the extent to which production risk impacts farmers' ability to generate higher incomes.*

We found that weather and disease are important factors limiting crop farmers' access to credit and capacity to invest in new technologies. In particular, rice farmers are highly dependent on the timing and intensity of the monsoon, winter maize yield is very sensitive to cold temperatures and vegetable farmers can experience diseases and hailstorms that impact production.

(3) *the existence of appropriate technologies to mitigate these risks and generate higher incomes.*

We found that cereal crop (rice and maize) could strongly benefit from the adoption of hybrid seeds while vegetable farmers may benefit from investments on their land (seeds, irrigation, plastic sheets, etc.).

(4) *the availability of historical yield data and the consequences for index design.*

We found that yield data are very scarce in Nepal. But remote-sensing solutions for cereal crops yield prediction could be a solution to data scarcity; while administrative and survey data are not enough for the development for area-yield indices, they could allow us to calibrate a satellite-based index. Furthermore, the organization of vegetable farmers around collection centers might give us the opportunity to build index insurance for vegetables.

Hence, while further analysis is being conducted in preparation for the final report of the first stage of our feasibility study, we consider that rice, maize and vegetables are the most promising crops that should be carried into stage 2.

The remainder of this trip report is organized as follows: Section 1 lists the different stakeholders we met during the field trip. Section 2 reviews the regulatory environment for insurance in Nepal. Section 3 describes the most important insurance scheme already in place in Nepal. Section 4 reviews the question of access to credit. In section 5, we review experts' view regarding the role of risk for farmers and the technologies available to help farmers cope with it. Section 6 briefly discusses data issues and their implication for index insurance design.

## **1. Meetings organized**

In order to answer these questions, we met with agricultural sector actors in Nepal. These meetings were an occasion to introduce the concept of index insurance, since most of our interlocutors were not familiar with these tools. The discussion was then oriented towards the kind of risks that farmers face, the risk management strategies they implement to cope with these risks, etc. All of interlocutors have been very knowledgeable of every dimension of our work but we classify them here for clarity (contact details are provided in appendix):

- Regulatory Environment:
  - Ministry of Agricultural Development : Vijoy Kumar Mallick - Joint Secretary, Sunil Kumar Singh- Senior Agro-Economist and Hem Raj Regmi - Senior Statistical Officer.
  - Insurance Board (Beema Samiti): Prof. Dr.Fatta Bahadur K.C. – Chairman and Kundan Sapkota – Deputy Director
- Financial/Insurance sector:
  - Credit and Deposit Guarantee Corporation: Mr. Danda Pani Paudel
  - Sana Kisan Bikas Bank (Small Farmers Development Bank): Jalan Kumar Sharma-CEO, Krishna Prasad Lamichhane-Program Director and Anju Patak-Manager
  - Muktinath Bikas Bank: Til Bahadur Gurung-Chief of Modern Bankg Division
  - Agricultural Development Bank, Branch office in Pokhara: Hari Prasad Parajuli
- Organizations involved in the agricultural sector in Nepal:
  - CIMMYT: Andrew McDonald- Cereal System Initiative for South Asia (CSISA) Project Leader, Cynthia Mathys-Project Manager and M&E specialist, Nirmal gadal-Hill Maize Research Project

- IRRI: Dr. Bhada Prasad Tripathi – Senior Associate Scientist
- iDE Nepal: Luke Colavito-Country Director, Shailendra Shrestha-Marketing Program Coordinator, Bal Krishna-Manager
- Asian Development Bank: Govinda Geawli-Senior Project Officer and Vidhisha Samarasekara - Senior Climate Change Specialist – ADB’s focal point for the Climate Investment Fund (CIF) Nepal’s Pilot Program for Climate Resilience (PPCR)
- Netherland Development Organization (SNV): Piet Visser-Team Leader-Senior Advisor Value Chain Development and Padam Bhusal – Climate Smart Agriculture Advisor
- KISAN – USAID (Knowledge-based Integrated Sustainable Agriculture and Nutrition (KISAN) Project: Erin Hughes-Senior Program officer at Winrock International, Dr. Purushottam P. Mainali- Agricultural Expert, Kailash Rijal-Program Manager at DEPROSC Nepal and Praveen Baidya-Business contracts Director.
- Frankfurt School of Finance and Management: Irene Loder – International Advisory Services

## **2. Regulatory Environment**

In January 2013, The Government of Nepal (through the Insurance Board) introduced crop and livestock insurance directives to encourage insurance companies to develop commercial agricultural insurance. The objective is to offer farmers and investors in the agricultural sector the tools to reduce the risks associated with loss/damage resulting from situations beyond control (such as flood, landslide, drought, excess rainfall, hailstones, snowfall, frost, diseases/pests, earthquake, etc.).

