

**FINAL REPORT**  
**ON**  
**EFFECTIVENESS AND SUITABLE MODALITY OF CROP INSURANCE FOR**  
**BAGMATI PROVINCE, NEPAL**

**SUBMITTED TO**  
  
**AGRICULTURE DEVELOPMENT DIRECTORATE**  
**MINISTRY OF LAND MANAGEMENT AGRICULTURE AND COOPERATIVES**  
**BAGAMATI PROVINCE, HETAUDA**

**SUBMITTED BY:**  
**NEPAL AGRICULTURE ECONOMICS SOCIETY**

**HARIHAR BHAWAN LALITPUR**

**Cell Phone: 9841296595/ 9851151741**

**Email: [nepalagriecosociety@gmail.com](mailto:nepalagriecosociety@gmail.com)**

**[www.naes.org.np](http://www.naes.org.np)**

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## Acknowledgements

Major thrust of this report on “*Effectiveness and suitable modality of crop insurance for Bagmati Province, Nepal*” is collecting database of national and provincial level and analyzing the contemporary crop insurance market as well as service business. This report not only compares implementation status of Insurance Program activities by the non-life insurance in Nepal but also it builds up of suitable modality for making the farmers buying insurance and taking it as most adopted risk transfer tools.

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Sincerely,

Devendra Gauchan, PhD

General Secretary

Yogendra Kumar Karki, PhD

Chairman

## Acronyms

ADB	Agriculture Development Bank
ADD	Agriculture Development Directorate
AKC	Agriculture Knowledge Centre
AWPB	Annual Work Plan and Budget
CALD	Crop and Livestock Directives
COP	Cost of Production
DADO	District Agricultural Development Office
DLSO	District Livestock Development Office
DoA	Department of Agriculture
DoLS	Department of Livestock Services
DR	Dependency Ratio
EAP	Economically Active Population
FGD	Focus Group Discussion
FSS	Food Self-Sufficiency
FY	Fiscal Year
GoN	Government of Nepal
IB	Insurance Board
ICL	Insurance Company Limited
ICT	Information Communication Technologies
KII	Key Informant Interview
KIS	Key Informant Survey
M&E	Monitoring and Evaluation
MoALD	Ministry of Agriculture and Livestock Development
MoF	Ministry of Finance
MoFLD	Ministry of Federal Affairs and Local Development
MoLMAC	Ministry of Land Management, Agriculture and Cooperatives
NAES	Nepal Agriculture Economics Society
PMAMP	Prime Minister Modernization Project
VHKKC	Veterinary Hospital and Livestock Knowledge Centre
WBI	Weather Based Index
WBCIS	Weather based Crop Insurance System

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## Executive summary

The journey of crop insurance has begun since the Insurance Board (IB) implemented Crop and Livestock Directives (CALD) 2069 (B.S) in Nepal. There are 26 types of policies endorsed in crop and livestock sector and policies in crops are mostly prepared and executing in the field. Very recently, the IB is launching CALD 2077 (B.S) by replacing older directives. Following this directive, the Government of Nepal (GoN) has been providing 75% subsidy in premium to be paid by farmers. The IB is involved in formulation of insurance policy of each crop in coordination with Department of Agriculture under the execution of the MOALD. The government and its allied agencies taking insurance as a service-oriented business, which has GDP contribution of 2.82% in FY 2018 and its contribution is steadily going on. In the FY 2070/71, the premium value (fees) collection was Rs 0.76 million, with Rs 0.43 million 427658 government supported premium subsidy. Analyzing data of seven-year from 2070/71 to 2076/77 showed that compound growth rate of sum insured, premium amount, subsidized premium, claim paid and number of crop policies sold were 95%, 95%, 97%, 80%, 22%, respectively. The highest compound growth rate for the same period was 232%, 219%, 228%, 121%, 38% for sum insured, premium, subsidized premium, claim paid and no of policies of Poultry sub-component. In these scenarios, this study had following study issues:

1. What were the crop production risk and uncertainties increasing to the crop growers? Were these risks and uncertainties addressing by the voluntary insurance programme?
2. What were the institutional efforts in managing and implementing crop insurance to the in the context of these risk and uncertainties faced by the micro actors?
3. What was the effectiveness of existing crop insurance programs being implemented in Nepal?
4. Which crops /commodities and locations were most suited in implementing crop insurance program presently for the Bagmati Province?

For the aim of accessing effectiveness of crop insurance and suggesting appropriate modality for Bagmati Province, study has set following specific objectives. The specific objectives of the study were:

1. Documenting present status of crop insurance programs and analyze key constrains and issues and institutional efforts in managing and implementing crop insurance in Nepal;
2. Ranking types of risk and uncertainties in farming, their coverages by insurance programme, mapping moral hazards of stakeholders, and risk-income trade-up into decisions of voluntary to mandatory crop insurance programme;

3. Analyzing effectiveness of existing crop insurance programs in terms of changed indicators, crop by ranking satisfaction level of the insurers in the context of continuity and sustainability matter;
4. Analyzing relationship of insurance continuity with socioeconomic determinants, SWOT analysis and recommend an appropriate crop insurance modality making crop insurance more effectiveness in Bagmati Province.

NAES mobilized the study team to collect the secondary and primary data/information for accomplished this study. The primary data were collected from the three sources: household survey, focus group discussions, key informant survey and case studies collection. For collecting primary survey, study selected five districts: Chitwan, Makawanpur, Dhading, Kavrepalanchowk, and Nuwakot district. The household survey completed with organizing interview schedule of randomly and proportionality selected 64 respondents of five districts with the use of pre-tested structured questionnaires. Among survey respondents, 87.5% were male and 65.6% represented Brahmin, Kshetri and Thakuri ethnicity. Further information collected by organizing four interaction meetings (for FGD) and organized key informant survey with 37 key experts. The collected data were coded, tabulated and analyzed by using excel and Stata and displayed results in the form of table, graphs and flow charts. Study used index of importance, annual growth rate, compound growth rate, logistic regression model as methods of data analysis. Draft results were presented at validation workshop and at ADD meetings and finalization if it done with their inputs of the exports.

Highlights of major findings of the study are presented in the following points:

- Six insurance companies such as Premier ICL (for Dolakha, Ramechhap, Sindhuli), Himalayan General ICL (Lalitpur, Kavrepalanchowk, Sindhupalanchowk), Rasuwa (General ICL), Rastiya Bima (Kathmandu), Sanima General (Bhaktapur), and Shikhar (Nuwakot, Dhading, Makawanpur and Chitwan) were responsible for crop insurance in Bagmati province out of twenty non-life companies. However, top-five companies in terms of insured sum, premium collection, crop policy sold indicators were Shikhar, NLG, IME General, United, and Himalayan General ICL in a respective order. Irrespective of policy guideline any of the insurer could consult companies working in the district and renew insurance, so field reality was different than Crop and Livestock Directives (CALD) 2077.
- Crop insurers consulted staffs of the companies than those agents. The Shikhar insurance had policy of recruiting technicians (mostly JTA and Officers level) staffs and mobilize them into policy purchase, evaluation and loss estimation;
- Majority of crop insurers did insurance for commercialized crops such as banana, coffee, strawberry, papaya, wheat seed, kiwi, dragon fruit, and cardamom. Banana crop insurance was highest (45%) followed by fresh vegetables (25%). Insured area was 156 ha, with the average of 1.7 ha. Almost farmers have 8 years farming experience and their average reaching time to those

head-quarter based office was 0.9 hour. Almost of those insurers were joined in the local organizations such as farming cooperatives and groups.

- Mostly crop insurers did general risks coverage-types mentioned in the policy contract especially in fire damage, inundation, insect and disease pest, climatic factors. In line with, farmers ranked 14 were important risks and uncertainty factors based on index of the importance. Among these, covid-19 loss as the highest (0.85), cumulative damage of wind, hail and thunder as second (0.84), and disease as third (0.77). Indemnity loss payments in last six year paid for thunder/wind as first (46 cases) and diseases loss (10 cases). Among the insurers, 36% believed that crop insurance would solve the risk/uncertainty coverage. However, not covering damage of wild life (92%), postharvest loss (84) and theft (46%) were top-three worries of the crop insurers. 41% crop insurers only satisfied due to cover and uncover prospective.
- Study assessed moral hazard behavior of crop insurers, agents and companies, which were major operational stakeholders. Study reported a few cases in conflict of interest (CoI) and trade-off management due to mismatch of terms of conditions of contract not followed. Along side of crop insurers, about 30% did expenditure of 75-100%, as mentioned in the contracted policy. Moral hazard specified and unclear in multi-harvest vegetables and mushroom cases. These were nothing issues as much as highlighted by the company staffs. Crop insurers submitted delayed report because of low response of agents or technical staffs in few districts. This was because of low commission to the field technician. Loss report submission and getting indemnity took three to twelve months and 47% farmers reported receiving the reimbursement with the hassle. Claiming full and getting part of its loss (partial to moderate), was done by few companies. Study did not find transparency in loss estimation and payment modality of the indemnity, which was almost applied for all insurance companies. Orientation of high-premium earning enterprises and less attention to crop insurance was example of market-based instrument of the insurance companies.
- Regarding the insurance effectiveness analysis study measured indicators such as growth rate of insured sum, premium charges, subsidy, # of policies increased over the period, any inequalities in loss estimation and indemnity payments, affordability of premium charges, satisfaction of the crop insurers in overall rating, changes before and with insurances and SWOT analysis. Provincial progress of selling policy, insured sum in last seven year was steadily growing and there was not question of premium affordability since 94 reported good affordability until and unless 75% subsidy of federal government. About 50% respondents said it had been transferring risk to the company. The larger and largest investors were used to insurance as regular activity. In comparison to non-insurance durations, insurers faced both positive and negative benefits: increased caring cost, farming confidence, coordination, loan utilization and actual yield aspects.

Researcher felt that insurers further need consultations (64%) about the risk adaptation and its coping mechanisms. Making ineffectiveness of insurance contract was reported by the uncovered risk and uncertainties dominants in study localities such as damages caused by wild animals and stray animals (92%), post-harvest loss (84%), and theft (46%). Majority of the area had monkey, wild boar and stray animal losses, which caused losses at night. Thus, further success of crop insurance would be improved in case these factors to be incorporated in the policy. About one-third insurers enforced by the bank provisions provincial programme. Data shows that two-third (72%) respondents confirmed continuation of crop programme. Factors of continuation of buying contract was due to state subsidy and adhering risks always in the field. The causes of non-adoption were unsatisfied with the insurance services, low duration of contract and even not covering any marketing loss. In fact, consumers were demanding product-based contract by preferences, but local insurance companies sold input based. A bit support had been taking place by Local governments in the proportion of premium changes of the crop insurers in Bagmati Provinces. In fact, crop insurance schemes brought by the government is thought as supply driven, irrespective of high need but it has not been attracting even commercial growers.

- Logistic regression results showed that food self-sufficiency, crop loss duration, access time to reach insurance office, number of employed family in a house, type of farming enterprises, experience in farming, level of awareness on risk transfer and age of the household head among the 15 variables selected were significant. Output of these variables were important to consider while designing crop insurance products.
- SWOT analysis results showed that weakness and threat points to be taken as major intervention areas for improvement of inefficiencies in crop insurance.

Study proposed the working modality of crop insurance for the crop insurers of Bagmati province. Modality is area based as well as insured sum-based incentives especially low holding farmers can encourage via group approach. A one-door-fund is suggested to established under Chief Minister and named it as **Chief Minister-Crop Insurance Incentives**. Establishing “**Crop Risk Assessment and Rapid Surveillance Think Tank Unit**” is under Agriculture Development Directorate (ADD) is strongly suggested. That unit would be responsible in policy formulation, updating, risk analysis, scientific loss assessment management and publication in close coordination with MoLMAC, Insurance Board and MOALD. Also, Insurance would be the past of Agriculture Extension programme throughout the province. The NRB, Insurance Board, DOA, MoLMAC will act as macro actors in policy provision and execution. This model is not new but slightly modified public-community- private partnership model and will be well institutionalize and sustainable. Along with the modality, study has done policy recommendations and some suggestions:

- The role of MOALD is still crucial to execute provincial ministers, coordinate with donor agencies, Parliamentary Committee of Natural Resource, and line-ministries especially the Ministry of Finance (MoF). This study suggests building a policy guideline by preparing crop insurance as mandatory to all regular farm development and food production programme, donor funded Programme as well as Prime Minister Modernization Projects (PMAMP). As far as possible group-based insurance approach would be less costly and have low transaction cost, will be suggested to launch. It will encourage existing crop insurance companies to be mobilized in farm-based service delivery. The ministry also suggested to bring a policy that all card holder would involve in crop insurance work. Preparing diverse insurance products not only for large land-based but also value based insurance programme. Study suggests to study landholding-based and sum ensure package as suggested in the working modality. Same ministry is strongly suggested to direct Bima Samiti for updating CALD.
- The MoALC Bagmati Province also suggested in building guideline of incorporating crop insurance policy for all grant-based food production programme. Provisions are suggested to build up so that existing AKC and VHLSC would run crop/livestock insurance as part of the extension programme. Poor participation due to unaware farms should be the intervention point and major thrust of MoLMAC. Replicate weather-based insurance in crops is also suggested in Bagmati Province districts.
- The MOLMAC is suggested to direct ADD and AKC to start faster technology (smart phone and remote sensing) in Bagmati province to capture and upload the data of crop cutting to reduce the delays in claim payments to the farmers. Smart phones will be used to capture and upload data of crop cutting to reduce the delays in claim payment to farmers. Remote sensing will be used to reduce the number of crop-cutting experiments.
- The Agriculture Development Directorate (ADD) was suggested to act as coordination hub for provincial agriculture programme in terms of establishing **Crop risk assessment and rapid surveillance think tank unit**. This system will support keeping database in the ADD, execute ministerial level subsidies and monitoring of the insurance companies works, prepare guideline for ensuring at least entrepreneurial support program attach into crop insurance. The Office is suggested in strengthening farmers in technical specification as part of insurance requirement at least for variety selection, authentic seed/sapling sources, virus free testing, line planting and other intercultural operations. Organise orientation training and follow-up in crop insurance.

- Insurance Board is strongly suggested to amend CALD 2077 by bringing additional policies such as indigenous crop farming, floriculture and Nursery Management along with keeping space of exploring of demand based diversified insurance scheme, prioritize value-based insurance system, harmonize microinsurance and crop insurance, update record keeping as per district, and monitor the insurance companies and mandatory to employ at least Agriculture Officer level in a district office. Not least but not last, respective insurance companies are strongly suggested faster service in loss estimation, periodic crop monitoring, facilitate loss claim faster, provision of farm-get oriented services and transparent indemnity payment system.



## 1. Introduction

### 1.1 Background information

Bagmati Province is constituted by 13 districts and the province is endowed with four agroclimatic features. Dhading, Rasuwa, Ramechhap, Sindhupalchowk, and Dolakha are mountain districts, Nuwakot and Kavrepalanchowk are Hill districts, Kathmandu, Bhaktapur, Lalitpur are categories as valley districts and Chitwan, Makwanpur and Sindhuli districts lie in Inner Tarai districts. With 3 metropolitans, 1 sub-metropolitans, 41 municipalities and 74 rural municipalities, there are 119 local bodies in Bagmati provinces<sup>1</sup>. Private firms, companies, cooperatives, farmers groups, clubs, and individual farmers are involved in farming of commercial, semi-commercial and substance farming in the province (Bagmati Province, 2020). Majority of the districts are commercial hub for on/off season fresh vegetable production (Dhading, Chitwan, Kavrepalanchowk, Makawanpur, Bhaktapur, Kathmandu), Fruits (Chitwan, Nuwakot, Sindhuli, Dolakha, Rasuwa, Lalitpur), coffee (Lalitpur, Sindhuli, Kavre, Sindhupalchowk), fish (Nuwakot, Chitwan), Potato (Sindhupalchowk, Dolakha and Rasuwa) and so on. Bagmati Province envisions for assurance of food and nutritional security and alleviate poverty through increased agricultural production and productivity through various development programme. However, vulnerability of various farming risk and uncertainties, farmers have not been able to realize expected output from farming business making them prone to low and even sometimes no production at all.

Insurance Board, called it as Beema Samiti in Nepali, is an autonomous body for Insurance Regulatory Authority of Nepal which is under Ministry of Finance, Government of Nepal. The office has assigned twenty Private Non-life Insurance Companies, to implement insurance of crop and livestock as per Crop and Livestock Insurance Directives 2013<sup>1</sup>. Very recently that directive has been upgraded in 2020 as Crop and Livestock Directives 2077. That insurance Board is implementing crop and livestock product policies and making the insurance service contract since the Crop and Livestock Directives approved by Insurance Board on 1<sup>st</sup> Magh 2069 (Bima Samitee, 2076a). Further directive- “Microfinance Directives 2014” as compulsory mandate of Government of Nepal, has been executing by the Beema Samiti so that each company have to invest at least 5% of their portfolio to low- income household (Beema Samiti, 2076), 2076). In addition to the Government’s subsidies (of up to 75%) on agriculture and the special issued set of microinsurance directives, the Government of Nepal has mandated that insurance companies have at least 5% of their total portfolio in microinsurance. These initiatives have increased the focus on the sector.

Insurance Board, Government of Nepal, has been implementing Agriculture Insurance Programme since 2013 (Bima Samitee, 2019& Timilsina et al 2018). Policies like banana, cardamom, coffee, fruit, ginger,

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<sup>1</sup> Information taken from <http://ocmcm.bagamati.gov.np/basic-page/376>

grass, honeybee, sweet orange, lemon, mushroom, orange, paddy, paddy group insurance, seed, sugarcane, tea, turmeric, vegetable (cost and production) and weather index-based policy for apple are now operation in crop related insurance. There are 26 types of policies endorsed in crop and livestock sector (Bima Samitee). Following this directive, The GoN has been providing 75% subsidy in premium to be paid by farmers. Insurance Board of Nepal is involved in formulation of insurance policy of each crop in coordination with Department of Agriculture under the execution of Ministry of Agriculture and Livestock Development (MoALD). Crop insurance journey has begun based on cost of production policy but now reached different policies since 2018. The Insurance Board has brought individual crop insurance policy made for more than 70 products including vegetables, cereals, fruits, fish, honey, and livestock as per the demand of the farmers. By policy there are mainly four types of insurance product in operations: value base, cost of production base, weather index base, and market valuation based (Bima Samiti, 2018; 2020 Abebe and Bogale, 2014).

The government and its allied agencies taking insurance as the business, a service-oriented business, has GDP contribution of 2.82% in FY 2018 and contribution is steadily going on (Bhattra, 2019). Insurance Board has been preparing policy major crop items. Annual average growth rate of crop insurance is analyzed in table 1. Journey of crop insurance began in 2070/71 by insured sum of Rs 15 million from selling crop policies of spring rice, vegetables, banana and banana. The premium value (fees) collection was Rs 0.76 million, with Rs 427658 government supported premium subsidy. In the subsequent years to date, growth rate of sum insured, premium value, subsidized premium from the government, claim paid and no of policies purchased increased sharply except declined the growth rate in FY 2074/75 for sum insured and claim paid by 23% and 5.4%, respectively. Likewise, claim paid declined by 27% for FY 2076/77.

**Table 1: Annual growth rate of crop insurance**

FY	Sum insured	Premium	Subsidized premium	Claim paid	Policy
FY 2070/71	-	-	-	-	-
FY 2071/72	865.36	865.36	1355.73	NA	NA
FY 2072/73	198.54	194.43	160.63	145.81	NA
FY 2073/74	76.94	78.37	78.37	159.4	NA
FY 2074/75	-22.54	-22.54	-22.54	-5.40	NA
FY 2075/76	117.17	117.17	117.17	237.23	80.72
FY 2076/77	41.75	27.75	1720.45	-27.37	9.01

Source: Insurance Board, 2021

In fiscal year 2076/77, there were 3812 policies sold for sum insured amount of Rs 1.6 billion, 82.9 million premium amounts with Rs 88 million as subsidy amount. In the same year, the claimed amount was about 71% (58.54 million) of the premium collected. Study also recorded that 204 insurers from

Bagmati Provinces, among these, largest (62) are reported from Makwanpur, followed by from Chitwan. No insurers reported for Rasuwa, Dhading, Ramechhap<sup>2</sup>, followed by Among the policy holders Bagmati provinces had 204 insurers mostly. Likewise, in the first trimester of FY 2077/78, sum insured, premium amount, subsidized premium and policies were: 413.7 million, 21 million, 15.9 million subsidized premium and 551, respectively. The claim paid amount was about 1.03% (Rs 220000) of the premium amount. It showed that almost all insurances companies were paying lesser number of claims in comparison to the collected premium of that year.

In Livestock insurance, growth rate is the highest in FY 2071/72 by more than 300% for sum insured value, premium collection and subsidized premium. Then subsequent years whole indicators are positive and above 20%. However, claim paid for FY 2076/77 declined by 18.4%. The sum insured amount in the first year was Rs 592 million from the policy sell. Large animals such as dairy cow, milch buffalo, and goat. Number of policies purchased, insured sum, premium, subsidized premium, claim paid for fiscal year 2076/77 is reported 121854 number, Rs 16.86 billion, 846 million, 634 million and 354 million, respectively. The progress of the first semester FY 2077/78 was 6.9 billion insured sums. Both number of claims paid and number of policies are significantly higher than crop policies.

**Table 2: Livestock insurance growth rate**

FY	Sum insured	Premium	Subsidized premium	Claim paid	Policy
FY 2070/71					
FY 2071/72	318.30	318.30	528.3		
FY 2072/73	91.51	89.70	71.20	892.92	
FY 2073/74	48.74	50.01	50.01	47.76	
FY 2074/75	28.64	28.38	28.38	23.27	
FY 2075/76	54.27	54.56	54.56	62.96	75.56
FY 2076/77	20.41	20.91	20.91	-18.36	10.83

Source: Own analysis from data of Insurance Board, 2021

Regarding to total agriculture insurance status, Insurance Board reports growth rates were higher in FY 2071/72 and 2072/73 for the values of sum insured, premium collection and subsidized premium. Then after, growth rate in subsequent four years increased by at least 10% (lowest for policy number). However, premium collection in FY 2075/76 was surprisingly dipped by 75% and claim paid for FY 2076/77 declined by 19%. The sum insured value for fiscal year 2070/71 is Rs 6.25 billion, with premium amount Rs 31.3 million and subsidized premium equals to 17 million. In last fiscal year (2076/77), # of

<sup>2</sup> It is taken from personal note of Mr Sundar Shyam Ghimire, Crop Insurance trainers Department of Agriculture (DoA) as well as PhD Scholar, IAASTU.

policies, insured sum, insurance premium, subsidized premium, claimed amount, no of policies were: 129001 number, 26.38 billion, 1.2 billion, 1.7 billion, 459 million. Among the insured sub-components, it shows share of livestock is more than 60%. Interestingly, crop insurance and birds (poultry) are within the range of 10- 35% and 11-40% for poultry in comparison to the livestock insurance.

**Table 3: Agriculture insurance growth rate trend 2070/71 to 2076/77**

FY	Sum insured	Premium Collected	Subsidized premium	Claim paid	Policy
FY 2070/71	0.00	0.00	0.0	0.0	0.0
FY 2071/72	409.56	409.56	608.24	0.0	0.0
FY 2072/73	89.48	74.94	73.39	459.29	0.0
FY 2073/74	53.10	52.80	52.80	63.04	0.0
FY 2074/75	43.02	34.85	34.85	21.56	0.0
FY 2075/76	67.10	-74.93	74.93	79.51	77.30
FY 2076/77	19.40	17.61	126.97	-19.10	10.39

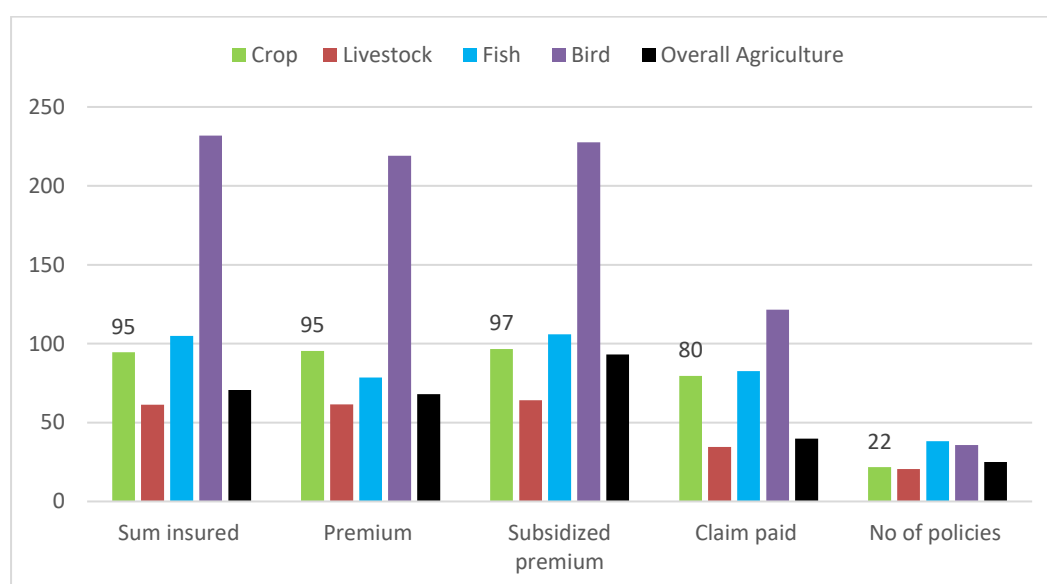
Source: Own analysis from data of Insurance Board, 2021

Shrestha (2021) mentioned upgrading market of agriculture insurance. She mentioned that altogether 65006 policies (1259 policies for crops and 63747 policies of live animals) sold in FY 2076-77. Total premium collection reported 41.3 million from crop insurance and 568.29 million from livestock. Out of it, insurance office paid 16.86 million of 253 crop insurers claims whereas 176.02 million paid for 4103 livestock insurer claims. In comparison to premium collection, claim paid amount was 40.78% in crops, 30.97% for livestock. Total savings of insurance companies in overall agriculture insurance is lucrative. A factsheet prepared for Insurance Board shows that total sum insured has been increased from 625 million NPR in 2014 to 22 095 million NPR in 2019, with livestock insurance policies comprising 95% and crop insurance policies 5% of the entire sum insured<sup>3</sup>

<sup>3</sup> [https://mefin.org/docs/Nepal%20Agricultural%20Insurance\\_Country%20Experience%20Factsheet.pdf](https://mefin.org/docs/Nepal%20Agricultural%20Insurance_Country%20Experience%20Factsheet.pdf)

## Compound growth rate trend of agriculture Insurance in Nepal

Crop and Livestock Insurance Directive 2069 has been implementing for insuring products of farmers. Analyzing data of seven years from 2070/71 to 2076/77 showed that annual compound growth rate of crop, livestock, fish and bird. Growth of sum insured, premium amount, subsidized premium, claim paid and number of policies for crop insurance crop growth were 95%, 95%, 97%, 80%, 22%, respectively. However, compound growth rate for poultry (Broiler, Layers, Ostrich) was 232%, 219%, 228%, 121%, 38% for sum insured, premium, subsidized premium, claim paid and no of policies. Except livestock, almost all enterprise had higher growth than crop.



Source: Own analysis from data of Insurance Board, 2021

**Figure 1: Compound growth rate of agriculture Insurance in Nepal**

Even for a same sub-sector Insurance Board has been arranging two policies: For tea for example, cost of production- based insurance policy before plucking and value based after plucking. The Insurance Board has opened policy room of brining cost of production based to value based, market valuation and weather index based in the later part of the policy implementation. For example: 49 insurance policies made for vegetable types based on both cost of production and production value based, following the farmers preferences. Making the insurance policy effective, Department of Agriculture, Department of Livestock Services and Insurance Board are closely working for six-year specially to organize training to the crop insurance agents and DADO/DLSO staffs, appointing district insurance focal person etc. The agent gets 15% of the premium rate as commission charge for each product and there is 15% discount in overall premium value in case member organization (such as group, cooperative, NGO, School etc.) However, Crop and Livestock Insurance Directives 2077 fixed that commission rate fixed to 10% for both the agent of insurance company and technician (Bima Samiti 2020). Premium rate is fixed five

percent to cost of production based and seven percent to output (value)-based insurance for most of crops and livestock except apple (8%), fish pond (1%), ostrich (2%) and broilers (1.25%). The government has set maximum limit of subsidy limit of 10 million for an insurer. The insurer can get upto 90% of the premium paid in case of total loss and it is partly compensated in case of partial damage.

## 1.2 Statement of problems

The crop growers are facing various farming risks and uncertainties such as low production to no production due to climatic uncertainties (due to drought, flood, wind damage, snowfall and hailstone damage, landslide), weed, disease and insect pest damage, postharvest damage, market based uncertainties (due to price fall, no/low sell), fire, wild animal damage (due to birds, porcupine, wild boar, and other wild animals), supply shock (due to lock-down effect of COVID-19, trade shock because of Indian barrier). Since agriculture insurance transfers common forms of risk from the crop producers to the insurance companies, the GoN is allotting large sum of money every year to pay crop insurance premium subsidy, and insurance companies are assigned in each district. Whatever the provision made; results have shown insignificant growth of farmers joining into crop insurance programme. One the one hand, risk and uncertainties are increasing year after year, government is increasing subsidy grant based on the scenario analysis; farmers, on the other hand, are risk averse to undertake crop insurance. Same scenario is prevailing to the farmers of Bagmati Province. Furthermore, Insurance Board reported higher preferences of same household in livestock insurance especially for productive cattle, buffaloes and goats but reluctant to adopt crop insurance (Timilsina et al, 2018). Both farm income, literacy and age of the farmers are significant factors of probability of adoption of paddy insurance in Chitwan (Timilsina 2018). The mega projects executed by Ministry of Agriculture and Livestock Development (MoALD) is making compulsory crop and livestock insurance policy for those involved farmers organization but as soon as programme phased out, those 100 percent organizations terminated to continue insurance.

In these scenarios, this study has following study issues:

5. What are the crop production risk and uncertainties increasing to the crop growers? Are these risks and uncertainties addressing by the voluntary insurance programme?
6. What are the institutional efforts in managing and implementing crop insurance to the in the context of these risk and uncertainties faced by the micro actors?
7. What is the effectiveness of existing crop insurance programs being implemented in Nepal?
8. Which crops /commodities and locations are most suited in implementing crop insurance program presently in the province?

### 1.3 Objectives of the study

In other to respond above issues, this study aims broadly assessing the status of government insurance program in agriculture and livestock sector and possible suggestions in context of Nepal.

The specific objectives are outlined as:

1. Documenting present status of crop insurance programs and analyze key constrains and issues and institutional efforts in managing and implementing crop insurance in Nepal;
2. Ranking types of risk and uncertainties in farming, their coverages by insurance programme, mapping moral hazards of stakeholders, and risk-income trade-up into decisions of voluntary to mandatory crop insurance programme;
3. Analyzing effectiveness of existing crop insurance programs in terms of changed indicators, crop by ranking satisfaction level of the insurers in the context of continuity and sustainability matter;
4. Analyzing relationship of insurance continuity with socioeconomic determinants, SWOT analysis and recommend an appropriate crop insurance modality making crop insurance more effectiveness in Bagmati Province.

### 1.4 Hypothesis setting

Study assumes cordial and independent relationship among crop insurance contract holders and insured companies. The variables we selected are independent with the decision-making for buying insurance contract and continue it. Intervention of Government of Nepal on running insurance and allocation of subsidy were uniformly distributing as per insurance company, district and insurance policy holding farmer. Analyzing decision-making determinant of farmers while involving crop insurance schemes are also assumed independent to any socioeconomic variables we select for its dependent variables.

### 1.5 Limitations of the study

Study promises collecting samples of 120 respondents, 30 sample each from four district. However, we failed to collect sampling frame 120 samples even consulting five-working districts. Study collected samples from 64 respondents, 17% of the respondents. The study area covered five districts of Bagmati province, which might not represent detail status in comparison to census results. Likewise, Logistic regression model is carried out with total sample size of 90 farmers, which is might measure low power coefficients and may have caused some errors in the results.



## 2. Past studies on crop insurance in Nepal

Ghimire et al (2020) reported historical aspect of crop and livestock insurance in Nepal. Before crop insurance, micro-insurance was offered on a small scale by some cooperatives in Nepal. In 2008 with technical and financial assistance from MOAC, several farmer cooperatives have begun piloting named-peril crop insurance for their members (e.g., windstorm cover for bananas provided by the Agriculture Insurance Multipurpose Cooperative Limited of Kawaswoti and Shiva Mandir VDCs of Nawalparasi; and paddy maize and vegetable insurance in Janodya Multipurpose Cooperative Ltd, Ramnagar, Nawalparasi. Small Farmer Cooperatives Ltd is being implementing crop and livestock microinsurance programs on a scattered firm in small scale. Single one modality does not work- “one-size-fits-all” for the whole province. Any agricultural insurance programs in Nepal are likely to be location specific and will need to reflect the local risk exposures (flood and/or drought are key exposures in the Terai, while hail and landslide are of greater concern in the hills), and take into account infrastructural constraints and the presence of local service organizations.

World Bank Group (2009) did feasibility study and reported some challenges such as poor awareness of farmers on insurance and their accessibility of getting quality insurance service in agriculture, legal and regulatory framework for agricultural insurance, limited financial capabilities of private insurance companies and exposure problem of international insurance practices. Study recommended location specific insurance product (flood and drought in Tarai and landslide and hail in hill), strengthen risk market, need technical assistance, these operational, financial and institutional challenges are still facing but most of these are solving stage. Ghimire (2014) referred that agricultural insurance was implementing in different models in Asia and Pacific region. For example, India and the Philippines followed public sector model, in China and the Republic of Korea adopted public-private partnerships, Australia and New Zealand were practicing purely private markets model and the non-formal private mutual and community-based crop and livestock initiatives were popular in Bangladesh, India and Nepal. Within the region, China holds maximum market (50 percent of total premium), followed by Japan (31 percent) and India (11 percent). Study prioritized institution-based approach over activity-based approach because the earlier had large network and poor activities of individual farmers. Study referred various types of feasible crop insurance products: single peril crop insurance (Hail), named peril (Hail, fire, and frost), multiple Peril, revenue insurance, aggregate yield shortfall insurance, area -yield index insurance, crop weather index insurance, micro-weather index insurance, meso-weather index insurance, macro-weather index insurance. He further elaborated cover and uncover risk factors included in the “Crop and Livestock Directives 2069” including policy provision of 75% subsidy of government.

Swain and Patnaik (2016) studied National Agriculture Insurance Scheme (NAIS) and Weather based Crop Insurance System (WBCIS) in Odisha India. Authors reported increased crop insurance area



coverage from 10 to 16 percent of the gross cropped area in Odisha state between 2000-2012. Increase in insurance coverage was mainly due to increase in the number of loanee farmers but area of crop insurance by non-loanee farmers substantially declined over time in the case of both NAIS and WBCIS. The NAIS was a large coverage insurance scheme whereas WBCIS being a pilot scheme covered only 4 percent of the area insured. The study revealed that WBCIS performed better than NAIS as indicated by the higher adoption rate, the higher percentage of farmers benefited, the lower premium, faster claim payment, and the frequent indemnity payment. However, WBCIS covered only paddy crop losses due to deficit or surplus rainfall. In a frequently disaster-affected state like Odisha, where reasons for crop failure were many, there was also a need for multi-peril crop insurance schemes like NAIS. Therefore, both the schemes continued and complemented each other. The distinct advantage of WBCIS was the speedier processing of claims and payment of indemnity, which was usually within 45 days of receipt of rainfall data. In the case of NAIS users, on the other hand, there was undue delay in compensation payment, which could take up to a year or more, as the collection of yield data via the crop cutting experiment took time. Thus, the performance of NAIS in Odisha was not satisfactory due to low coverage and the delay in compensation payment. Most of the insurance users were either dissatisfied with the scheme or remained neutral expressing no strong opinions on the schemes.

Shrestha (2020) reported more rapid growth of premium amount at Insurance Board from Agriculture insurance over the past six years. Sum insured value was 1004 million in FY 2019/20 which was about 95% increment. However, growth rate fluctuated year to year in a reduced trend. On the other hand, compensation paid in crop subsequently increased almost in the same rate of collection, i.e., 80% in fiscal year 2019/20. Data upto January 2020 showed that premium collected for crop insurance was 41.35 million and total of 65006 number of agriculture insurance policies in the market sold that year. Crop insurance policy implemented from 2012 has been combating impoverishment by protecting crops from the unforeseen risk. Why does handful of farmers benefitted from the crop insurance policy was rarely studied. Lack of awareness of farmers, access of insurance office proximity to the farmer's location, moral hazard, fraud, valuation difficulties, malpractices, inadequate claim information, and claim settlement inefficiencies of the insurance office were major challenges she reported. Insurance Board further updated information for 2019/20 that Policy holders of 129001 collected NRs 2.6 billion insured value for crop, livestock and fishery. Of those, 12438 number claimed the losses sum of NRs 622 million. Majority of the policy holders reported for apple (weather-based index) followed by banana and sugarcane. Same organization reported 551 newer policy holders for 2020/21.

By latest, Insurance Board (2020) brought the latest Crop and Livestock Insurance Directives in effect in 2020 (2077 B.S) that past drawbacks on policies are correcting. New policy amended following points: i) Among all insurance product, any insuring company (Insurer) should sell at least 5% agriculture policy (both crop and livestock), ii) Any insurance company can sell crop and livestock insurance policy in any of the district; iii) making responsibilities in defining premium amount from federal, province and local

government; iv) collect live evidence including photos and video snapped from different angles; v) commission rate for the agent made 10% of the insured amount, vi) flexibilities in evaluating losses claim by the insured company in case insurance value is less than 0.2 million. The same directive also assigned working district for insurance companies based on geography, economy and province.

Insurance Board, called it as Beema Samiti in Nepali, is an autonomous body for Insurance Regulatory Authority of Nepal which is under Ministry of Finance, Government of Nepal. The word 'Beema' means 'Insurance' and 'Samiti' connotes 'Board'. Hence, the Word 'Beema Samiti' is synonymous to Insurance Board which is constituted to systematize, regularize, develop and regulate the insurance business within the country under Insurance Act, 1992. The Board looks after all the insurance related activities in the Federal Democratic Republic of Nepal. As a regulatory body, the Board's main concern is to create a professional, healthy and developed insurance market in Nepal. Overall Agriculture insurance was started in 2013 after bringing Insurance Act and its regulations (Bima Samitee, 2019). With the help of twenty Private Non-life Insurance Companies, "following Crop and Livestock Insurance Directives 2013" That insurance Board is implementing crop and livestock product policies and making the insurance service contract since the Crop and Livestock Directives approved by Insurance Board on 1st Magh 2069 (Bima Samitee, 2076a)

Insurance Board, Government of Nepal, has been implementing Agriculture Insurance Programme since 2013 with the help of Private Non-life Insurance Companies (Timilsina et al 2018). Those insurance companies are following crop and livestock insurance Directives 2013 formulated by the Government of Nepal (GoN). Following this directive, The GoN has been providing 75% subsidy in premium to be paid by farmers. Insurance Board of Nepal is involved in formulation of insurance policy of each crop in coordination with Department of Agriculture under the execution of Ministry of Agriculture and Livestock Development (MoALD). Crop insurance journey has begun based on cost of production policy but now reached different policies since 2018. The Insurance Board has brought individual crop insurance policy made for more than 70 products including vegetables, cereals, fruits, fish, honey, and livestock as per the demand of the farmers. By policy there are mainly four types of insurance product in operations: value base, cost of production base, weather index base, and market valuation based (Bima Samiti, 2018; Abebe and Bogale, 2014). Even for a same sub-sector Insurance Board has been arranging two policies: For tea for example, cost of production- based insurance policy before plucking and value based after plucking. The Insurance Board has opened policy room of bringing cost of production based to value based, market valuation and weather index based in the later part of the policy implementation. For example: 49 insurance policies made for vegetable types based on both cost of production and production value based, following the farmers preferences. Making the insurance policy effective, Department of Agriculture, Department of Livestock Services and Insurance Board are closely working in the last six-year for organizing training to insurance agents, DADO/DLSO staffs, appointing district

insurance focal person, premium subsidy allocations related works. The agent now gets 10% of the premium rate as commission charge for each product and there is 15% discount in overall premium value in case member organization (such as group, cooperative, NGO, School etc). Premium rate is fixed five percent to cost of production based and seven percent to output (value)-based insurance for most of crops and livestock except apple (8%), fish pond (1%), ostrich (2%) and broilers (1.25%). The government has set maximum limit of subsidy limit of 10 million for an insurer. The insurer can get upto 90% of the premium paid in case of total loss and it is partly compensated in case of partial damage. The details of premium rate and insurance types are given in Appendix 7.