### *2.1. Obligation to offer agricultural insurance*

The directive introduces the obligation for non-life insurance companies to offer agricultural insurance, but the authorities have not aggressively enforced this obligation in order to let insurance companies adapt and learn. The directive also offers guidelines for the insurance policies that insurance companies can use. Insurance companies are also free to submit their own schemes for approval by the Insurance Board.

### *2.2. The Subsidy scheme*

The Ministry of Agricultural Development introduced a subsidy on the premium paid for insurance of crop and livestock in June 2013. The government provides a 50 percent subsidy on insurance premiums

paid by individual farmers, farmers' groups and farmer cooperatives. The maximum value at risk for this subsidy program is Rs. 10 million (USD 100,000). This subsidy scheme is scheduled to stop after 5 years; insurance policies will have to reach sustainability by that time.

In this fiscal year (2013/14), only Rs.135 million of subsidies on insurance premium have been allocated, corresponding to less than 20% of the budgeted amount (USD 1.3 million). In response to this low disbursement level, the subsidy will be increased to 75% next fiscal year and the overall budget will be cut in half (to USD 650,000).

Indeed, while 17 out of 19 non-life insurance companies have offered agricultural insurance this year, they typically only offer coverage for livestock producers, but do not offer coverage for cereal crops, fruits or vegetables.

### *2.3. Non-regulated Insurance*

Other entities are allowed to offer insurance-like products to farmers. Because they are not insurance companies, they do not have to comply with rules that apply to insurance companies (licensing by the Insurance Board, minimum capital, solvency requirements, etc.). These programs, led by the Credit and Deposit Guarantee Corporation and the Agricultural Development Bank (public owned financial institutions), also benefit from a 50% subsidy from the government. This subsidy program is separate from the insurance companies' subsidy scheme and is not scheduled to stop anytime soon. We discuss these programs further in the next section (3.2).

## **3. Agricultural Insurance Products in Nepal**

### **3.1. Regulated sector (Insurance Companies)**

*Supply side:* Agricultural insurance is a very new activity for private insurance companies in Nepal. Indeed, before 2013, insurance companies were not involved in this sector. Because it is a new activity for them and they lack of expertise in agricultural risk management, insurance companies often only offer livestock insurance. Indeed Nepal has a long history of non-regulated livestock insurance schemes so that the risks are well-known. Also, livestock is often seen as more valuable and easier to monitor than crops. An initial visit by a veterinarian to verify the animal's health, and a follow-up if the farmer fills an indemnity claim is enough to verify if indemnities are due or not. In the case of crops, it is harder to determine that losses are due to factors outside of the farmer's control and that the farmer did his best to get a good harvest (with use of quality inputs like seeds and appropriate timing of planting, etc.), so insurance companies have difficulties evaluating the risk attached to crop production. Programs of

training of trainers are being implemented by the Ministry of Agricultural Development and the Insurance Board to solve this issue.

*Demand side:* Farmers are often not aware of the government scheme for crops and livestock, and the scheme proposed by the government might seem overwhelmingly complicated to Nepalese farmers. Also, Nepalese farmers (mostly livestock farmers) already benefit from other insurance schemes that are highly subsidized by the government, so that private insurance companies cannot offer a comparable value-for-money.

### 3.2. Non-Regulated Sector

#### *Deposit and Credit Guarantee Corporation (DCGC)*

The DCGC is a public institution held by the Government (90%) and the Central Bank (10%). Its primary role is to insure credits and deposits for banks and other financial institutions. Its role in the agricultural sector is mainly to cover loans, but it can also insure individual livestock farmers directly if they own more than 10 cows.