Bagmati Province is constituted by 13 districts and the province is endowed with four agroclimatic features. Dhading, Rasuwa, Ramechhap, Sindhupalchowk, and Dolakha are mountain districts, Nuwakot and Kavrepalanchowk are Hill districts, Kathmandu, Bhaktapur, Lalitpur are categories as valley districts and Chitwan, Makwanpur and Sindhuli districts lie in Inner tarai districts. With 3 metropolitans, 1 sub-metropolitans, 41 municipalities and 74 rural municipalities, there are 119 local bodies in Bagmati provinces<sup>4</sup>. Private firms, companies, cooperatives, farmers groups, clubs, and individual farmers are involved in farming of commercial, semi-commercial and substance farming in the province. Majority of the districts are commercial hub for on/off season fresh vegetable production (Dhading, Chitwan, Kavrepalanchowk, Makawanpur, Bhaktapur, Kathmandu), Fruits (Chitwan, Nuwakot, Sindhuli, Dolakha, Rasuwa, Lalitpur), coffee (Lalitpur, Sindhuli, Kavre, Sindhupalchowk), fish (Nuwakot, Chitwan), Potato (Sindhupalchowk, Dolakha and Rasuwa) and so on. Bagmati Province envisions for assurance of food and nutritional security and alleviate poverty through increased agricultural production and productivity through various development programme. However, vulnerability of various farming risk and uncertainties, farmers have not been able to realize expected output from farming business making them prone to low and even sometimes no production at all.

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<sup>4</sup> Information taken from <http://ocmcm.bagamati.gov.np/basic-page/376>

### **3 Methodologies of study**

#### **3.1 Team mobilization**

The NAES, as proposed in the inception report mobilized five staffs. Mr Thaneshwar Bhandari who was involved as team coordinator for overall project implementation. NAES recruited four enumerators and one research assistant for data collection and draft report preparation. Further, NAES has made coordination committee in order to finalize financial and technical proposal as well as report finalization. Team involved in study are listed in Appendix 1a and b.

#### **3.2 Desk study**

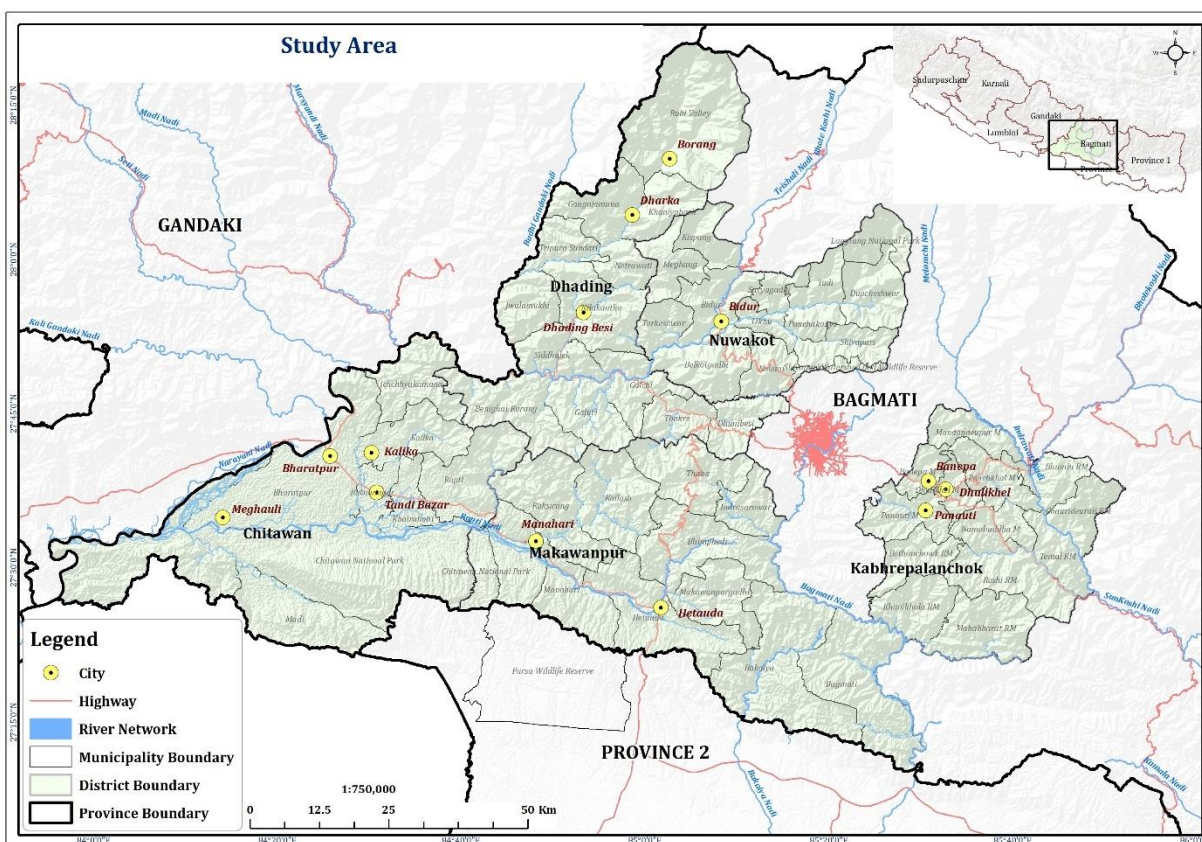
The information like crop production and insurance policies, strategies and programs were collected from the published and unpublished sources either of national or international ones. Study collected secondary data from MoALD, DoA, ADD, MoLMAC Bagmati Providence, respective Agriculture Knowledge Centre located in the districts, Insurance companies, related government and non-government offices and e-resources.

#### **3.3 Types of data collected**

Study team used both secondary and primary data/information for accomplished this study. The primary data were collected from the three sources: focus group discussion in each district, household survey, key informant survey and case studies collection for CoP and payments made over claims. The secondary data were collected from the district published or unpublished data-set under writes policies, dataset of insurance offices, oral expressions including Insurance Board publications.

#### **3.4 Study districts**

Study team selected five districts: Chitwan, Makwanpur, Dhading, Kavrepalanchowk and Nuwakot district. The selected districts are depicted in Figure 1.



**Figure 2: Map of the study districts in Bagmati Province**

District selection based on dominance of crop insurance buyers in the last fiscal year, as records received from Department of Agriculture and Insurance Board.

### 3.5 Population, sampling frame, and sample technique

The team requested the local Extension Officers of AKC to update final status of farming households but faced updated statistics of the study districts. In case of sampling frame, team used the records collected by Sundar Shyam Ghimire, DOA for fiscal year 2076/77. Latest sampling frame prepared after discussing with the district stakeholders, particularly AKC and insurance offices. Ultimately, study selected 64 samples from those farmers who are continued insurance. The list of samples, sampling frame and population is given in Table 4.

**Table 4: Farming population, sampling frame and sample selection**

S.N.	District	Farming *Population	sampling frame (crop insured in 2076/77)	Sampling frame (Crop Insured 2077/78)	Sample selection
1	Chitwan		37	337	40
2	Makwanpur		62	7	3
3	Dhading		65	8	5
4	KavrePalanchowk including Sindhupalchowk	88408	46	12	8
5	Nuwakot		5	13	8
	Total		215	377	64

\* Farming households are counted as rough estimation of 60% of total households counted in CBS 2068 records.

Source: DoA, 2076 and Field survey, 2077

Table 4 shows that about 17% samples, selected from the latest sampling frame. Definitely 62.5% were selected from the Chitwan because of dominancy in taking continuity in crop insurance. Irrespective of our inception report planning of 30 samples from four districts<sup>5</sup>, the survey team unable to get information of insurance policy holders in Makwanpur, Dhading, Kavre and Nuwakot district. Other matter is that survey team is counting one policy as one insurer, however, Insurance Board /Local insurance counted it as number of group members joining in that policy. The team, in Nuwakot collected information from two cooperatives by counting these as two respondents but each policy included 100 shareholders cultivating spring rice. Study team only did household survey with whom was involved at least involved in loss claim of particular crop. Telephone list of each participant collected from local insurance office as well as AKC and visited them in their home for household survey.

By gender and ethnicity among 64 respondents, selected samples represented 87.5% male and 12.5 % female. By ethnicity of the insurers, 65.6% respondents belonged to *Brahmin*, *Kshetri* and *Thakuri*, 26.6% represented *Janajati* and *Adibasi*, and 7.8% from *Madheshi* caste (Table 5).

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<sup>5</sup> In inception report study proposed four districts: Dolakha as mountain district, Dhading as hill, Lalipur as hill but Kathmandu valley district and Chitwan as inner terai district based on priliminary discussion with DoA records. However, sampling districts modified when getting telephone discussion of district insurance offices. Study team included Chitwan as Inner terai, Makwanpur as capital of Bagmati Province, Nuwakot and Kavre as hill districts and Dhading as mountain district; thus included five districts in total. Some respondents, having business in Sindhupalchowk are also included as respondents.

**Table 5: Gender and ethnicity of the respondents**

The proportion of male respondents (87.5%) was higher than female (12.5%). Brahmin and Chhetri (69%) was the dominant ethnicity.

District	Gender		Ethnicity			Grand Total
	Male	Female	Brahmin, Chhetri and Thakuri	Janajati	Madheshi	
Chitwan	56.3	6.3	40.6	14.1	7.8	62.5
Makwanpur	3.1	1.6	3.1	1.6	0.0	4.7
Dhading	6.3	1.6	6.3	1.6	0.0	7.8
Kavre	10.9	1.6	9.4	3.1	0.0	12.5
Nuwakot	10.9	1.6	6.3	6.3	0.0	12.5
Grand Total	87.5	12.5	65.6	26.6	7.8	100.0

Source: Household Survey, 2021

### **3.6 Tools and techniques used in primary data collection**

#### **3.6.1 Pretesting and finalization of structured questionnaire**

Tools used for household survey was preparing structured questionnaire. The draft questionnaire submitted in Inception Report was pre-tested with the three insured farmers in Sunderbazaar Lamjung. Both the coordinator and enumerators sit in discussion, finalize questionnaire and prepared excel sheet. Orientation of questionnaire, template of spreadsheet preparation, pre-testing questionnaire and finalization of questionnaire took place on 5<sup>th</sup> and 6<sup>th</sup> Chaitra 2077. Finalized questionnaire for household survey has been attached in Appendix II.

#### **3.6.2 Organize FGD and key-informant survey**

The field visit was organized in various date for organizing focus group discussion and key informant survey (KIS). Study team organized three FGDs (Chitwan, Nuwakot and Kavrepalanchowk) by organizing 5-10 persons of the same organization and discussed in common issues in crop insurances. About 14 persons joined in three discussions. Certain case studies had been collected particularly in cost of production estimation, under write maintenance, payments of claims etc.

Likewise, study consulted 37 key experts including 20 officials of Insurance Offices and 17 Senior Officers, Managers and Proprietors engaged in crop insurance as well as microinsurance of district offices of Chitwan, Makawanpur, Dhading, Kavrepalanchowk, Nuwakot, Lalitpur, Kathmandu district (Appendix 3a). Study used simple checklist for the officers, agents and Manager (Appendix 3 b & c) in

order to collect descriptive as well as quantitative information. Also, we used online and telephone discussion while gathering information.

### 3.7 Data tabulation and analysis

The collected data were verified, synthesized, tabulated and analyzed according to the scope of work and suitable software such as STATA and excel. Both descriptive and quantitative methods used to analyze required information to review the progress of the project. Then, inference was drawn in the form of pictures, graphs, diagrams and narrative summary. The inferential statements would sufficiently extrapolate the prevailing performance of selected indicators.

#### 3.7.1 Descriptive statistics

Data entry was used to count frequency, percentage, median, and trend analysis. The achievements against the appraisal target were analyzed in a quantitative manner along with suggestions of improvements. Particularly secondary data such as insured sum, premium charges, subsidy collection, claim amount, policy number and other socio-economic data analyzed.

#### 3.7.2 Use of ordinal scale

Perceptions of insurers, views, ranking and effectiveness analysis of the crop insurance were measured in terms of 5 point-Likert scale and satisfaction matrix (six-point rating scale: highly unsatisfactory (1); unsatisfactory (2), moderately unsatisfactory (3), moderately satisfactory (4), satisfactory (5) and highly satisfactory (6)). Qualitative variables such as agree/disagreement etc. are analyzed using these ordinal categories. Likewise, study team ranked major risk and uncertainty factors that are realized by the respondents by calculating the index of importance for each factor. These factors were ranked according to the value of index of importance in ascending order. It was calculated using the following formula:

$$Index\ of\ importance(I)_{i^{th}\ firm} = \sum \frac{f_i S_i}{N} \dots\dots\dots i)$$

were,

$f_i$  is the frequency of  $i^{th}$  index

$S_i$  is the scale value for  $i^{th}$  index

$N$ = sample size

Farmers ranked most important as 1 and least as 5. These frequencies were multiplied by the importance we gave: 0 to 1 based on lowest to higher weightage. Visualization of data took place in radar graphs.



### 3.7.3 Calculating annual average growth rate and compound growth rate

Calculating compound average annual growth rate of insurance products (insured sum, premium, subsidy premium, policy number) was done growing from the beginning condition (2070/71) to the ending year 2076/77. For estimating annual growth rate:

$$\left(\frac{EV}{BV}\right)^{1/n} - 1 \dots\dots\dots \text{ii)}$$

Where, EV = Ending value

BV = Beginning value

N = Number of years

**Annual average growth rate** was estimated by dividing the final value by beginning value subtracting 1 from whole. Then results were multiplied by 100 to receive in percentage form.

$$\left(\frac{\text{Ending value}}{\text{Beginning value}} - 1\right) * 100 \dots\dots\dots \text{iii)}$$

(Ending value /Beginning value) -1. It was calculated in percentage

### 3.7.4 Logistic regression analysis

Comparative analysis of insurance adopters and probability of continuity of insurance has been affected by socio demographic and economic variables such as age, schooling years, ethnicity, gender, occupation, working family size, total household income, total land holding, total operational holding etc. Binary logistic is a non- linear regression model where the probability of an event to occur can be predicted based on the value of the explanatory variable which bears a significant relationship with the dependent variable. In this model the dependent variable is dichotomous i.e., it has two categories (Guajarati and Porter, 2009). The logit is non-linear models and follows maximum likelihood method (ML) coefficient estimations (Gujrati, 2004). The logit model is generally preferred by the researchers because of its comparative simplicity. According to Sirak and Rice (1994), the logit regression model is characterized by flexibility, convenience, and power, and is often preferred where the dependent variable is dichotomous in nature: 1 for those farms who would like to continue crop insurance and 0 for those farms says not continue or other neutral decisions. Various predictor variables in the study are both categorical and continuous ones related to effectiveness analysis in study area. The probability is given by:

$$y_i \text{ (} p_i = 1, 0 \text{)} = \frac{e^{\beta^T x_i}}{1 + e^{\beta^T x_i}} \dots\dots\dots \text{iv)}$$

where,

$P_i$  = probability of continue crop insurance.

$$Z_i = \hat{Y} = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \hat{\beta}_2 X_2 + \dots + \hat{\beta}_n X_n \dots\dots\dots \text{v)}$$

The equation (v) is also called cumulative logistic distribution for n number of regressors. Based on the regressand and the regressors, the binary logistic analysis was specified by using the following equation:

$$\hat{Y} = \hat{\beta}_0 + \hat{\beta}_1 X_1 + \hat{\beta}_2 X_2 + \dots + \hat{\beta}_{15} X_{15}$$

where,

$\hat{Y}$  = Estimator of continue (1) or discontinue decision on crop insurance

$X_1$  = Food self-sufficiency in categorical order (1: < 3 month, 2: 3-6 month... 5: >12 month)

$X_2$  = Crop losses face year, in year;

$X_3$  = Duration of insurance, in year;

$X_4$  = Land size, in ropani;

$X_5$  = Reaching time to insurance office, in hour;

$X_6$  = Employed family at family, # of family members;

$X_7$  = Economically active member, # of family member;

$X_8$  = Types of farming enterprises, 1= subsistence, 2: semi, 3: commercial;

$X_9$  = Membership of the organization, 0 = no, 2= group, 3: coops, 4: crop firm

$X_{10}$  = Experience in farming, # of year;

$X_{11}$  = Financial literacy and education; Literacy; Y/N and education in years of enrollment;

$X_{12}$  = Level of awareness on risk transfer, 1= low, 2= medium, 3= high;

$X_{13}$  = Ethnicity, 1: B/C/Thakuri, 2: Janajati, 3: Dalit, 4: Madeshi ;

$X_{14}$  = Age, year;

$X_{15}$  = Gender, 0: female, and 1 = male.

Here  $\hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2, \hat{\beta}_3, \hat{\beta}_4, \hat{\beta}_5, \dots, \hat{\beta}_{15}$ , are coefficients of explanatory variables.

**Wald test:** Wald test measured the significance of given coefficients of the explanatory variables

$$W = \left[ \frac{b_j}{Sb_j} \right]^2$$

Where,  $b_j$  demotes the coefficient of  $\hat{\beta}_j$  and  $Sb_j$  is the standard error.

**Hypothesis testing for logistic regression:** Null hypothesis:  $H_0: \beta_j = 0$  and  $H_A: \beta_j \neq 0$

#### 3.7.4 Organization of validation workshop

The NAES organized a validation webinar in zoom consisting of 27 participants to share findings of field research, discussion of finding with national sector wide groups, collection of feedback for improvement

of the report before final submission. The draft report and findings of the study refined and validated through expert review and consultation meetings within NAES sub-committee.

### **3.8 Submission of final report**

NAES has submitted final report by including the feedbacks of the stakeholders. All expected outcomes during the submission of proposal have been fulfilled. The final report includes:

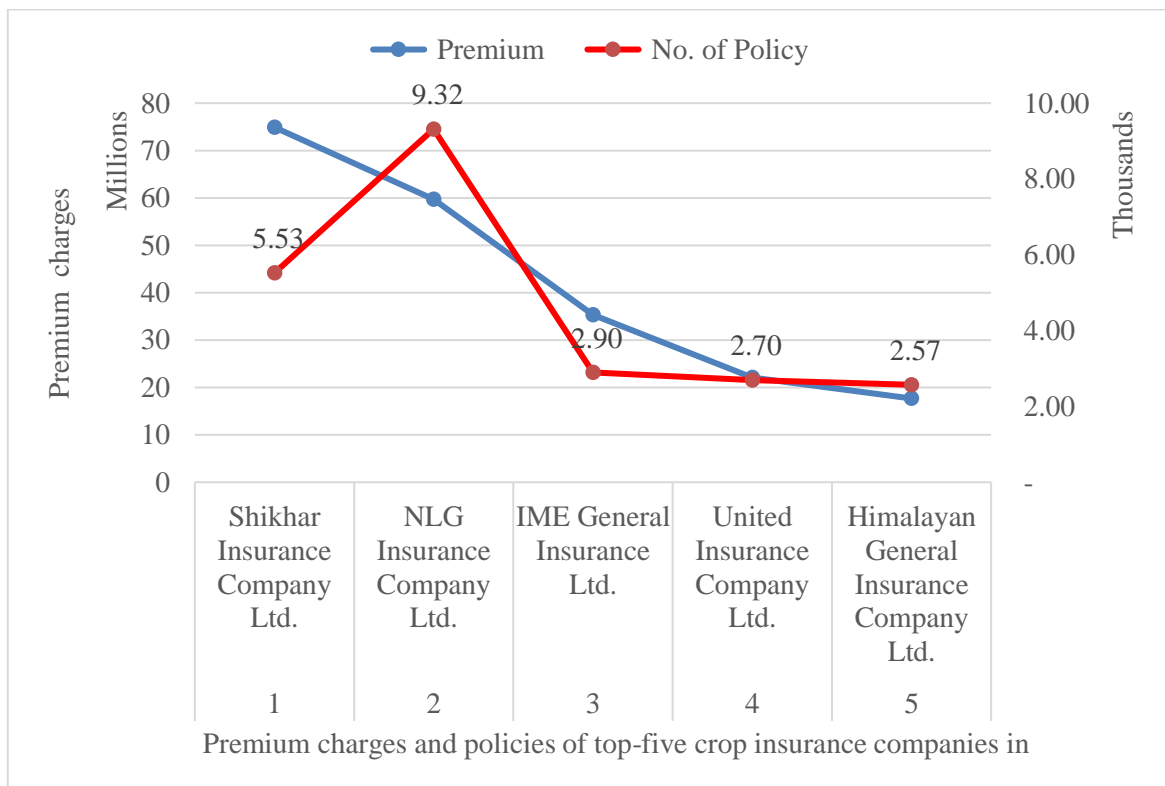
- Analyzed report risk and production uncertainty into decisions of voluntary to mandatory crop insurance programme.
- Documented present status of crop insurance irrespective of policies implemented by the Insurance Board, international practice of crop insurance especially in South Asian to developing country context, analyzed institutional efforts in managing and implementing crop insurance, and finding growth rate of government investment in insurance over outcomes generated.
- Analyzed effectiveness of current crop insurance programs implemented in Nepal including mapping satisfaction level and attractiveness of the farmers in designed crops and commodities.
- Suggested context based effective insurance modality as well as policies as per the satisfaction and problem the stakeholders are facing.

## 4.Result and discussions

### 4.1 Insurance companies and their services

#### 4.1.1 Current status of insurance companies working in Bagmati province

There were twenty non-life insurance companies responsible to sell crop insurance policy throughout the country (Beema Samiti, 2077). Among these, Ajod, Sanima and General Insurance have short tenure and just establishing office. As per latest data in FY 2077/78, 14 companies used to involve crop and livestock insurance in the districts of Bagmati Province (Appendix 4). Although, theoretically Shikhar (Dhading, Nuwakot, Chitwan, Hetauda, Rasuwa), Himalayan General Insurance Company (Kavre), are assigned to provide insurance service. The insured sum for both crop and livestock was 5.56 billion, with the collected premium sum equaled to 266 million. The subsidy amount of the government was almost 20 million, 75% of the premium. Among these companies, Shikhar, NLG, IME General, United insurance and Himalayan General were resembling topmost order in terms of sum insured, premium value and sum of premium. Per policy average insured sum, average premium and subsidy was Rs 412441.5, 19222 and Rs 4807, respectively.



Source: Insurance Board, 2021

**Figure 3: Premium and policy status of top-five insurance companies**

Figure 3 shows status of five insurances. Among the purchased policies, the NLG had highest number (9315) followed by Shikhar insurance (5525). Showing insured sum, premium value, subsidy value, we found higher for Shikhar Insurance, representing share in total as 21.6%, 22.43%, 22.44%, respectively.

Crop and Livestock Directives 2077 has been assigned to work 3-4 districts for each company. However, these companies were reported working throughout the county, with varied non-life services. Central office of Shikhar insurance reported of doing crop and livestock insurance in 76 districts in Nepal. This was counted as the leading company in crop insurance sector where 40000 plus policies purchased to date, with almost of the crops, The office also ranked itself as the first in livestock and poultry insurance and pioneer in terms of using staffs, in placement of agents mobilized. Likewise, Himalayan Insurance Company was counted as top-fifth rank in coverage of service provisions. The rest of the companies such as Premier, General, Sanima General were ranked as 7<sup>th</sup>, 9<sup>th</sup> and 13<sup>th</sup> position.

**Table 6: District wise assigned companies and their performance rank**

S.N.	District	District category	Assigned Company	rank
1	Dolakha	Mountain	Premier Insurance Company (Nepal) Ltd.	7
2	Sindhupalchowk	Mountain	Himalayan General Insurance Company Ltd.	5
3	Rasuwa	Mountain	General Insurance Company Ltd.	9
4	Ramechhap	Hill	Premier Insurance Company (Nepal) Ltd.	7
5	Sindhuli	Hill	Premier Insurance Company (Nepal) Ltd.	7
6	Kavrepalanchowk	Hill	Himalayan General Insurance Company Ltd.	5
7	Kathmandu	Hill	Rastriya Beema Company Ltd.	0
8	Bhaktapur	Hill	Sanima General Insurance Company Ltd.	13
9	Lalitpur	Hill	Himalayan General Insurance Company Ltd.	5
10	Nuwakot	Hill	Shikhar Insurance Company Ltd.	2
11	Dhading	Hill	Shikhar Insurance Company Ltd.	2
12	Makwanpur	Hill	Shikhar Insurance Company Ltd.	2
13	Chitwan	Terai	Shikhar Insurance Company Ltd.	2

Source: Insurance Board, 2021

#### **4.1.2 General status of crop insurance in study districts**

Counting it as inner Terai district, **Chitwan** was the commercial production hub of varieties of crops among the districts of Bagmati province. The assigned insurance company, as per “Crop and Livestock Insurance Directives 2077” is Shikhar ICL and its office is located in Airport, Bharatpur and has been establishing since 2071. Their dataset shows about 337 + farmers doing insurance in Chitwan<sup>6</sup> in FY 2077/88 and that number is reduced by nearly 100 in comparison to last year. Alone Shikhar Insurance

<sup>6</sup> FGD conducted at Shikhar Insurance office, Chitwan revealed that there are 337 active crop insurers. Among them, 328 of banana insurers, 1 mushroom, 4 wheat seed, 4 vegetables. Among these, 100 banana insurers are from NECO Insurance.

record showed insured sum of NRs 441 million for 800 ha land, 21.7 million was premium collected. In total, 612 million amount is insured sum for banana only. Prudential, Nepal insurance were other leading crop insuring companies. Madi municipality has complementing 100% amount of insurer payments in any crops or livestock while Bharatpur municipality has been arranging 50% of the it. Survey has been taking place in Kalika, Bharatpur, Pithuwa and Ratnanagar Municipality. Farmers involved in crop insurance were facing windstorm damage in banana, so almost claims took place at a same time.

**Kavrepalanchowk and Sindhupalchowk districts** are counted as commercial production hub of vegetable, potato, milk, cardamom, mushroom and cereals. Study team collected information of insurance office and insurers in Banepa, Dhulikhel, Kuntabeshi, Chautara and Melamchi city. There were almost all insurance companies competitively working in livestock insurance and but two companies mainly Himalayan General ICL and NECO ICL did for crop insurances, even though assigned insurance company, as per “Crop and Livestock Insurance Directives 2077” was Himalayan General ICL. Discussion made by agents and AKC staffs revealed that Pioneering crop insurance in 2071-72 by spring paddy growers of Kuntabeshi. The ASC, Kuntabeshi joined 15 farmers in a group and DADO (former name) released Rs 5,00,000 in that fiscal year. Farmers were trained on spring rice farming, oriented on crop insurance, made contract with local insurance office as per “Chaite Dhan Paddy Group Insurance Policy” under cost of production approach. In fiscal year 2072-73, 7 farmers, of Panchakhal did group-based potato insurance as per directive of “Crop Protection Insurance” implemented by the Agriculture Development Bank (ADB), head office (ADB, 2075) under microinsurance policy<sup>7</sup>. AKC Kavre is leading both Kavre and Sindhupalchowk district in a recent transformation of extension approach of DADO. The office has been implementing “a model farm in a province by providing 1.4 million per firm since 2076 B.S”. These eight firms, brought into crop insurance programs, were continued crop insurance. Local insurance office and AKC gave 12 names as regular crop insurers who were adopting input cost-based insurance of mushroom, cucumber, potato, tomato and cardamom sub-sector.

Most of the insurers and insurance office were concentrated in Battar (Bidur Municipality), Kakani-2, Belkotgadhi-12, Myanglong -03 of Nuwakot district. Like in Kavre, almost non-life insurance companies had offices in Battar (Bidur Municipality) and competitively working in non-insurance. The assigned insurance company, as per “Crop and Livestock Insurance Directives 2077” was Shikhar ICL and its office is located in Battar city and has been working since Chaitra 2071. Crop insurance was started from 500, 900, 1900, 2500, 2980 and 3800 ropani khet land from FY 2071/72 to 2076-77, , respectively either in single or in group insurance approach (Spring rice) in close coordination with the

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<sup>7</sup> The policy of ADB, directly funded from Ministry of Finance to ADB has been implementing in Bagmati Province particularly in deprived members. The premium collected from the farmers (25%) and subsidized premium (75%) has been mobilized by the group or cooperatives, as per policy they prepare.

DADO office. ADB branch office, Bidur is also provide loan, by doing crop insurance. After transforming DADO into AKC, staffs facilitate farmers in crop insurance basically in high-tech farming: mushroom, tomato, cardamom nursery, coffee, avocado, ginger, strawberry, which are almost supported by any programme or taken loan from bank. They did production-based insurance for ginger crop. The AKC FGD, led by Mr Keshab Khanal stressed on crop guideline as well as all PMAPM programme should be have directives of crop insurance mandatory. The technicians suggested to improve policy problems: farmers are not accepting partial /full loss figure when use loss estimation directives taught by the DOA, which they are saying faulty, unacceptable to the claims issued by the policy holding farmers. Short-duration insurance (just 60 days in Mushroom, 2-3 months for a vegetable is not efficient time to claim losses before marketing. Bidur Municipality has been complementing 50% of the premium as subsidy for doing insurance in crop and livestock.

In **Dhading**, Shikhar was the both assigned and leading company in crop insurance purview among the other non-life companies such as NECO ICL, IME General ICL doing crop insurance. ADB, on the other hand, supporting microinsurance of crop and livestock of limited groups and cooperatives. From FY 2073-74 to 76/77 period, companies reported 65, 78, 91, and 11 policies sold. Downsizing of policy purchase affected by COVID-19 lockdown in the recent two-fiscal years. Also, counted it as hub of vegetable production for Bagmati and Gandaki province, farmers in Dhading were not attracting in vegetable insurance as much as they had selling vegetables. The commercial farmers, who were investing in high-tech farming (kiwi/papaya, sweet pepper, cucumber, tomato) under plastic tunnel under loan or subsidy programme, were purchasing insurance. As in Kavre, AKC Dhading has been implementing “a model farm in a provincial constitution area by providing grant of 1 million per firm since 2076 B.S”. Those four firm’s business plans were bringing into crop insurance programme and policy contract made with NECO ICL. The lately established IME General ICL had contract with the Nilkantha Municipality and Tripura Sundari rural municipality doing contracts in livestock and crop in that year. Both office: farmers sharing was planned 60:40 in the premium price of farmers. It seems that subsidized premium contribution including local government was 4.5% and just nominal for the farmer (0.5%) in the allocated 5% premium charges. All insurance offices are promoting cost-based approach for tomato, banana, mushroom, cucumber, sponge gourd, bitter gourd policies. However, number of policies purchase was in infant stage and farmers were in process of buying policy.

In **Makwanpur** district, same situation also reported as explained in other districts. Study team visited non-life insurance office located at Hetauda office, Manahari-3, Handikhola, Thahanagarpalika were and crop insurers. Since Hetauda is the capital city of Bagmati Provinces, the team found the presences of almost insurance companies. As per “Crop and Livestock Insurance Directives 2077” Shikhar ICL, office located in Hetauda bazaar, is the responsible office for crop insurance. However, Punditcal ICL, United UCL, NLG and ADB are also providing services. The Bima Samiti provided about statistics of 65 insurers in FY 2075/76, however, study team got 9 farmers in different locations who are buying

policy of dragon fruit, kiwi, banana, and mushroom. Almost available companies had focus in livestock insurance and least priority to hectare- based crops. Making contract with CoP and loss estimation are different as per organization. Making crop insurance has been found as obligatory requirement, rather than voluntary and continue process.

#### 4.1.3 Status of insurance companies providing services to the respondents

Table 6 depicts name of companies providing insurance in each district. By working office, definitely 72% respondents mentioned Shikhar was leading organization followed by NECO and Himalayan General in equal weight by 8%. Respondents, from 2070-71 to date, 80% were working with single insurance office while 17% and 3% mentioned that working with two and three companies. The main reason of changing insurance office, they mentioned that proximity to both agents/staff and offices, beliefs on services. When company not interested to work in particular party or crop, sometimes, respondents said change of organization.

**Table 7: Name of companies provided crop insurance policy**

	Name of company	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
By organization	Shikhar	53.13	1.56	4.69	0	12.5	71.88
	NECO	4.69	0	3.13	0	0	7.81
	Krishi Bikash Bank				4.7		4.69
	Prudential		3.125				3.13
	Nepal Insurance	3.125					3.13
	Himalayan general				7.8125		7.81
	Joint (Shikhar / Nepal insurance)	1.56					1.56
	Grand Total	62.5	4.69	7.81	12.5	12.5	100
By no of organization	1	45.31	3.13	6.25	12.5	12.5	79.69
	2	14.06	1.56	1.56	0	0	17.19
	3	3.13	0	0	0	0	3.13
	Grand Total	62.5	4.69	7.81	12.5	12.5	100

. Source: Household survey, 2021

#### 4.1.4 Providing crop insurance by mobilizing agents or staffs.

Table 8 depicts that 77 % respondents purchased policy from the staffs of the office and nearly 3.5 times lower respondents used agents fixed of the insurance office. The Shikhar insurance had policy of recruiting technicians (mostly JTA and Officers level) staffs and mobilize them into policy purchase, evaluation and loss estimation. Other companies used trained agents, basically from AKC, VHLKC, or agrovets, retired technicians in order to conduct whole crop insurance process and provided fixed charges as per Crop and Livestock Directive 2077”.



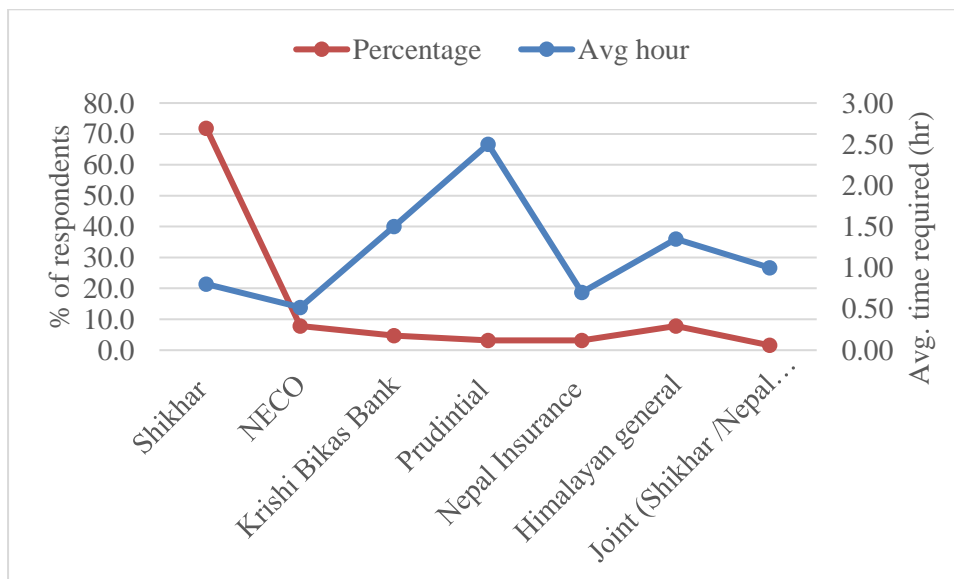
**Table 8: Purchase crop insurance policy via agents and staffs (org)**

District	Staffs	Agents	Grand Total
Chitwan	53.13	9.4	62.5
Makwanpur	1.56	3.1	4.7
Dhading	4.69	3.1	7.8
Kavre	4.69	7.8	12.5
Nuwakot	12.5	0	12.5
Grand Total	76.56	23.44	100

Source: Household survey, 2021

#### 4.1.5 Access to Insurance office, purchase insurance and charges

Figure 4 depicts types of insurance companies and average time used to take reaching their office to the respondents. Majorities of offices were concentrated in the city area and nearly the respondent took 0.52 hour (30 minutes) to 2.5-hour time, with the average of 0.9 hour (54 minute) (Appendix 5). Almost all respondents reported that they need at least 2-3 times travel to purchase and confirm a season crop policy. For renewing policy in the next time, however, said a trip might work when the technician convinced on field area, variety and technical specification. More frequent were the losses claim meant a greater number of visits they would face, which ultimately increased their transaction cost (communication, travel, and labor charges etc.). To save more frequent visit, some respondents said to pay extra charges to the agents. They reported upto Rs 1000-2000 fee while preparing insurance documents and making loss report.



Source: Household Survey, 2021

#### Figure 4: Access time to reach crop insurance service providers

Insurance Board reported that there were 842 branches of these insurances throughout the county for crop (also agriculture) insurance services. The oldest office was reported Nepal ICL and has largest branch offices (Bima Samiti, 2076). One district office not only in the inner terai district (Chitwan) but also in Mountain and hilly districts (Dolakha, Rashuwa, Ramechhap district, Dhading) not supportive fast access of insurance offices. This study confirms that a greater number of branch office encourages fast access to services and definitely a greater number of Rashia crop policies will be sold out in future.

##### *4.1.6 Types of crop policy demand, coverage and experience of farming*

Table 9 depicts that majorities of respondents purchased banana (45% respondents) followed by vegetables (25%), spring paddy (9.2%), and equal 5.2% insurers in potato, mushroom and wheat seed. One respondent each purchased policy of cardamom, coffee, papaya, kiwi, dragon fruit. Including all shows 156 ha coverage with the average of 1.7 ha per policy, with largest area recorded for banana (119 ha). The lowest land was recorded to mushroom farming. Information indicates most preferred sub-sectors for Bagmati Province. Among 19 policies under vegetables, Number of policies for crops were: tomato (5#), cucumber (3#), bottle gourd (2#), cauliflower (3#), capsicum (2#), chili (2#), cabbage (1#), and onion (1#). The Insurance Board has been endorsing 49 vegetable policies both in cost and value based, however neither insurer nor insuring companies launched it.

**Table 9: Types of crop policy, area coverage and experience of farming**

Sub-sector	Policy	Type of farming) *	Area (ha)	Avg area/policy	Average farming experience	Insurance type**
Vegetable	19 (25)	2	10.5	0.6	8.2	1
Potato	4 (5.3)	2	2.8	0.7	7.4	1
Spring paddy	7 (9.2)	1,2	2.6	0.4	13.9	2
Mushroom	4 (5.3)	3	0.8	0.2	8.0	1
Wheat seed	4 (5.3)	3	4.7	1.2	17.5	1
Banana	34 (44.7)	3	119.2	3.5	8.4	1
Dragon fruit	1 (1.3)	3	1.3	1.3	2.0	1
Kiwi	1 (1.3)	3	5.2	5.2	3.0	1
Strawberry	1 (1.3)	3	2.0	2.0	5.0	1
Papaya	1 (1.3)	3	2.0	2.0	3.0	1
Cardamom, coffee	2 (2.6)	3	5	2.5	1.8	1
Total/avg	76 (100)		155.9	1.7	7.6	

Note: Figure in parenthesis shows Percentage

\* Indicates 1= subsistence, 2= Semi-commercial and 3= commercial farming

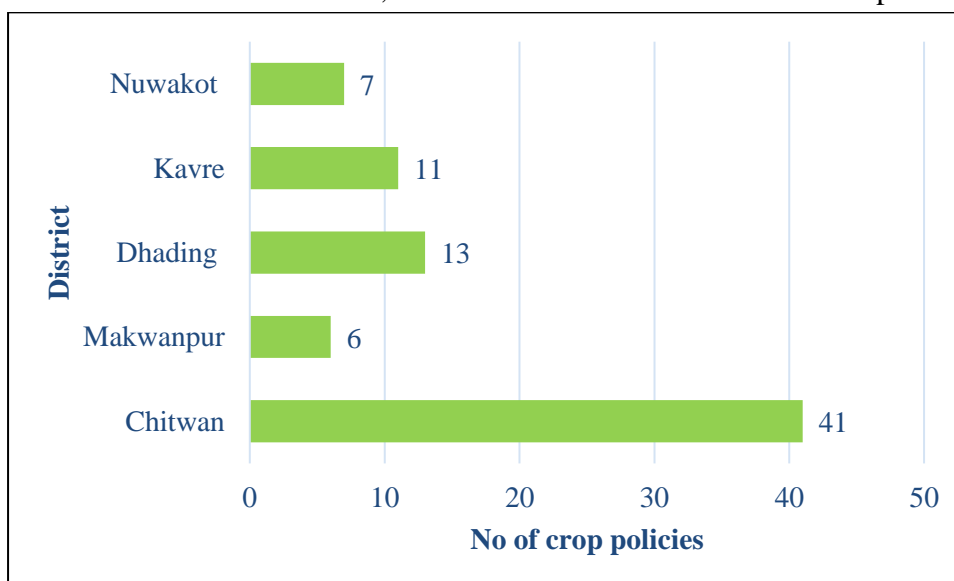
\*\* = 1: input cost approach, 2= production/ value based.

Source: Household survey, 2021.

We found potato (4 policy), Chaite Dhan (7), Mushroom (4), wheat seed (5), dragon policies. Average farming experience was reported 7.6 years for the indicated 11 sub-sectors. Relatively lesser farming experiences was recorded for cardamom, coffee, dragon fruit and kiwi, which the respondents reported start -up business. Study also linked sub-sector- based farming experience with the general farming experience of the insurers as per district. The detail analysis has been included in Appendix 6. Majority of the crop insurers had farming experience of 5-10 years (32.8%) followed by 25% for 10-15 years and < 5 years (23.4%). The mean, median, standard deviation and maximum experiences were 10.43 years, 9.5 years, 5.75, and 33.07 years, respectively. It shows that only experienced insurers were purchased the insurance products.

Except spring rice product, all surveyed respondents purchased input-based crop policies. FGD held in district offices revealed that central office of the insurance office did control in decision of input or value based. They reported problems in calculating established farm-gate prices and actual yield conditions, irrespective of the demand of the product-based types especially in vegetables. Few insurers of Nuwakot and Chitwan reported product-based insurance in ginger and citrus but they did not claim for losses. Detail list of input-type or value-based crop products are listed in Appendix 7.

Of the 76 policies sold, study reported 41 for Chitwan followed by 13 for Dhading and 11 for Kavrepalanchowk district. It meant, some of the insurers had more than 2 policies purchased at a time.



**Figure 5: Policies as per districts**

#### *4.1.7 Purpose of farming with purchasing crop policy*

Table 8 described general three types of farming types: subsistence, semi-commercial and commercial purpose of cultivating indicated sub-sectors. Table 9 depicts that majority of the crop insurers have reported crop insurance for commercial farming of strawberry, papaya, banana, wheat seed, kiwi, dragon fruit, papaya and cardamom.