*Credit guarantee cover:* This insurance product covers loans, not the value of the animal. When the loan is repaid, the insurance contract stops. The animal must be inspected by a veterinarian and be issued a health certificate. The animal must also be ear tagged. The policy indemnifies the insured livestock owner against (i) the death of the insured animal or (ii) loss of use of the animal (determined by an authorized technician). The compensation levels are:

- 80% of the sum insured in the event of death of the animal.
- 40% of the sum insured in the event of loss of use.

The premium is set at 8% of the value at risk (3% paid by the farmer and 5% paid by the Government). The high cost of administration of the scheme (the need for expert assessments at each step) generates a negative balance for this program.

DCGC does not offer crop insurance, considering it too risky because of input supply issues and weather variability.

DCGC's main activity is to offer coverage for the financial sector (MFIs). MFIs often offer non-collateralized loans to farmers but rely on group mutual insurance to reduce risk. When a farmer is unable to repay his loan, other group members repay the farmer's loan to the MFI on behalf of the farmer in order to prevent default. Hence DCGC offers MFIs portfolio insurance for a very low premium set at 1% (0.5% paid by the MFI and 0.5% paid by the government).

*Agricultural Development Bank / Sana Kisan Bikas Bank (Small Farmer Cooperative model)*

This program is managed by farmers' cooperatives. Farmers are organized in groups:

- Small Farmer Groups (SFG): Representatives of Small Farmer members (5-12 members) form a SFG at the grass-roots level. The SFGs decide on collection of savings, loans and community development programs in the village.
- Inter-Group (IG): Two or more SFGs form an IG at the ward level. The IG supervises, coordinates activities of SFGs.
- Main Committee (MC)-a Board of Directors (BoDs) of SFCLs: All IG Chairpersons from each IG form the BoDs at the VDC level. The BoD as a governing body of SFCLs, formulates plans, policies and appoints staff to carry out activities. The BOD is accountable to the General Assembly (GA).



Source: Sana Kisan Bikas Bank website

The Sana Kisan Bank and the Agricultural Development Bank provide credit to small farmers (through the cooperatives) but also manage the *Cattle Security Program*. This insurance program is restricted to farmers who are part of a SFG. An insurance committee is formed inside each VDC. This insurance committee is in charge of claim verification. This program is now also available to vegetable farmers through the Agricultural Development Bank.

Participating farmers must be members of a group and they pool the premiums collected on a group account. In the case of livestock, premiums are set at 10% (5% paid by the farmer, 5% paid by the government); in the case of vegetables, the premium is set at 15% (7.5% paid by the farmer, and 7.5% paid by the government). Indemnities cover 80% of the insured value of the losses. However, because indemnities are paid by the premiums collected inside the group (combined with the government subsidy), if all the farmers inside one group experience a shock altogether (epidemic disease or hail storm), the premiums collected are insufficient to cover an 80% indemnity for every farmer. Instead, they will split their indemnities, reducing the coverage level and the value of this insurance scheme for farmers. Further, when no catastrophe happens, the premiums paid by the farmers are transferred to a saving account so that the group can decide to reinvest it next year in insurance or any other asset.

Hence, the program strongly depends on public funds and might bias farmers' perception of the cost of risk. However, historical data on the livestock component of the program show that indemnity claims are so rare that that the program is still beneficiary even if it does not accumulate farmers' contributions.

*The existence of the livestock insurance program implemented by the Agricultural Development Bank makes it very unlikely that "true" (maybe unsubsidized) insurance product could attract farmers. Other crops often remain excluded from the insurance market.*

#### **4. Credit to small farmers**

Depending on the commodity they produce, their location, and their participation in a cooperative, Nepalese farmers can have different access to credit. As in the case of insurance, the credit sector focuses on livestock farmers, and opened recently to vegetable farmers. However, credit to cereal crop farmers remains very limited; cereal crop farmers can only access to collateralized credit where they put their home and/or land in guaranty for the loan.

##### *Sana Kisan Bikas Bank*

The Kisan Bank offers credit to farmers' cooperatives at a 5% interest. The cooperatives can then offer credit to their members (9% interest for livestock farmers and 10-15% for crop farmers). When a farmer default, the cooperative uses its resources (it cumulates provisions when a farmer start a new loan) to repay the bank so that the default rate for the bank is very close to 0%.