**Table 10: Purpose of crop insurance**

District	Home consumption purpose	Semi-commercial	Commercial	Grand Total
Chitwan		1.6	60.9	62.50
Makwanpur		0.0	4.7	4.69
Dhading		0.0	7.8	7.81
Kavre		1.6	10.9	12.50
Nuwakot	3.5	1.6	7.4	12.50
Grand Total	3.5	4.7	91.69	100.00

Source: Household survey, 2021

Semi-commercial purpose partly explained (5%) for vegetables, potato, spring paddy and other high value crops. A few respondents of spring paddy growers in Nuwakot reported use it for home

consumption. It meant except spring rice, almost all insured crops were grown for market purpose. It meant, crop insurance and market sell variables have strong correlation for the insurers. In other words, one of the purposes of the government of Nepal is making commercializing through crop insurance policy was partly achieved.

#### 4.1.8 Types of land, land quality and relationship of land coverage

In order to do crop insurance, minimum cultivated land area required is 254.4 square meter in hilly region and 338.63 square meter in terai. How much area they are using for farming and insurance is shown in Table 11. Table illustrates the highest land of leased land irrigated type of 153 ha, which was 68% of the total land of 226 ha. The largest leased-in land of the insurer was reported in Chitwan followed by 9% in Nuwakot. By crop, leasing took place for banana farming, plastic tunnel farming and mushroom cultivation. Their own-land but irrigated land size was 70 ha (31%) of the total land they had occupied. By connecting land size with the findings of table 8, we can say that 68% land had been used for insured crops, as it is already mentioned in cultivation of 11 types of crops.

**Table 11: Types and size of land (in hectare) the respondents had**

District	irrigated _cultivated land	Non- irrigated cultivated land	Un-irrigated uncultivated	Irrigated lease in	Non- irrigated leased- in	Total land	Per HH land coverage
Chitwan	43.43 (19.2)	0.65	0	131.7 (58.2)	0.33	176.06 (77.7)	4.4
Makawanpur	12.55 (5.5)	0.6	0	0	0	13.15 (5.8)	4.4
Dhading	9.2 (4.1)	0.4	0.15	0.65 (0.3)	0	10.4 (4.6)	2.08
Kavre	3.1 (1.4)	0.65	0	1.15 (0.5)	0	4.9 (2.2)	0.6
Nuwakot	1.9 (0.8)	0	0	20 (8.83)	0	21.9 (9.7)	2.7
Grand total	70.18 (31)	2.3	0.15	153.48 (67.8)	0.33	226.45 (100)	3.5

Note: Percentage in parenthesis

Source: Household survey, 2021

The crop insurers further asked the question of using land for the production of non-insured crop production. It was rational since insurance products they were chosen were less than six-month period. Other matter they pointed out that irrigated land they often use in insured crops cultivation but non-irrigated one and marginal land also they kept fallow in winter and summer season. In fact, uninsured

crops they reported were main season paddy, maize, vegetables in home garden, wheat for grain purpose, pulses and other indigenous crops as well as fodder crops/forage for livestock farming, which they used to maintain intra-household food security purpose. Details of additional crops grown by the insurers is explained in Appendix 8.

#### 4.1.9 Crop insurance contract type

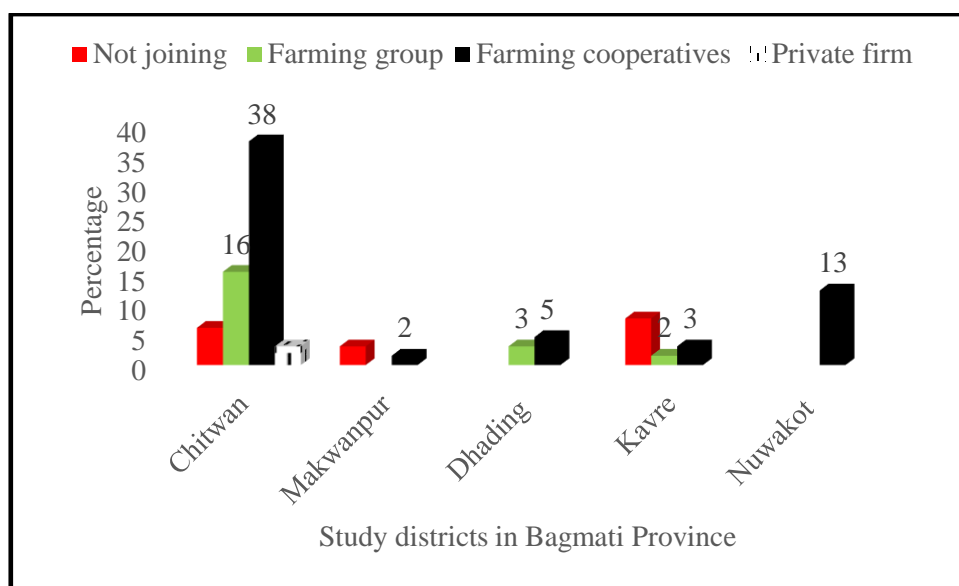
Table 12 illustrates types of contracts the insurers have been purchased in the study district. About 61% of the respondents purchased individual type, i.e., paid full premium rate that is indicated in the policy. Rest of the respondents, i.e., 39%, followed group approach by joining in the form of group members by 14% or purchased policy among the shareholders of cooperatives by 22%. Actually, group approach of purchasing insurance product was followed in Chitwan (36%) and Nuwakot (3.1%).

**Table 12: Crop insurance contract type made**

District	Individual approach	Group approach		Grand Total
		Farmers' group	Cooperatives	
Chitwan	26.6	14.1	21.9	62.5
Makwanpur	4.7	0.0	0.0	4.7
Dhading	7.8	0.0	0.0	7.8
Kavre	12.5	0.0	0.0	12.5
Nuwakot	9.4	0.0	3.1	12.5
Grand Total	60.9	14.1	25.0	100.0

Source: Household survey, 2021

Buying types of insurance contract can be correlated with the taking membership of the organization. Study found that 17%, 20% 59% and 3% of insurers did not join any organizations, joined in self-help farmer's group and cooperatives and private firms respectively (Figure 6). As illustrated in the figure, nearly 38% and 16% crop insurers of Chitwan joined in farming cooperatives and groups, respectively. Previously DADO and now called AKC, is responsible organization for organized farmers into groups or Agriculture cooperatives. Same organization perhaps they were using in purchasing group -type insurance approach. Individual insurers shared that they were registering their farm as a firm and involved in banana, coffee, strawberry production and marketing operations.



**Figure 6: Membership of the organization**

In the beginning of implementation of crop insurance, DADO (now is transformed as AKC) excessively gave priority of group-based insurance approach, which was well explained in “Crop and Livestock Directive 2069” and Microinsurance Policy of Insurance Board. For examples spring rice insurance by farmer’s groups in Kuntabeshi and Battar Nuwakot as well as potato insurance by the farmers of Panchakhal. Some of the AKC programme today have moving to entrepreneurship build up approach so that direct funding was taking place, such as one model farm in province constituent. Even today, executive board of Agriculture cooperative, farmer’s group were also purchased insurance in group approach in order to take 15% less funding approach provision in crop and livestock directives.

#### **4.2 Types of risk and uncertainties, coverage in the policy contract**

Study has assessed types of risk and uncertainties they had, ranking these risks.

##### **4.2.1 Types of risk and uncertainties and their ranking**

Table 13 shows the risk faced by the respondents in the study area. Among the different risks given to rank, covid-19 loss ranked as the highest followed by wind, hail and thunder loss as second and disease incidence as third most rank. Likewise, the top-seven factors were identified as the most important risk and uncertainty factors of crop growers in the Bagmati Province. Among these 14-types identified, the uncovered losses from the cost-approach policy of insurance companies are Covid-19 loss, decline in price, fail in technology, wild-life damage and theft aspect. Another point of risk coverage and claim problem for cost approach policy was damage/loss level identification: partial, moderate or 100% damage.

**Table 13: Ranking risk and uncertainty factors in crop**

S. N	Risk and uncertainty factors	Median score	Score	Rank order
1	Covid-19loss	2	0.85	I
2	Wind, hail thunder loss	1	0.84	II
3	Disease loss	2	0.77	III
4	Decline in seasonal price	2	0.76	IV
5	Insect pest damage	3	0.69	V
6	Rainfall	3	0.59	VI
7	Drought	3	0.56	VII
8	Fail in technology due to low training opportunity	4	0.42	VIII
9	Dew frost	4	0.37	VIII
10	Wildlife damage	5	0.36	IX
11	Fire damage	5	0.28	X
12	Environmental fog	5	0.28	XI
13	Theft	5	0.27	XII
14	Earthquake loss	5	0.25	XIII

Note: 1 to 5 indicates most important to fairly important risk and uncertainty factor

Source: Household survey, 2021

Most of the agents shared that it was easier to estimate losses for plant/tree basis and tedious to evaluate losses in terms of area basis. Loss estimation for seed -sowing types (such as rice, vegetables, seed production) was difficult. Thus, due care should be given to include all types of risks and uncertainties in the insurance policy.

#### *4.2.2 Perceptions of respondents on believing on solving those issues by insurance*

Table 14 shows on beliefs of respondents on solving the most of the risk and uncertainties ranked by the respondents. Among the options given, 34% respondents said “yes or possible”, while 63% said that partially it was possible. It shows that if covered almost uncertainties of the field.



**Table 14: Percentage of farmers perceived on believing on solving issues by insurance**

District	No	Partially	Yes	Grand Total
Chitwan		35.9	26.6	62.5
Makwanpur	1.56	1.6	1.6	4.69
Dhading		6.3	1.6	7.81
Kavre		9.4	3.1	12.5
Nuwakot		9.4	3.1	12.5
Grand Total	1.56	62.5	35.9	100

Source: Household survey, 2021

#### **4.2.3 Awareness on cover, uncover, claim process of insurance policy**

Current insurance policy has covered non-preventable risks such as natural fire and lightning/thunder, storms, hailstorm, earthquake, cyclone, typhoon, tempest, insect and disease pest, landslide, wind, inundation, flood, drought, frost, and dry spells.

**Table 15: Awareness on cover, uncover, claim process of insurance policy**

District	Partially have	Moderately have	Completely have	Grand Total
Chitwan	7.8	37.5	17.2	62.5
Makwanpur	1.6	3.1	0.0	4.7
Dhading	0.0	6.3	1.6	7.8
Kavre	4.7	6.3	1.6	12.5
Nuwakot	1.6	10.9	0.0	12.5
Grand Total	15.6	64.1	20.3	100.0

Source: Household survey, 2021

Crop insurer were well aware in covered risk in the policy, however, had a lot of restrictions in the policies which they had pointed conditions. If ranking all kinds of these factors, there are other local risks such as losses from stray animal, wild life (wildlife damage), theft and others are not included. It means, respondents did not respond it. Table 15 depicts either the respondents had awareness on risk cover and uncover and its claim process. Of the responses, 64% had moderate information followed by complete idea for 20% respondents. About 16% have partial information of risk coverage from the policy.

#### **4.2.4 Realization of farmers on transferring of risk if insurance done**

As shown in Table 16, almost 50%, who were regular payers of premium, said “yes” while other in cross-road said “partial” and about 5% realized it as “No”. Transferring the risk from one party to another was the realization issue. Since majority of the crop insurers did not take training opportunity, then it might hard to remind.

**Table 16: Realisation of transferring risk from premium payers to receiver company**

District	No	Partially	Yes	Grand Total
Chitwan	1.6	23.4	37.5	62.5
Makwanpur	0.0	3.1	1.6	4.7
Dhading	0.0	1.6	6.3	7.8
Kavre	3.1	6.3	3.1	12.5
Nuwakot	0.0	12.5	0.0	12.5
Grand Total	4.7	46.9	48.4	100.0

Source: Field survey, 2021

There are many principles of risk management: avoidance, loss control, risk retention and risk transfer (Trieschmann, Hoyt and Sommer, 2005). Since first three principles not applicable in crop farming, respondents use transfer of risk as the first based principle. Farmers need broad horizon of thinking about how risk premium and insurance premium are almost same. Because of poor background of doing insurance, it may be saying not exactly similar to the concept of premium payment. Other matter of poor understanding is not getting indemnity on time and faced problem in fulfilling loss claim conditions.

#### **4.2.5 Responses related to unacceptable policies to farmer's field condition**

Table 17 illustrates the responses analyzed for unacceptable policies which are included in the policy. Insurers were worried on uncovered five risks: damages caused by wild animals and stray animals (92%), post-harvest loss (84%), theft (46%), jealousy (16%), and loss of order (17.2%). Majority of the area had monkey, wild boar and stray animal losses, which are caused in the evening and nights times. Theft was also regular in banana and vegetable cases, which they said impossible control in the night time. Other uncovered but most important part the respondents pointed was post-harvest losses. Thus, effectiveness of crop insurance would be increased in case these factors to be incorporated in the policy.

**Table 17: Responses related to unacceptable to your condition**

Policy points	Frequency	Percentage
Damage from money and wild animals	59	92
Theft	29	45.7
Jealousness	10	15.6
Loss of order	11	17.2
Postharvest loss	54	84.4

Source: Field survey, 2021

#### 4.2.6 Ranking satisfaction in cover and uncover risk types

Ranking on satisfaction in cover and uncover in risk indicated in the specific crop policy. Table 18 depicts ranking of response of the respondents. Of the respondents, 41% were satisfied with the cover and uncover part of risk types. However, almost one-third were neutral in response. Rest percentage of respondents ranked dissatisfaction about due to uncovered field factors as mentioned in Table 17.

**Table 18: Ranking satisfaction in cover and uncover risk types**

District	Strongly dissatisfied	Dissatisfied	Neutral	Satisfied	Strongly satisfied	Grand Total
Chitwan	1.6	12.5	21.9	25.0	1.6	62.5
Makwanpur	0.0	1.6	1.6	1.6	0.0	4.7
Dhading	0.0	3.1	3.1	1.6	0.0	7.8
Kavre	0.0	3.1	3.1	6.3	0.0	12.5
Nuwakot	0.0	0.0	4.7	6.3	1.6	12.5
Grand Total	1.6	20.3	34.4	40.6	3.1	100.0

Source: Field survey, 2021

#### 4.3 Measurement of moral hazard in crop insurance

Study assessed the behavior of crop insurers, agents and insuring companies about the insurance business. There were many reports of conflict of interest (CoI) and its trade-off management. Moral hazards associated with the technician/agents, farmers and insurance office. However, it was tough job of collecting proofs from their expressions via interview schedule, FGD and KII, study analyzed the question to the respondents about to spend the planned cost rightly in the production. Some production-based issues are analyzed for producers as well as company case, are explaining in following tables. Issues were raised by the local insurance office especially in multi-harvesting crops and mushroom. Study has prepared detail reports loss claims

##### 4.3.1 Status of spending planned costs/inputs in crop production

The contract of crop insurance policy came in effect when the crop planted or transplanted well in the field. Study collected a sample policy photocopy of cost of production (CoP) sheet from the local insurance office (Appendix 9) and used it to akin real expenditure in insured period. About 61% of the crop insurers, particularly 50% from Chitwan confirmed that they were using total cost, some respondents said that Agriculture technicians did not use market price and insured sum or cost per plant was insufficient to meet the planned program (Table 19). About 39% crop insurers, mostly 31% from Chitwan, said expenditure range between 75 to 100%. Those respondents might spend less than planned cost. Actually, there were not the progress report prepared by those insurers.

**Table 19: Spent planned costs/inputs in crop production**

District	Spent around 100%	Spent 75-100%	Grand Total
Chitwan	31.25	31.25	62.5
Makwanpur	1.56	3.13	4.69
Dhading	6.25	1.56	7.81
Kavre	10.94	1.56	12.5
Nuwakot	10.94	1.56	12.5
Grand Total	60.94	39.06	100

Source: Household survey, 2021

Asking other question to the respondents, do you spend more amount than that planned budget of insured sum? Two respondents out of sixty-three said additional investment than that estimated in the insurance policy contract. They shared unexpected cost rise in fencing boundary of the insured farm. Due to no coverage of theft in insurance, other farmers said a lot investment to be invested in fencing farm.

#### **4.3.2 Reporting loss, time of claim and documentation of loss claim**

Study analyzed the responses reported by the respondents are given in Table 20. 44% farmers did not claim the losses and other 3% did not face any problem.

**Table 20: Perceptions of insurers on facing problems in receiving claim**

Status and hassle	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
Not yet claimed	14.1	3.1	6.3	9.4	10.9	43.8
Faced losses and planning to apply	1.6	0.0	0.0	0.0	0.0	1.6
Just applied	4.7	0.0	0.0	0.0	0.0	4.7
Indemnity received with hassle	40.6	1.6	1.6	3.1	0.0	46.9
Not faced any problem	1.6	0.0	0.0	0.0	1.6	3.1
Grand total	62.5	4.7	7.8	12.5	12.5	100.0

Source: Household survey, 2021

They reported partial losses but because of policy restrictions, did not complain the losses. 47% farmers received the reimbursement with the hassle.

#### **4.3.3 Perception of crop insurers on reporting on agency and period of loss**

Almost (97%) of the crop insurers contacted staffs of the office in order to report the losses. Just few insurers (3%) contacted agents, particularly the staff of AKC (Table 21).

**Table 21: Response of insured people to report crop loss**

District	Reporting loss to		Time of informing damage				Grand total
	Agent of AKC	Staffs of insurance office	As soon as seen	Within week	Within fortnight	Within 35 days	
Chitwan	2.8	83.3	72.2	11.1	2.8	0.0	86.1
Makwanpur		2.8	0.0	0.0	0.0	2.8	2.8
Dhading		2.8	2.8	0.0	0.0	0.0	2.8
Kavre		5.6	2.8	0.0	0.0	2.8	5.6
Nuwakot		2.8	2.8	0.0	0.0	0.0	2.8
Grand Total	2.8	97.2	80.6	8.3	2.8	5.6	100.0

Source: Household survey, 2021

Duration of informing crop damage has been explained also in Table 13. It shows that 81% crop insurers reported as soon as seen the damage. Among minority respondents, 8.3% of total said waiting of one week, fortnight (3%) or even within 35 days (5.6%). Those, reported late to the office, shared that they had poor exposure and tenure farming experience of disease particularly in vegetable, mushroom and cardamom cultivation.

#### 4.3.4 Tentative report preparation days for loss claim

**Table 22: Tentative duration of loss report preparation for indemnity claim**

District	Within fortnight	Within 35 days	Within 2 months	Grand total
Chitwan	19.4	63.9	2.8	86.1
Makawanpur	0.0	2.8	0.0	2.8
Dhading	2.8	0.0	0.0	2.8
Kavre	0.0	2.8	2.8	5.6
Nuwakot	0.0	2.8	0.0	2.8
Grand total	22.2	72.2	5.6	100.0

Source: Household survey, 2021

Table 22 shows that reports are prepared within the 35 days which the 72% insurers reported. About 19% reported the incumbent prepared loss report within the fourth night and 6% even prepared it within two-month period. Those preparing late time, if not wrong, revealed that because of poor support from Agriculture technicians.

#### 4.3.5 Factors of delay reporting claims

For loss claiming process, crop insuring farmers faced early report preparation and its submission. Almost 50% of the respondents (majority from Chitwan district) reported delay in visit of technicians

or agents so that it affected in report submission. Insurance office demanded loss/crime scene report (*Muchulka*) mandatorily signed by the local authority along technical report. About 19% said problem of getting technical report from the staffs/agents. Other important matters were delay response of agents, and technicians of the AKC (Table 23).

**Table 23: Problem in technical report preparation**

District	Chitwan	Makawanpur	Dhading	Kavre	Nuwakot	Grand Total
Technical report preparation from the technicians /AKC staffs/local body	16.7				2.8	19.4
Unresponsive crop technician of AKC	5.6					5.6
Delay response of agent	16.7	2.8	2.8	5.6	0.0	25.0
Delay in visit of technicians and agents	47.2					47.2
Grand Total	86.1	2.8	2.8	5.6	2.8	97.2

Source: Household survey, 2021

#### **4.3.6 Moral hazard of insurance companies and staffs**

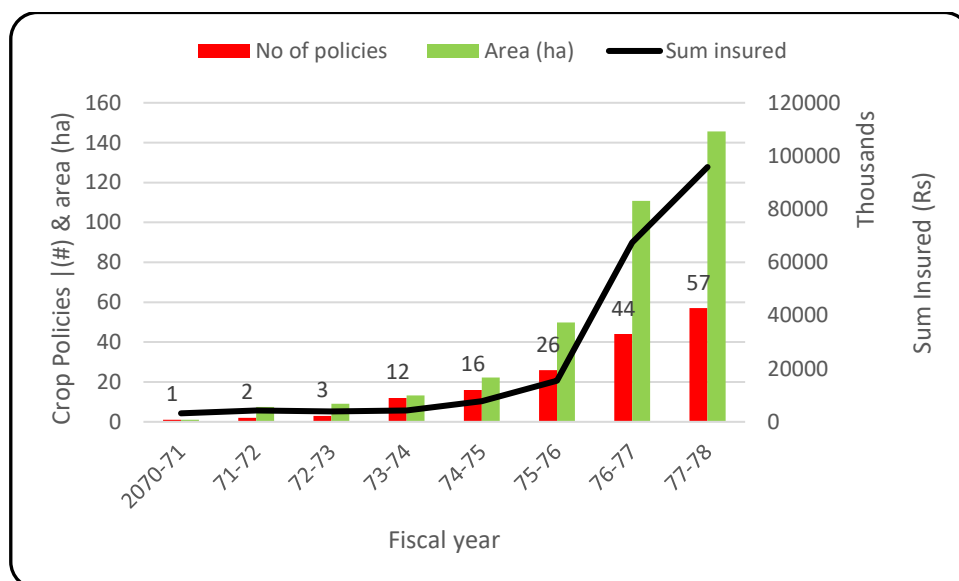
Both technicians or agent and insurance companies had moral hazard. Farmers in study districts shared bitter experiences about the both agents and companies gave priority in non-agriculture, livestock, poultry and crop insurance. Ghimire et al (2020) pointed that the companies earned higher premium even for a milch cattle when its valuation occurs around NPR 1 lakh. If they insure about 10 animals only, they receive quite a lot premium compared to crops whose valuation lesser and very tedious. Further, insurance agents preferred doing livestock insurance not only for the commission i.e., 10% of the premium they would get but also for the chance of additional self-earning while providing their own technical services like vaccination, dystocia, etc., which wasn't included under insurance. Causes of indifference in low crop policy was more attractive package at non-crop-based insurance products. Moreover, both the agents and insurance companies were taking benefit of ignorance of farmers, inability of understand numeric technique of loss estimation for seed-sowing types crops in comparison to line planting crops and animal cases.

#### **4.4 Assessment of effectiveness analysis of crop insurance**

Effectiveness measures adequateness of producing the intended purpose or expected results because of multi-hand initiatives in improved insurance practices. Right decisions of purchasing insurance, situation-based decisions, regularity in premium payments, timely reporting, low moral hazards and regular running it as business as well as stable market are effectiveness indicators.

#### 4.4.1 Analyzing growth rate and compound growth rate of crop insurer

Figure 7 and data shown in Appendix illustrate crop policy trend, area coverage of the insured farming, sum insured, premium charges collection, premium paid, loss estimated and no of claims of the respondents. Increased number of crop policies (from 1 in 2070-71 to 57 in 2077-78), increased area coverage of crops, increased insured sum from Rs 3.2 to 67.48 million, etc. counted that it will continue in the increased trend in future. Average value of insurance has been increased in latest three-year. Likewise, amount of premium charges collection, and government subsidy in premium, claim amounts of respondents were subsequently increasing over the record period.



**Figure 7: Crop policies, farming area and sum insured in last seven year**

Source: Household survey, 2020

Further analysis on types of grown, growth of sum insured, area coverage, premium charges collection and loss claim is shown in Table 24. Interestingly, crop insurance roadways in Bagmati Province started from the banana insurance done by Mr Bamdev Adhikari of Chitwan in 2070-71. Farmers in 2071/72 - 2072/73 did insurance of banana and vegetables. Then after, the number of crops brought into insurance programme. Annual growth rate of these indicators was encouragingly upward, however, growth rate of loss claim was not consistent because of unsure loss claims. The compound growth rate of sum insured was recorded 4.21% while its area increment was 8.03% considering established growth rate from FY 2072/73.

**Table 24: Annual and compound growth rate of crop insurance in the study area**

FY	Crops insured	Sum insured (Million)	Area (ha)	premium collection (Rs)	Loss claim (Rs)
2070/71	Banana	-			
2071/72	Banana, capsicum	32.81	650.00	32.81	5900.00
2072/73	Banana, cauliflower	-6.59	21.33	-6.59	-86.77
2073/74	Banana, capsicum, cauliflower, cucumber, spring rice, tomato, cardamom	7.87	45.60	7.87	-39.55
2074/75	Banana, bottle gourd, cucumber, mushroom, potato, tomato, wheat seed, cabbage, coffee, cardamom,	82.51	67.92	82.51	650.00
2075/76	Banana, strawberry, dragon fruit, papaya, cucumber, cabbage, tomato, potato, mushroom.	98.54	123.69	98.54	-17.17
2076/77	Banana, citrus, cucurbits, cauliflower, mushroom, potato, spring rice, tomato, wheat seed	334.85	122.76	334.85	1347.50
2077/78	Banana, cauliflower, capsicum, chili, mushroom, potato, spring rice, tomato, wheat seed	42.02	31.39	42.02	-91.43
CGR		4.21	8.03	4.21	

Source: Household survey, 2020

#### **4.4.2 Factors motivating buying insurance contract**

Table 25 depicts that 42% responses in feeling uncertainty and risk factors, followed by 33% said self-realization of loss cover. Both of these indicators were taken as major driving factors.



**Table 25: Motivation factors of buying policy contract**

Motivation factors of buying policy contract	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
Self-realization of loss cover	21.9	1.6	1.6	6.3	1.6	32.8
Feeling uncertainty/risk factors	28.1	3.1	6.3	1.6	3.1	42.2
Agent of insurance company	7.8	0.0	0.0	1.6	1.6	10.9
AKC/mass media	4.7	0.0	0.0	3.1	6.3	14.1
Grand Total	62.5	4.7	7.8	12.5	12.5	100

Source: Household survey, 2021

#### 4.4.3 Assessing premium affordability of the policy holders

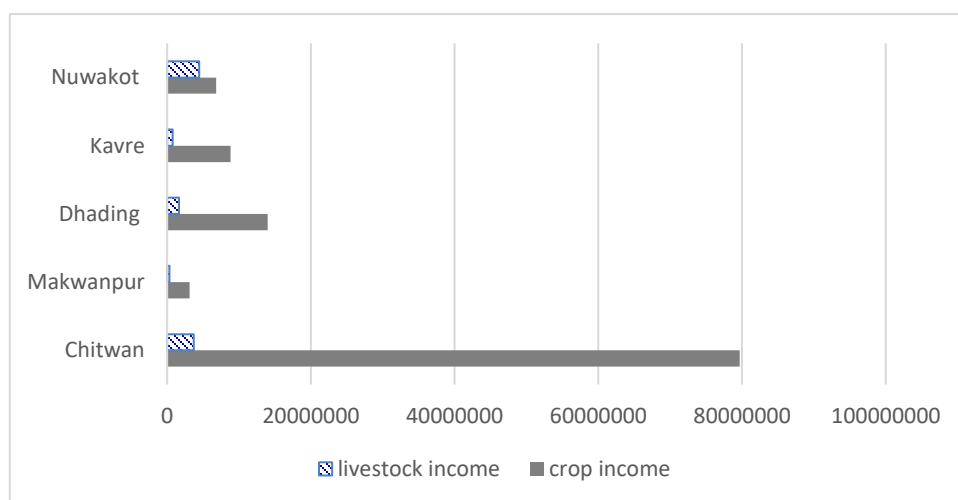
Price of policy for specific product was asked to the insured respondent about the affordability of the subsidized premium. Currently they were paying about 25% of the premium cost, which was 1.5% charges of production cost and rest 75% had been complementing by the government, which the insurance companies are claiming as the regular process.

**Table 26: Perception of respondents on premium affordability**

District	Partially	Yes	Grand Total
Chitwan	3.1	59.4	62.5
Makwanpur	0	4.9	4.7
Dhading	0	7.8	7.8
Kavre	3.1	9.4	12.5
Nuwakot	0	12.5	12.5
Grand Total	6.2	93.8	100

Field survey, 2021

Table 26 shows that about 94% respondents said able to afford it. The minority (6.2%) of respondents especially of Kavre and Chitwan cereals and mushroom farming said that it was partially comfortable to pay it, otherwise they are also requesting local and provincial government to complement it. Those farmers gave example of Gandaki Province where almost crop insurers get topping subsidy over the support of MoALD/MOF. Their affordability condition was also assessed by estimating annual income they were earning from the on-farm and off-farm activities, is shown in Figure 8. Average income from agriculture was estimated 1.9 million, which entailed that no need of further support. However, attracting low-income farm household was prime issue.



**Figure 8: Estimated income of respondents**

#### ***4.4.5 Assess gap in claim loss and payment of indemnity***

The respondents faced and claimed losses one to three times in the insurance life. All loss claim applications report, collected at district insurance office, sent to Kathmandu office. The concerned staffs reassessed the report and finally came into reimbursement. Figure 8 compares the loss estimate figure reported by the producers and indemnity amount they received from 2070 to 2077 period. Actually, first loss claimed received amount since 2072/73. Loss estimation was Rs 14.98 million for 64 respondents, among with highest for Chitwan district (Rs 10.74 million) while reimbursement was estimated Rs 6.8 million, with the deficit of Rs 8.2 million. The percentage of indemnity payment was reported 55%, 45%, 4.8%, 27.8%, 43.3%, 45.4% for Chitwan, Makwanpur, Dhading, Kavre, and Nuwakot district, respectively. Extremely small figure of imbursement had distracted farmers in purchasing future contract. May be crop insurers claimed full loss but companies valuated it as partial or no loss method.

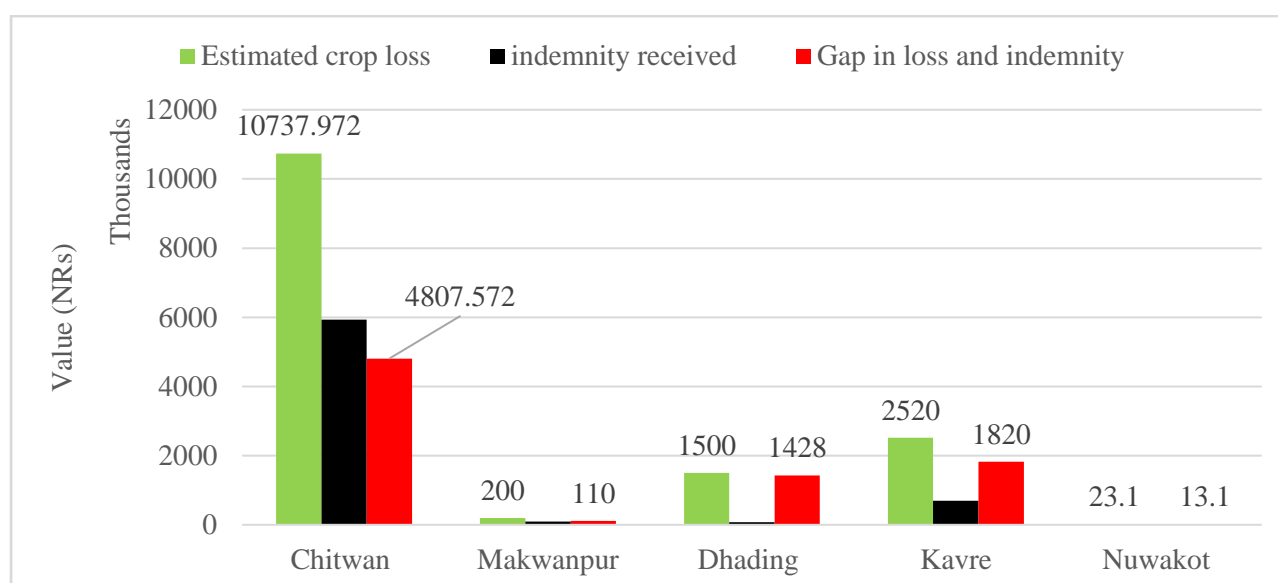


Figure 9: Estimated crop loss, indemnity amount and gap

When the payments were less than the estimated at field, its very hard that effectiveness of the crop insurance was running.

#### 4.4.6 Assessment of enrollment factor in crop insurance

Table 27 depicts response of farmers affecting to purchase crop insurance products. About 77% farmers reported no any enforce in doing insurance. Among them, 52% were from Chitwan. Our FGD and KIS also revealed that banana, mushroom entrepreneurs and proprietors of large infrastructures (such as tunnel farming and mushroom) and wheat seed growers were continuing premium regularly. In Chitwan, banana farming has been affected by wind every-year and crop insurance was best alternative coping strategy of getting cost recovery.

**Table 27: Response of respondents on any force factor affecting crop insurance**

District	No	Yes			Sub-total	Grand Total
		Bank loan	Coop/finance loan	Programme requirements and		
Chitwan	51.6	9.4	1.6	0.0	10.9	62.5
Makwanpur	3.1	1.6	0.0	0.0	1.6	4.7
Dhading	7.8	0.0	0.0	0.0	0.0	7.8
Kavre	4.7	4.7	0.0	3.1	7.8	12.5
Nuwakot	9.4	3.1	0.0	0.0	3.1	12.5
Grand Total	76.6	18.8	1.6	3.1	23.4	100.0

Source: Household survey, 2021

In a process of large investment, some agriculture cooperatives and private entrepreneurs were taking bank loan. In this process, 19% respondents said bank loan was the factor of attaching in crop insurance. Likewise other government programme (such as one model farm in a provincial constitution, *Brihat Chaite Dhan* Programme) of AKC /Previous DADO Programme) and Micro-insurance programme of ADB via Small Farmer's Cooperative Development also enforced farmers in purchasing crop insurance (5%). About 19% respondents, who were taking loan for farming, were consulting: ADB, Sana Kisan Sahakari Sanstha, Rastriya Banjya Bank, Civil Bank, Nepal Bangladesh Bank, Kamana Bikas Bank, Century Bank, and Sanima Bank. It means one-fifth of the respondents purchased insurance as per process of mandatory policy. When, loanee members requested bank for loan especially for infrastructure and crop, they hold insurance companies in long duration and request for large fund reservation for banking purpose. It has built of a charge to the insurance companies that insurance companies only favoring larger entrepreneurs.

#### 4.4.7 Tentative period of receiving indemnity

Aim of collecting data was either any gap between crop loss claims and the receiving duration of reimbursement. Even though unlike to report it, 68 reports in last 6 years (except 2072-73), gap in payment period cross a year. Counting frequencies of delay in payment crossing more than six months were exceeding 40 cases, the insurer reported (Table 28). Some claims were still in pending period and average pending period was 6-10 month depending on the types of insurance. Both Crop and Livestock Directive 2013 and 2021 as clearly mentioned and committed in timely payments of any claims. Payments in line -planted crops (fruit) was faster and easier than multiple harvesting crops.

**Table 28: Month of delays for payments of indemnity**

FY	Month of delays reported for indemnity										Average
	3	4	5	6	7	8	9	10	11	12	
2070-71	4	1	3	5	0	6	4	3	2	6	3.4
2073-74	1	0	0	0	0	0	0	0	0	0	0.1
2074-75	1	0	0	0	0	0	0	0	0	0	0.1
2075-76	1	0	0	1	0	1	0	0	0	0	0.3
2076-77	1	1	3	4	0	5	4	2	2	6	2.8
2077-78	0	0	0	0	0	0	0	1	0	0	0.1
Total	8	2	6	10	0	12	8	6	4	12	68

Source: Household survey, 2021

#### 4.4.8 Assessment of crop insurance and claim loss duration

In order to check “Had insurers moral hazard in terms of insurance continuation over the claims?” Table 29 elaborates database of seven-year period of study. The insurers said that 28.1%, 29.7%, 19%, 16%, 3%, 3% and 2% had joined in insurance in one year, two year, three, four, five, six and seven years, respectively. Among the participants, share of the Chitwan is higher. In order to answer “are insurers claim indemnity always?”, study recorded that 42.2% faced no or partial loss but not claimed losses,

while 37.8% of the respondents one time of the insurance period. Likewise, 16% and 5% of the respondents claims faced losses two times and three times of the insurance period. It shows that facing losses and claiming loss were not going like moral hazard.

**Table 29: Period of insurance and claim**

Duration of insurance (Year)	District					Grand Total
	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	
1	10.9	1.6	4.7	0.0	10.9	28.1
2	25.0	1.6	0.0	3.1	0.0	29.7
3	15.6	1.6	0.0	0.0	1.6	18.8
4	6.3	0.0	1.6	7.8	0.0	15.6
5	1.6	0.0	0.0	1.6	0.0	3.1
6	3.1	0.0	0.0	0.0	0.0	3.1
7	0.0	0.0	1.6	0.0	0.0	1.6
Grand Total	62.5	4.7	7.8	12.5	12.5	100.0
<b>Loss faced period</b>						
District	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
No faced losses/claimed	17.2	3.1	6.3	7.8	7.8	42.2
One year	28.1	1.6	1.6	1.6	4.7	37.5
Two years	12.5	0.0	0.0	3.1	0.0	15.6
Three years	4.7	0.0	0.0	0.0	0.0	4.7
Grand Total	62.5	4.7	7.8	12.5	12.5	100.0

Source: Household survey, 2021

#### **4.4.9 Assessment of maximum loss month and causal factors of losses**

Study recorded most of the crop loss months in last six-year period as per insurers recalled about the losses and period associated on it (Table 30). Throughout FY 2072/73 to 77-78, months like 24 cases in Baisakh, 14 cases in Jestha and 11 cases in Chaitra among the other months in a year. They said partial to No cases of losses felt in Autumn and winter month. Most factors of losses on these months were speedy wind along with hailstone (46 cases) and 10 losses by diseases (3 cases in vegetables, 2 causes in potato, and 5 cases of mushroom). Almost all banana insurers compelled to insure banana against the losses of speedy wind.

**Table 30: Assessment of loss month and causal factor of loss**

	Reported loss month	Fiscal year						
		2072-73	2073-74	2074-75	2075-76	2076-77	2077-78	Total
Crop losses month	Magh				1			1
	Phagun			1			3	4
	Chaitra		1		1	5	4	11
	Baisak				4	18	2	24
	Jestha	1	1		2	8	3	14
	Asar					1	0	1
	Shrawan					1		1
	Total in a year	1	2	1	8	33	12	56
	No of polices	2	4	15	21	29	44	58
Causal factors		2072-73	2073-74	2074-75	2075-76	2076-77	2077-78	
1	Disease		2	1	3	3	1	10
2	Thunder /wind	1	0	0	5	30	11	46
	Total	1	2	1	8	33	12	56

Source: Household survey, 2021

#### **4.4.10 Perception of respondents in effectiveness of crop insurance before and with insurance**

Study made 13 effectiveness indicators such as investment confidence, loss cover, learnt scientific learning in farming, etc and their response analysis are shown in Table 31. Analysis revealed that respondents perceived Average effectiveness in 12 indicators showed 41.7% change they perceived. They had employed relatively greater number of hired labor and increased investment for improved seed, equipment, and technology. In comparison to not-unsured period to date, 83% respondents said increased investment confidences, with enhanced changes about 14%. Additional 18 respondents began crop business taking loan from the nearest banks for insured crop cultivation. Thus, joining insurance has built of quadrilateral relationship among growers, government, insurance companies and banks. Majority (97%) of the respondents, thus, realized the cumulative efforts of Government of Nepal, Insurance Board and Insurance companies to access crop insurance in their farming gate/ around to district gate. About 83% farmers, who were partly receiving indemnity, reported covered losses, especially from zero in the past to something more now, with perceiving 24% improvement. About 100% farmers said arranging premium even for crop as new practice but continuity in crop insurance assured by 47%. They were aware not only in crop and livestock insurance but also, they felt that their life was in peril. It pinched starting life and health related insurance, with and without government support. Respondents realized lesser improvements in learnt scientific farming, coordination with crop technicians, yield improvement and aspects.

**Table 31: Changes with and without involvement in insurance**

S.N.	Indicators of measuring effectiveness	Frequency	% of response	% Change
1	Increase investment confidence	53	82.81	14.1
2	Covered loss	53	82.81	23.7
3	Learnt scientific farming	25	39.06	7.8
4	Paid crop premium regularly	30	46.88	47
5	Build of coordination with crop technician and allied office	35	54.69	15.9
6	Receiving government & insurance office support for premium subsidy	62	96.88	85
7	Transfer farming risk	12	18.75	7.2
8	Increment in hire labor	55	85.94	46.9
9	Cost increase in seed & technology	35	54.69	70.3
10	Increase in capital cost	33	51.56	91.0
11	Increase transaction cost	25	39.06	39.1
12	Increase crop yield & income	18	28.13	7.3
13	Stablish income by crop insurance	9	9.38	NA
	Average changes	34.2	53.13	41.7

Source: Field survey, 2021

Crop insurance had also increased negative aspects. Unintentionally, transaction cost increased by 39% because of increase in communication cost, transport cost, and management cost. Unlikely below than 20% improvements perceived: 16% of total in coordination with crop technicians, 7.3% in crop yield and income, 7% perceived transfer of risk, and 8% more learnt scientific farming. Although, these indicators were not included in the insurance contract, study collected these indicators might act as effectiveness analysis of the particular programme. We can say that these indicators, yet to be contributed in the crop yield, gross-margin and income stabilization as far as continuity of crop insurance.