The Kisan bank's portfolio structure is: 40% livestock, 40% Agriculture, 10% Agro-processor, 10% others. The bank does not require collateral for loans inferior to Rs.100,000 but does require collateral for loans between Rs.100,000 and Rs.400,000, the maximum offered by the bank.

The Kisan Bank offers both short and long term loans. In the case of short term loans (6/12/18 months), the farmer repays the loan in 2 to 18 installments with a 3 month grace period; In the case of long term loan, they benefit from a 1 year grace period. 99% of the loans are repaid within three years.

#### *Muktinath Bikas Bank*

The Muktinath Bank operates as a *Modern Banking* bank (20 branches), *Limited Banking* bank (4 branches in rural areas) and as a *MFI* (22 branches). 30% of their clients reach the bank through its MFI branches, and its branches are concentrated in 10 districts in Western Nepal.

They offer non-collateralized loans to small farmers but farmers must at least subscribe a life insurance policy. In the case of livestock farmers, the Muktinath bank uses the ADBNL insurance program based on group responsibility.

The Muktinath Bank charges 20% interest rates for its loan to farmers, which is a standard value in Nepal for a loan from an MFI; interest rates in the informal sector can reach 40%.

*The existence of the livestock insurance program implemented by the Agricultural Development Bank facilitates the access to credit for livestock farmers. Other crops often remain excluded from the credit market .Outside of the public banking sector, interest rates are high.*

## **5. Risk in Agriculture – Development impacts – Technologies available**

So far we devoted our efforts to understand the risks farmers face to the case of crop farmers. Following USAID target crops, we investigated the case of (1) cereal crops (rice and maize) and (2) high value vegetables.

*The maize sector:* Maize is grown in the Terai (winter maize) and in the Hills (summer maize). In the Hills, maize is grown as a staple crop while in the Terai large farmers (15%-20% richest farmer) can produce it as a cash crop sold to the feed industry. According to researchers at CIMMYT, one very promising combination of insurance and technology that could generate important development impacts is the introduction of hybrid seeds that increase yields. Unfortunately, these hybrid seeds initially suffered from cold temperatures that stopped plants' reproductive stage leaving farmers with very low yields.

Despite this setback, CIMMYT experts claim that the adoption of hybrid seeds could increase yield by 0.5 to 1 ton per hectare in the hills even without any change in fertilizer use. CIMMYT's Hill Maize Research Program and CSISA (Cereal System Intensification for South Asia) put a lot of effort into the promotion of these varieties, and appropriate insurance products could perfectly complement their intervention.



The CIMMYT-CSISA team already made some steps to investigate the possibility of insurance for maize farmers in Nepal and would be ready to work with us on a preliminary assessment of the demand for maize insurance this summer.

*The rice sector:* Rice is the most important staple crop in Nepal and is grown mostly in the Terai. Most of the production is rainfed, so that is very vulnerable to the timing and intensity of the monsoon in the region. In order to help farmers cope with the risks related to the monsoon, IRRI developed several hybrid varieties of drought tolerant or submergence tolerant rice. These seeds do not necessarily produce higher yield during normal weather conditions but they outperform local seeds in situation of stress (drought or flood).

Only 15-20% of rice farmers have adopted these new seeds. IRRI is working to help farmers adopt these new varieties. IRRI distributes starter kits to the farmers so that they can plant these new seed on a small plot. If they are convinced, IRRI makes farmers form a group and helps them produce and market their seeds. The cost of these seeds is comparable to the cost of local seeds (5-10% price difference).

Another technology that IRRI tested recently is laser leveling. According to their tests, laser leveling can increase yield by 10-15%, but the technology is costly and farmers would need to take group loans over several years if they wanted to use this technology.

The RIICE consortium (GIZ, Swiss Agency for Development, IRRI, Allianz and SARMAP) developed a model for rice mapping and yield prediction in the region (Philippines, Thailand, India, Vietnam, Indonesia, Cambodia and Bangladesh) and is willing to expand its program to Nepal in the near future (spring 2015). The final objective of RIICE is to develop an index insurance model suited to the South Asia conditions. I4 and RIICE teams are currently discussing the technical details of the RIICE model to determine how it could be used for insurance purposes (historical data, resolution, accuracy, etc.)

### *High Value Vegetables*

Both iDE and the KISAN teams strongly emphasized the role of vegetables in improving the lives of the poor in Nepal. Indeed, vegetables can be produced by farmers in the hills who are often more vulnerable and they can be produced off-season, generating a new flow of cash that does not require labor transfer from other agricultural activities.

The development of this vegetable market is structured around *Rural Collection Centers* which form with at least 100 farmers each. More than 200 collection centers are already in place and serve about 100,000 households.

However, vegetable production requires the purchase of new seeds, and important investments on the farm (such as water tanks, irrigation system, plastic sheets, etc.), but farmers are liquidity constrained.

From formation, groups of farmers are linked to a buyer who will provide seeds, credit and a market for the output. When the group develops, it can turn into a cooperative who buys individual productions and market it for farmers' best interest. However, the question of access to credit remains important for large investments in irrigation systems, etc. iDE is currently working together with the Frankfurt School of Business and Management, the Agricultural Development Bank and the Muktinath Bank to improve vegetable farmers' access to credit.

In order to cope with risk (hail storm, insects, pest, diseases) they also implement the ADBNL insurance scheme where vegetable farmers pay a premium (the government also contributes subsidy to the premium) to the collection center; the collection center can then use this amount to offer loans to its members or use it for insurance purposes. However, since the collection centers don't pool their resources to mutualize risk, each group is highly exposed to shocks that could affect the entire community.

## **6. Data availability and insurance options**

### *Cereal crops*

Nepal collects agricultural statistics for cereal crops only at the district level which appears to be a too broad area for the implementation of an area yield index based on these data. Since there does not seem to be any other data source for systematic yield measurements in Nepal at a low level of aggregation, weather indices and remote sensing technologies are the only options available. CIMMYT's and IRRI's survey together with government surveys should allow us to test and calibrate these indices.

One important challenge when using index insurance is to minimize basis risk, the difference between the loss actually experienced by farmers and what is predicted by the index. If the index predicts that no indemnity is due while farmers did experience significant losses, farmers can lose faith in this mechanism and the insurance program will fail. In order to minimize these issues, it is possible to back up index insurance with crop cutting exercises; when the index does not trigger but farmers believe that they experienced important losses that should be covered by their insurance policy, they can petition for a crop cutting exercise where an expert comes to the field and takes samples of harvest in randomly picked fields. If the crop cutting results show that the index was wrong, farmers are indemnified. This mechanism reduces basis risk to a minimal value (idiosyncratic risk, i.e. the shocks that only affect farmers individually) at a minimum cost (as long as the index performs well at predicting crop failure most of the time).

### *Vegetable crops*

In the case of vegetables, weather indices and remote sensing technologies are not well suited to predicting yield outcomes and create an insurance index. Weather in the hills varies too much from one place to the other to use weather stations, and the small size of vegetable plots, which are also often covered with plastic sheets, makes remote sensing technology inappropriate. One last option might be to use production data recorded at the collection center level to develop an area yield index. However, the remoteness of these collection centers and their short history might be insurmountable obstacles.

However, one simple modification of the vegetable insurance scheme could provide farmers with greater coverage: in order to insure farmers against covariate shocks, premium collected inside each group could be pulled at a higher level of aggregation. In this case, if an entire group experiences a loss, farmers would not have to split indemnities between group members, each farmer could be fully indemnified for his loss (the same modification could apply to ADBNL's livestock scheme, but covariate shocks seem to be less of a concern in this sector).

### **Preliminary conclusions and next steps before the end of Stage One**

According to the experts we met during the first field visit, it appears that the three most promising candidates for index insurance are rice, maize and vegetables. The existing insurance scheme for livestock producers would certainly make demand for commercial insurance very low. I4 is now consulting remote sensing experts to determine what is possible and what is not for cereal crop yield predictions in the area.

Our team is also trying to imagine how index insurance could work for vegetables, given the structure of the contract between farmers and buyers, the remoteness of the collection centers, and the scarcity of the data.

A final report on the identification of the most promising commodities for index insurance will be prepared for the end of July 2014. These commodities will then be carried into stage 2 where I4 will formally test the different index options available for each commodity against historical yield data, and will design a product for the champion commodity.