#### ***4.4.11 Purchasing other types of life and non-life insurance products***

Table 32 shows that 45% farmers were purchased the insurance of many products such as life-insurance, livestock insurance, house, other insurance, with the total value of Rs 1.2 million premium payment. It was 4.09% value of insured sum. It meant that insurance is becoming the part of life and outreach of life and non-life insurance was tremendously increasing in Bagmati Province.

**Table 32: Involvement in other insurances products**

District	Involvement in other insurance programme		If yes, amount of premium paid of				
	No	Yes	life insurance	livestock insurance	house insurance	Other insurance	Total premium paid annually
Chitwan	34.375	28.125	242900	30375		10100	283375
Makwanpur	1.5625	3.125	605000	1236	20450	400	627086
Dhading	4.6875	3.125			18750	13750	32500
Kavre	6.25	6.25	115000	15000		1400	131400
Nuwakot	7.8125	4.6875	79500	20375			99875
Grand Total	54.6875	45.3125	1042400	66986	39200	25650	1174236

**4.4.12 Assessment in perceptions of respondents on crop insurance continuity or discontinuity**

Table 33 analyses the response about future continuation of purchasing insurance contract. Data shows that 72% respondents confirmed continuation of programme, Rest 8% said not sure decision means they were neutral while 20% other crop insurers confirmed not continuation.

**Table 33: Perception of the respondents about to continuity of crop insurance**

District	Not continue	Thinking	Continue	Grand Total
Chitwan	4.7	3.1	54.7	62.5
Makawanpur	3.1	0.0	1.6	4.7
Dhading	1.6	3.1	3.1	7.8
Kavrepalanchowk	1.6	1.6	9.4	12.5
Nuwakot	9.4	0.0	3.1	12.5
Grand Total	20.3	7.8	71.9	100.0

Source: Field survey, 2021

For the respondents, who said continuation of insurance, further asked reasons of continuation of the buying insurance contract. Interestingly, farmers 55% of the respondents in Chitwan and rest of the respondents from the other districts were used to adopt crop insurance. Major factors behind the saying continuity are explained in Table 35. About 61% respondents said that one of the causes of continuation of buying contract was due to state subsidy of 75% on premium charges. Federal government has allocated subsidy limit of 10 million for a charge of premium amount. Allocation limit was great for commercial farming if it wasn't used that public resource means counted as congestible resource. Likewise, 72% respondents, or 100% those said continuation of insurance, they would like to continue commercialization of the selected crops and would like to continue. Some respondents (28%) had



compulsory insurance package because of loan factor, would continue the insurance. Other factors were assured farm yield and income (41%), habitual in documenting and claim process (16%) and complement scientific farming (9%).

**Table 34: Indicators of wiliness to continue crop insurance**

S. N	Indicators of continuation of insurance	Frequency	Percentage
1	Exploit and use state subsidy	39	60.9
2	Habitual on documenting and claim process	10	15.6
3	Complement scientific farming	6	9.4
4	Facilitate compulsory insurance	18	28.1
5	Assure farm yield and income	26	40.6
6	Continue commercial farming	46	71.9
	Average	24.17	37.8

Source: Field survey, 2021

Further, determination in continuation of crop insurance was done by asking hypothetical question. Even after removal of state subsidy on premium charges, how many farmers will be ready to continue crop insurance. In Table 35, study made four indicators of measurement. Among these, 50%, 20%, 17%, 13%, of the farmers, who were confirmed in crop insurance, said continue even after removal of state subsidy, discontinue insurance, needs revising policy to continue, and discontinue after compulsory insurance phased out. At least 50% farmers confirmed that they would continue without any preconditions in the policy. The few farmers 17% suggested to revise policy, they were suggested policy amendment by including three points: marketing period, theft, and wildlife damage into a policy contract paper. Whatever farmers are asked herewith are commercial farmers, have skill and continuous touch with the insurance office and are deterministic in continuation of crop insurance.

**Table 35: Perceptions on continuing crop insurance after subsidy removal**

District	Discontinue	Discontinue after compulsory insurance phased out	Needs revising policy to continue	Continue	Grand Total
Chitwan	7.8	10.9	7.8	35.9	62.5
Makwanpur	1.6	0.0	0.0	3.1	4.7
Dhading	1.6	0.0	4.7	1.6	7.8
Kavre	1.6	1.6	4.7	4.7	12.5
Nuwakot	7.8	0.0	0.0	4.7	12.5
Grand Total	20.3	12.5	17.2	50.0	100.0

Source: Field survey, 2021

Among the adopters of crop insurance, study further asked the reasons of not continuing further insurance. The indicators that we fixed and percentage of response analysis are illustrated in Table 36. Among the farmers, 64% said that they were not satisfied with the product purchased in the last year. The second most important issue was coverage of very short period of time which 43% said as most important. In general, saying and suggestion, farmers suggested to cover marketing duration into policy contract. This issue was discussed with the staffs of Insurance Board and Insurance companies, they suggested to adopt production-based policy. In fact, consumers were demanding product- based contract by preferences, but local insurance companies sold input based.

**Table 36: Response of farmers (%) not continuing crop insurance**

Indicators of not continuing	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
Not satisfied the insurance bought last year	21.9	7.8	7.8	6.3	20.3	64.1
Coverage of very short duration	15.6	3.1	7.8	10.9	6.3	43.8
Got problem in claiming partial/ full loss	25.0	1.6	1.6	3.1	10.9	42.2
No trust of insurance agency/staff	7.8	7.8	6.3	6.3	10.9	39.1
Far from insurance office	7.8	3.1	4.7	3.1	9.4	28.1
Unfeasible for uncovered past dominant	7.8	3.1	4.7	7.8	0.0	23.4
Too expensive	0.0	3.1	4.7	4.7	0.0	12.5
Compulsory insurance phasing-out	1.6	1.6	1.6	3.1	3.1	10.9
Don't understand product	0.0	1.6	3.1	3.1	0.0	7.8
No need, cause of discontinue farming	0.0	1.6	1.6	1.6	1.6	6.3
No cash to pay premium	0.0	1.6	1.6	3.1	0.0	6.3
No sufficient land for insurance	1.6	1.6	1.6	1.6	0.0	6.3
Average	7.4	3.1	3.9	4.6	5.2	24.2

Source: Field survey, 2021

Other issue will be connected if output based would be the end option, meant higher premium charges. Even for input-based contract, 13% and 6% said expensive and low cash to pay premium charges,

respectively. To address this issue, local government in Nilakantha Municipality, Bidur Municipality and Bharatpur Municipality had taken initiatives of topping payments by 50 to 100% over federal government subsidy payments. Other local government if replicate in their area, definitely small holders and low-income farming households renew insurance. Not purchasing or buying contract was poor awareness on risk/uncertainty transfer. Unlike these responses, payments matter of insurance premium were not the big deal when study estimated Rs 1.9 million as average income even excluding farm income (Table 44 and Appendix 11). Other factors were: untrust companies (39%), uncover part dominant (23%), problem in claiming (42%), far from insurance office (28%), compulsory insurance phase-over (11%), poor understanding about product (8%), and no sufficient land for additional insurance (6%).

Some of the respondents said not understand product meant having not involvement in training. Results received in participation in training is presented in Table 37. It shows that 90% crop insurers were not taking insurance related training, while 9% of those reported taken training related discipline. Those who participated reported taken 5days training by a participant, 3-day training by 2 participant and a day orientation training by 3 participants in crop insurance.

**Table 37: Taken insurance related training**

Taken training	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
Not taken	57.81	4.69	4.68	12.5	10.94	90.62
Training taken	4.69		3.13		1.56	9.38
<b>Grand Total</b>	<b>62.50</b>	<b>4.69</b>	<b>7.81</b>	<b>12.5</b>	<b>12.5</b>	<b>100</b>

Source: Household survey, 2021

Those were taken more than one day training were license holders for crop insurance agent. Insurance office reported that some agents which are also doing crop farming were not purchasing crop insurance. It meant training was not the major point of continuing crop insurance but definitely it empowers majority by bringing positive vibes.

#### **4.4.13 Determinants of crop insurance continuation**

Study further used logistic regression model as empirical method to analyze factors affecting crop insurance in Bagmati province. Although sample size only sixty-four, power of explaining dependent variable might be inferior but we found balanced explanation of dependent variable: continue: in case probability of 1 and 0= otherwise. The significant variables in Table 38 are: food self-sufficiency, face crop loss, access time to reach insurance office, number of employed family in a house, type of farming enterprises, experience in farming, level of awareness on risk transfer and age of the household head among the 15 variables selected. Likelihood of estimation was -20.86 and LR Chi<sup>2</sup> was 31.76 with significant at 1% level. It meant model (Wald test) was significant by using Wald test, with pseudoR<sup>2</sup> = 43%. Probability of one year crop loss likely increase insurance continuity by 0.7 units, ceteris paribus.

*Table 38: Determinants of crop insurance continuation*

Continuity of crop insurance      1= continuous, 0: otherwise							
Log Likelihood = -20.86		No of obs		64			
		LR Chi <sup>2</sup> (11)		31.76			
		Prob> chi <sup>2</sup>		0.0008			
		Pseudo R <sup>2</sup>		0.43			
Variables are	Unit	Coeff.	Odd ratio	Robust Std Err.	z	P> z	
Food self-sufficiency	1:> 3 Month to 5 : >12 month	-0.569	0.57	0.278	-2.04	0.041**	
Face crop loss	# Year	0.77	2.16	0.437	1.77	0.076*	
Duration of insurance	# Year	-0.155	0.86	0.263	-0.59	0.553	
Land size	Ropani	-0.005	1.00	0.004	-1.22	0.222	
Reaching time to insurance office	Hour	-2.73	0.07	1.1	-2.48	0.01***	
Employed family at farm	# Family member	1.23	3.42	0.5799	2.13	0.033**	
Economically active member	# Family member	0.25	1.28	0.537	0.46	0.64	
Types of farming enterprises	1= subsistence, 2= semi, 3= commercial	1.72	5.58	0.64	2.66	0.008***	
Membership of organization	0: no, 1: group, 2: Cooperative, 3: firm	0.728	2.07	0.69	1.06	0.291	
Experience in crop farming	Years of farming	-0.25	0.78	0.126	-2	0.046**	
Education	Year of formal education	1.05	2.86	0.799	1.32	0.186	
Level of awareness on risk transfer	1: low, 2: moderate, 3: high	1.25	3.49	0.35	1.31	0.037**	
Ethnicity	1:B/C/T, 2: Jananati, 3: Dalit, 4: Madheshi	0.005	1.01	0.003	1.2	0.31	
Age	Year	-0.77	0.46	0.035	1.72	0.02**	
Gender of HH head	0 : female, 1 :Male	0.25	1.28	0.265	0.39	0.11	

Note: \* significant at 10% level, \*\* significant at 5% level, \*\*\* significant at 1% level.

Source: STATA results from Household survey: 2021

Detailed discussion in Table 30 revealed that 58% farmers faced continuous loss of 1-3 years, were applied for indemnity. If timely payment took place from the companies, there is no causes of discontinuing crop insurance. Other important significant variable was reaching time to insurance office. Increase one hour farther the insurance office, probability of crop insurance likely decreases by 2.7 units, ceteris paribus. Odd ratio pointed out it by 0.07 unit decrease in continuity in case every one minute of distance of branch office. This numeric value supported us to establish more branch offices in the Bagmati Province.

**Experience in crop farming** had likely inverse relationship in continuation of insurance, which was significant at 5% level. One year increase in farming would reduce the crop insurance continuation by 0.25 units, ceteris paribus. Pretty much logic would ne high experienced farmers cultivate would apply possible science and skill to coop up possible risks, thus less need of continuing crop insurance. Table 39 illustrates that nearly one-third respondents had farming experiences of 5-10 years and rest of 23%, 25% and 19% had farming experience of <5 years, 10-15 years, and >15 years, respectively. Average years of experience 10.44 years, Median= 9.5 years, standard deviation = 5.75, and variance 33.75.

**Table 39: Year of farming experience of crop insurers**

# of Year	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
≤ 5years	15.63	1.56	1.56	1.56	3.125	23.43
5-10 year	23.44	1.56	1.56	6.25		32.82
10-15 year	14.06		1.56	3.13	6.25	24.90
>15 year	9.38	1.56	3.13	1.56	3.13	18.75
Grand Total	62.5	4.68	7.81	12.5	12.5	100.00

Household survey, 2021

How many **economically active members** in the farm household had positive effect but wasn't significant in crop insurance continuation but **employed family -engaged at a farm** was significantly important at 5% level. Probability of additional one person engaged at a farm likely effect on crop insurance continuation by 1.23 unit. Odd ratio further evaluates effect by 3.42 times possibility of continuity, ceteris paribus. This finding quite represent discussion done with local insurance office. If additional human resources employ at farm increases commercialization and insurance need subsequently.

Food self-sufficiency (FSS) and continuity had negative relationship, it meant one unit change from one category to other (3 month to 6<sup>th</sup> month or 6 month to up..), continuity of crop insurance likely decrease by 0.56 unit. Results explained in Table <sup>8</sup>40 shows that around half of respondents (53%) had FSS less

<sup>8</sup> Food self sufficiency (FSS) is the measurement of own production by consumption and measured in percentage.

than three month and one-third of them sold food items. Since FFS discussed cereals (production demand vs production), our logistic regression might interpret in line with the results shown in Table 40. Higher would be the FFS means, less likely they are commercial and feel no need of crop insurance.

**Table 40: Food self-sufficiency status of the crop insured farmers**

District	< 3 month	3-6 month	6-9 month	9-12 month	>12 month	Grand Total
Chitwan	42.2	3.1	4.7	1.6	10.9	62.5
Makwanpur	1.6	0.0	0.0	1.6	1.6	4.7
Dhading	1.6	0.0	0.0	3.1	3.1	7.8
Kavre	1.6	1.6	0.0	1.6	7.8	12.5
Nuwakot	6.3	0.0	0.0	0.0	6.3	12.5
Grand Total	53.1	4.7	4.7	7.8	29.7	100.0

Household survey: 2021

Likewise, type of farming enterprises had likely positive effect on crop insurance. Since 88% respondents had commercial enterprises of banana, vegetables, potato, mushroom, strawberry etc, (Table 9) definitely FFS policy could replace the leased-in as well as own irrigated land. Thus, 1 % probability of transforming from subsistence to upward (semi-commercial to commercial) farming likely effect by 1.25 times higher for insurance continuity self-sufficiency.

**Education of the respondents** had positive effect on probability of buying insurance contract but showed insignificant relationship at 5% level. Although they were cent percent literate in education but this does not mean that they were financially literate. As shown in Table 40, median value of education lies for SLC level. Around 40% insurers had education higher than SLC/SEE (intermediate 25%, bachelor 6.3% and master 9%).

**Table 41: Education status of the crop insuring farm head (%)**

Education type	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
<5 years schooling	18.75			3.13	1.56	23.44
SEE /SLC	12.5	3.125	6.25	6.25	7.8125	35.94
Intermediate +2 level	18.75	0		3.13	3.125	25
Bachelor level	6.25	0				6.3
Master level	6.25	1.56	1.56			9.37
Grand Total	62.5	4.69	7.81	12.5	12.5	100

Household survey: 2021

Majority of the higher degree respondents were from Chitwan. Higher education would have high impact in insuring crop but sharing of staffs working in crop insurance said that “Higher the education,

much time needed for his/her motivation than that time required for uneducated farm holders. Meaning that education was not the most effective variable in insurance adoption case. Ultimately, value of insuring was the major matter in joining and continuing crop insurance.

**Age of the farm head** had negative but significant relationship with the continuation of crop insurance. Empirically, one year increase of his/her age likely decreased probability of crop insurance continuity by 0.77 unit, with its odd value 0.46. Shown in Table 42, almost of the farm head (89%) doing crop insurance had age group of 16-59 years. Heads above than 60 years were one-tenth. The more the economically active person at home meant higher active they were in income earning from on-farm and translated it into purchasing crop policy too.

**Table 42: Age of farm head in percentage (%)**

Age group	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
Economically active (16-59 year)	53.13	4.69	7.81	12.5	10.94	89.06
≥60 years	9.38	0.0	0.0	0.0	1.56	10.94
Grand total	62.5	4.67	7.81	12.5	12.5	100.00

Source: Household survey, 2021

Table 43 mentions that 330 population of 64 farm families and their average family size. Economically active male and female were four-times higher than economically passive members (66 members, i.e., 19%). Average family size was 5.12 members, almost size estimated by CBS (2011). Average male above 15 years (2.17) were slightly higher than female (1.98) while boys were also higher than girls (1.08).

**Table 43: Population and family size of insured farm head**

	>15-year male	>15-year female	<15-year boys	<15 year girls	Total	Economically active	Economically passive
Total family	139	127	38	26	330	266 (81%)	66 (19%)
Average family	2.17	1.98	1.46	1.08	5.12	2.08	1.27

Source: Field survey, 2021

**Occupation of the respondent, said farming as primary and secondary:** Table 44 depicts income earned by the farming-type entrepreneurs they insured. By enterprises, highest (59%) were adopting cash crops especially banana, coffee, cardamom crop. The income earned under that farming type was nearly 84 million in a year. The second most occupation was farming all crops including cereals, vegetables, fruit and so one, where 27% respondent earned 26 million. Earned income from cereals and occupation

rate were 1.8 million and 12.5%, respectively. Occupation by district shows the largest for Chitwan and occupied 71% in crop income share. By employed number in farming, study recorded 195 (59%) among 330 members and 58% of the total in cash crop farming, however, employed as primary occupation was (32%). Means that two-third of crop insurers were acting as secondary occupation to the crop farming enterprises, irrespective of those had attractive income.

**Table 44: Farming enterprises wise occupation and income earned**

District	Cereals	Cash crops	Mixed crops	All crop	Grand Total	Income from crop (million)
Chitwan	6.25	53.13		3.13	62.5	79.7 (71)
Makwanpur				4.69	4.69	3.1 (2.8)
Dhading				7.81	7.81	14.0 (12.5)
Kavre			1.56	10.94	12.5	8.8 (7.8)
Nuwakot	6.25	6.25			12.5	6.8 (6.07)
Grand Total	12.5	59.38	1.56	26.56	100	112.42 (100)
Income (mill.) by farming	1.8	83.9	0.7	25.98		
Total employed	28	113	2	52	195	
Employed as primary occupation	7	38	1	17	63	

Source: Field survey, 2021

Further analysis took place by counting their on-farm and off-farm engagement as they said crop farming was the secondary occupation. Including livestock, farmers engagement in on-farm choirs, income level is illustrated in Figure 8. Almost all respondents used farm income for payment of premium and said that income is enough for continuing income.



#### 4.5 SWOT analysis of crop insurance in the study area

Study has been included the strengths and weakness these are mentioned in four boxes

##### **Strengths**

- Insurance companies have office in the district and have staffs of management and administrative background;
- Have established collaboration among public-private-community partnership via crop insurance programme;
- Demand based insurance is running
- Well connected the crop insurance programme with the loan and subsidy provisioning programme;
- Smoothly run crop insurance Is seems effective in line-planted crops especially fruit trees and vegetables
- Local government particularly municipality and rural municipality have provision of 60:40 to 100% provision of complement insurance premium portion of the crop. insurers.

##### **Weakness**

- Except subsidy, low provisions to motivate small farmers into insurance programme;
- Inadequate extension service for crop insurance;
- Not acceptable loss estimation of technicians and indemnity payments of the insurers;
- Indifference of Agriculture technicians to visit field and prepare loss report on time;
- Unsimilar methods used in estimation of damage/losses;
- Crop insurers have to pay extra fees for loss report preparation;
- Undereducated agents and staffs in insurance office;
- Low applying product/value-based, and index-based insurance;
- Inadequate agriculture technicians employed, Offices too far and insufficient fiend monitoring of companies;
- Not the provision of target for doing crop insurance;
- Missing few important risk and uncertainty issues in the policy;
- More restrictions in insurance policies hindering farmers to be joined.

### Opportunity

- Rising number of non-life insurance companies (3 new since last year) for crop insurance business and establishing offices in the districts;
- Scope of establishing a Agriculture only insurance;
- Have continuity of 75% subsidy in premium charges of the Federal government;
- Establish provision of crop insurance in all MOALD and MoLMAC run programme;
- Rising income of business of non-life insurance companies;
- No of commercial banks are providing formal loan process in coordination with insurance companies.

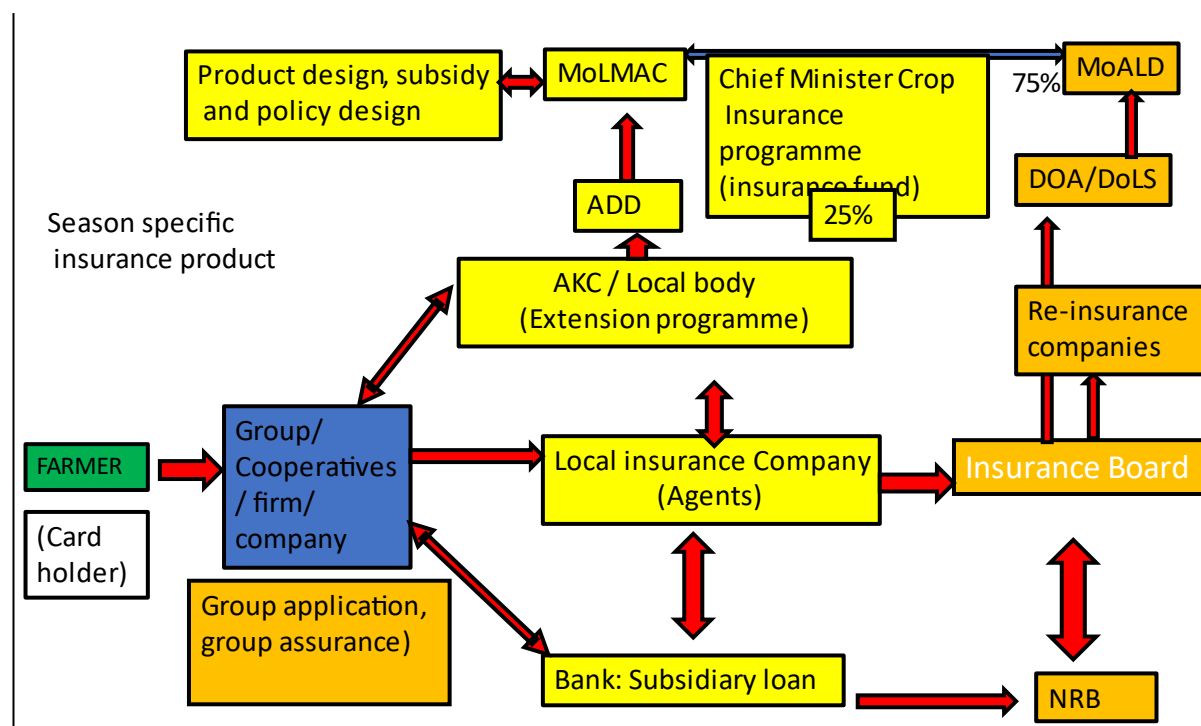
### Threats

- Unnecessary competition among the companies in making policy contract in low risk (high profitable) enterprises especially livestock and less priority in crop.
- Only large farm joining and enforced type;
- **Moral hazard:** Moral hazard of farmers, agent and insurance companies. All are harmful and could exploit both companies and crop insurers.

In order to weaken weakness and threats, study suggests short, medium and long-term strategies to be implemented for the improvisation of the insurance programme.

#### 4.6 Working modality of new insurance in Bagmati Province

Considering SWOT analysis of the insurance business and its marketing realities, perceptions of the crop insurer and discussions with KII, study felt a requirement of new mechanism in the province. Figure 10 illustrates proposed modality of crop insurance in Bagmati Province. This model has been built considering institutional mechanism of crop insurance within ADD and MoLMAC.



**Figure 10: Purposed modality of crop insurance in Bagmati Province**

“Kisan Card holding Farmers” will apply insurance company via group, agriculture cooperatives and firm or company as far as possible. Farms will be categorized into three-types based on insured sum (value based) and land size.

Group based approach supports reducing moral hazard one the one hand and increased bargaining power of the existing self-help groups/agriculture cooperatives. Required fund for additional investment will be akin from subsidiary loan provision of Nepal Rastra Bank (NRB). The existing Agriculture Development Directorate (ADD) could act as a technical hub of crop insurance for the coordination of AKC and agriculture wing of local bodies. Same office partly guides as policy designing platform for MoLMAC in regard of crop product, allocate subsidy and design investment. The crop insurance will be brought as a regular extension programme where Extension Officer at AKC and Agriculture Coordinator at local body implement programme. The office expert plan, organize, supervise training, awareness and

monitoring of crop insurance programme. A set-up will be established as “**Chief Minister Crop Insurance Fund (CMCIF)**” where provincial government, any donor can deposit money. ADD can establish a “**Crop Risk Assessment and Rapid Surveillance Think Tank unit**” which will act in:

- Prepare risk calendar, risk factors, link with climatic stations;
- Prepare climate stations as much as in major growth centres (at least super zones and zones)
- Risk analysis and broadcasting
- Indemnity payments based on weather index method

**Table 45: category of farming support of provincial support**

S.N	Category of farmers	Size of insured sum and land	Provincial topping (%) subsidy
1	Small holders/sub-commercial enterprises	Insured sum <5,00,000 or land < 1 ha land	75% from Federal and 25% from providential government
2	Medium land holders/commercial farming enterprises	Insured sum: 5 to-15 Lakh or land size 2-5 ha	75% from Federal and 10% from providential government
3	Large land holders /mega farming producers	Insured sum: >15 lakh or land 5 ha to 10 ha	75% from federal and 5% from providential government

Source: Researcher’s own theme, 2021

Any microinsurance programme under the province will also be launched under a door system. Both insurance agents and local insurance office prepare documents and collect premium charges from the cooperative/firm level-gate as far as possible. It definitely reduces transaction cost of the farmers and firm. The NRB, Insurance Board, DOA, MoLMAC, and MoALD will act as macro actors in policy provision and execution. This model is not new but slightly modified public-community- private partnership model and will be well institutionalize and sustainable. Any types of loss claims will be settled among group in the presence of AKC and local body and insurance staff and payments mode goes via same process but in faster way. Funding takes from the Insurance fund under Chief Minister Insurance programme.

## 5. Conclusion and policy recommendations

### 5.1 Conclusions

With using indicated methodologies, formulae and analysis. This study has been completed in as assigned time with the remarkable findings. The study collected information from 64 respondents, 37 key experts and few focus group discussions. The findings of the study are included in the executive summary section. Based on these findings, this study has drawn following conclusions:

- Market growth of crop insurance in terms of policy sell, insured sum, premium collection, government subsidy, re-imbursement of loss claims is encouraging in the programme districts.
- Almost head offices of the non-life insurances are situating in Bagmati Province, mostly in Kathmandu Valley and their branch offices are found in the almost Terai and hill districts but lower presence in Rasuwa, Dolakha and Ramechhap. Noteworthy to mention here that there is no specific Agriculture Insurance Company registered and acting in Nepal. Only those are non-agriculture dominance working on multiple peril products by mixed up of agriculture (crop, livestock, bird) and non-agriculture (motor, real state, travel, house, business, microinsurance). Among the companies, Shikhar Insurance, pioneering organization of weather index in apple insurance, is abruptly working not only in Bagmati province but also across 76 districts in Nepal. All companies and their incumbent staffs are poor oriented in crop technology, have employing inadequate crop technicians or mobilizing crop agents adequately. Their decisions have not meaningful worth in indemnity assessment and final payments.
- Even though Insurance Board has been brought insurance policies for many crops, study confirms further demands of missing sub-sectors such as nursery establishment, floriculture (flower farming, ornamental plants), crops grown under indigenous and organic farming and roof-top farming, which are very common in the districts of Bagmati Province.
- Insurance Board is not executing/monitoring properly in terms of crop insurance specific target assessment, district specific data management and policy updating and coordination with the district and central stakeholders.
- Study confirms disappointments of crop insurance in few issues: needs akin of land entitlement certificate of all land-type used in farming, delay in crop loss reporting, gap in crop loss assessment and indemnity payments in terms of figure and period. Delaying reimbursements of claim unnecessarily lengthy has raising dissatisfaction to the growers.

- Insurance programme was continuously going on. It is also enforced by the bank and subsidiary loan provision of Nepal Rastra Bank.
- Currently endorsed crop policies and risk coverage are inadequate for the farmers of Bagmati province;
- Crop insurance has been big-farmer oriented and enforcing it by bank loan and other crop-insurance -specific subsidiary program of the province and bank level. Big issue is attracting small farm holders into this risk transfer mechanism.
- Bringing small farmers into insurance programme, preparing guideline seems important
- Study confirms diversity in farming risks in the different crop production cluster of the districts. The blanket policy having same types of risk coverage, same instrumental charges, couldn't be the demand of new entrants in the crop production.
- Farm value of that season is the major decision matter in joining and continuing crop insurance. Other socioeconomic variables have partial to full effect in probability in decision making.
- Working modality for Bagmati province is imperative in order to build a model

## 5.2 Policy implications for modality of crop insurance for Bagmati province

Crop insurance products for the farmers of Bagmati are assumed more different than other provinces in Nepal. Currently launching crop insurance products are traditional and needs a lot of procedural preparations, which are disappointing loss facing farmers because of high transaction costs, inappropriate methods of loss estimation, prolonged indemnity claim process and tedious reimbursements. If it happens likewise, study expects worst scenario of crop insurance implementation. Making documentation process farmers friendly and increase their time in farming operations would be major motto of future modality. In order to promote crop insurance pro-farmer oriented, the government has been launching maximum efforts for the participation of the farmers into the insurance programme. Convincing the non-life insurance to be join into crop and livestock insurance, redemption of VAT (in crop) to the policyholder of agriculture insurance supporting to increase uptake. Few more efforts of involved organizations are suggested as per following stakeholders:

### **Suggestion to the Ministry of Agriculture and Livestock Development (MoALD)**

The MOALD did a lot of lobbying for executing crop and livestock insurance in Nepal. Agriculture Insurance is now cross-road and subsidy based. In this regards role of the MOALD is still crucial to execute provincial ministers, coordinate with donor agencies, Parliamentary Committee of Natural Resources, and Line-ministries especially Ministry of Finance (MoF). This study suggests to build a policy guideline by preparing crop insurance as mandatory to all regular farm development and food production programme, donor funded Programme as well as Prime Minister Modernization Projects (PMAMP). As far as possible group-based insurance approach would be less costly and have low

transaction cost, will be suggested to launch. It will encourage existing crop insurance companies to be mobilized in farm-based service delivery. The ministry also suggested to bring a policy that all card holder would involve in crop insurance work. Preparing diverse insurance products not only for large land-based but also value based insurance programme. Study suggests landholding-based and sum insure package as suggested in the working modality. The ministry could suggest Bima Samiti for updating CALD.

### **Provincial government: Ministry of Land Management, Agriculture and Cooperatives (MoLMAC)**

This ministry has three-year tenure in establishment and needs a lot of efforts to its institutionalizing with the like-minded organizations and programme. Providing additional subsidies for agriculture insurance in few years time would be instrumental to scale up farming and bringing motivation to the farmers. The policy makers under this ministry are suggested to prepare a separate modality of insurance so that crop insurance would be part of the farming operation of each farmer. Thus, few suggestions are:

- Prepare directives to the local government and AKC for any grant so that farmers group, agriculture cooperatives or firm compelled to join in crop insurance programme.
- Provide directives to existing Agriculture Knowledge Centre to make an arrangement as crop insurance as part of the extension programme.
- Directives to prepare an insurance service to prepare it as easy process of buying insurance, claim process easier and faster.
- To encourage farmers, cooperatives and entrepreneurs, study suggests making directives for rural/municipalities to pay 100% of farmer's premium to encourage small holders, poor, disadvantage families.
- Beema samite has been bringing weather index insurance for apple farm. It has been applying in Jumla and Karnali province. Similar climates found in Dolakha, Rasuwa, Ramechhap, Sindhupalchowk district this policy can be launched especially in temperate fruits with the establishment of weather stations in the production hamlets. In this regard, it's our humble request to **MoLMAC to establish sufficient weather stations in the hill and mountain districts so that** weather index insurance product can be launched in the Bagmati Province.
- The MOLMAC is suggested to direct ADD and AKC to start faster technology (smart phone and remote sensing) in Bagmati province to capture and upload the data of crop cutting to reduce the delays in claim payments to the farmers. Since indemnity receiving was reported about will be encouraged to a great extent. Smart phones will be used to capture and upload data of crop cutting

to reduce the delays in claim payment to farmers. Remote sensing will be used to reduce the number of crop-cutting experiments.

### **Suggestions related to Agriculture Development Directorate, Hetauda and Agriculture Knowledge Center**

Existing system is not attached to connecting provincial programme not connected in crop and livestock insurance. This study suggests to bring Crop Insurance Focal Person as part of the Extension Programme of the Provincial programme. This system will support keeping database in the CDD, execute ministerial level subsidies and monitoring of the insurance companies works.

While implementing current crop insurance policies, technical part is most importantly included especially in variety selection, authentic seed/sapling sources, virus free testing, line planting and other intercultural operations. In excising extension support system, individual farmers could not get field-based coaching from the service of extension services. ADS has highlighted Community Livestock and Agriculture Service Center model as the adoption of Go together extension programme and crop insurance will be most effective programme so that there will be fulfilled technical specifications and skill transfer even for inactive growers. This study suggests it strongly in the sense of making it as most appropriate modality in the Bagmati province.

**Organise orientation training and follow-up in crop insurance:** In all short-to long day training to be organized under ADD and AKC, the any organizer is suggested to include crop insurance training to the insurers and non-insuring farmers and taking human resource sharing from local insurance office.

As suggested in the new modality, ADD is strongly suggested to establish a “**Crop Risk Assessment and Rapid Surveillance Think Tank Unit**” in order to support technical capacity of the province in risk assessment, indemnity payments, forecasting and broadcasting to the province farmers.

### **Suggestions to the Insurance Board**

This study suggests partly revise currently bringing Crop and Livestock Directives:

- **Bring policy for indigenous crop farming:** “Existing policy said that any seed to be brought from authorized sources. It has hampering those farmers to be joined as part of insurance programme. Study strongly suggests to prepare: “Insurance Policy Indigenous and organic farming policy” to encourage farmers as well as model farms who are running permaculture and organic farming



- **Endorse policy for Nursery and Nursery Management:** multipurpose nursery establishment (vegetables, fruits, flowers and: This business is rising as most lucrative business in the city area, especially in Bagmati Province. This study suggests to revise it and incorporate it and prepare: “Nursery Insurance policy”
- **Provisions of diversified insurance schemes:** Like weather-based index for apple, bring diversified insurance schemes as per demand of growers for potential risks and uncertainty such as monkey damage, wild boar, Himalayan Porcupine, birds, theft, disease, hailstone which are peril to hill and mountain districts. Last year brought Covid-19 specific policy was effective in human case, but it was not included for farming case. Rather than making a blanket policy of covering all risk coverage, this study strongly suggests Crop-hail/thunder, wild-life peril, theft-peril, crop marketing insurance to the middle man, crop revenue insurance or multiple-peril-crop insurance products by specifying certain changes and conditions. This provisioning will address all coverage of dissatisfies of the crop insurer. Study strongly suggests bringing annuity -insurance programme (as implemented in human life insurance programme) to long-gestation crops such as fruit, cash crops (cardamom, coffee, tea, nursery) so that every farmer adopt it as payment of premium as a regular process of insurance.
- **Appropriate Product Designs:** Both Insurance Board and companies are suggested to expand agriculture insurance market as service driven rather than abrupt profit-making business. Bringing the package: motor with crop insurance package, crop and livestock together, or whole integrated farm together. Doing integrated farm definitely encourage those farmers having concept of working in it. Appropriate product designs based on the needs of the low-income market segment will help insurance companies expand their market. In different countries, crop/microinsurance products have been bundled with other financial and non-financial products to increase uptake of insurance. Insurance companies should explore different other alternatives and develop appropriate crop, livestock products to address clients’ needs. Demand-driven processes to develop new products will help increase uptake of insurance.
- **Implement value-based insurance system:** In order to focus aim of the entrepreneurs and their profitability via business. Beema Samiti is requested to approach/sell value-based crop policies and transparent crop loss valuation system, and its fast payments. Although, high cost of premium charges, losses claims can cover value at least in farm gate level. It is our expectation that it will satisfy the farmers rather than cost-based system.
- **Amend “Crop and Livestock Directives 2077”:** Study observed some moral hazard issues in multi-harvest crops:

In order to advance crop insurance in Nepal, different stakeholders need to work together and make products accessible to low-income and rural households. Some of the actions to be taken to promote crop insurance are as follows:

**Harmonize microinsurance and crop insurance:** It seems that the insurance companies are offering different insurance products to low-income households, but they are not formally defined as microinsurance products. Similarly, there is confusion about why certain agriculture insurance products do not fall under the microinsurance category, even though they fulfil the requirements. Beema Samiti and the insurance industry should collectively review current implementation of crop insurance policies and microinsurance policies in the field. In addition, Beema Samiti should also explore the pros and cons of revising maximum sum assured crop insurance products. Stakeholders of insurance have raised issue with banking process reservation requirements.

**Lengthen the insurance period:** Farmers using hybrid varieties can grow longer than indicated in the policy. So, all policies need to be revised and include post-harvest period also.

**Record keeping and monitor the insurance companies:** Since study requested timeseries data of Bagmati province but provided company-wise data set. The data presented in the. As district office said insufficient monitoring of the district office works. The Crop and Livestock Directives” is not properly implemented in the field especially in payment issues.

**Suggest insurance office to employ crop technicians:** Existing companies had launching crop insurance with insufficient agriculture technical staffs.

### **Suggestions to insurance companies**

**Mobilize staffs at least B.Sc. (Ag) background:** Even most of the insurance staffs have very low to no staffs of Deploma Backgorund. They have no idea of estimating real cost, loss assessment and inferior decision power than that graduated one. In this staffs, all insurance companies are suggested to employ officer level staffs and supportive staffs so that increased insurance programme by the provincial government will be tapped-up and well mobilized.

Study suggests **not to centralize crop insurance authorization** and payments of indemnity since district offices are acting as mediators.

**Mobilize staffs rather than working through agent:** Existing trained agents are charging more money with the clints especially insurance document preparation (CoP, value-based document preparation). If staffs would be mobilized, that part

**Catch-up start-up agro-entrepreneurs at early:** All insurance companies are suggested to bring start-up agro-enterprises into a long-term insurance process in order to attract low loss type farming.

**Update the cost of production:** Make calculation as smart as new cost approach the farmers use. Since salary, administrative cost, tax, interest charges are not included in the cost items, these to be included in the new cost items.

### **Suggestions to the growers and suppliers**

- All farmers, who are doing insurance are strongly suggested to continue crop insurance, with realizing the premium value as risk transfer not think it as loss of money.
- All farmers are requested to purchase value-based insurance policy under group approach. Before purchasing any type, all to be akin on process of implementation approach.

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## APPENDICES

### Appendix 1: (a) Team mobilized for the completion of the study

S.N.	Name	Qualification	Working man days	Responsibilities
1	Thaneshwar Bhandari	Completed M.Sc (Ag) in Agriculture Economics and MA in Rural Development	45	Team Leader for overall survey and reporting
2	Deepak Raj Joshi	Completed B.Sc (Ag) and studying M.Sc (Ag) 2 <sup>nd</sup> sem IAAS-TU	30	Research Assistant for enumerator and support hand of team leader for draft report preparation and facilitation and Enumerator (for Makawanpur, Kavre, Sindhupalchowk and Dhading)
3	Gaurav Neupane	„	15	Enumerator (for Makawanpur, Kavre, Sindhupalchowk)
4	Nabin Kunwar	Completed B.Sc (Ag) and studying M.Sc (Ag)	15	Enumerator (for Chitwan and Nuwakot)
5	Sudip Marasini	Completed B.Sc (Ag) and studying M.Sc (Ag)	15	„

### Appendix1: (b) Sub-committee involvement in discussion and finalization of the study

S.N	Name	Qualificati on	Working man days	Responsibilities
1	Dr Devendra Gauchan	PhD	5	Coordinator, General Secretary of NAES
2	Ram Prasad Pulami	M.Sc (Ag)	5	Member, Vice-chairman of NAES
3	Thaneshwar Bandari	M.Sc (Ag) & MA		Overaall implementation and prepare final report to submit it
3	Diwas Raj Bisata	M.Sc (Ag)	5	Member, Vice-chairman of NAES
4	Padma Pokharel	M.Sc (Ag)	3	Member, Member of NAES
5	Shrijana Timilsina	M.Sc. (Ag)	7	Member, Treasure of NAES

## Appendix2: Structured pretexted questionnaire used for household survey

बागमति प्रदेशमा बाली विमाको प्रभावकारिता अध्ययन सर्वेक्षण प्रश्नावली २०७७

नमस्कार ! मेरो नाम ..... हो । हामी कृषि विकास निर्देशनालय, हेटौडाको लागि यो सर्वेक्षण गरिरहेका छौं । सकभर घरमूली वा यस कार्यक्रममा सहभागी व्यक्तिले यी प्रश्नहरूको जवाफ दिन आग्रह गर्दछु । यो सर्वेक्षणले कार्यक्रमका क्रियाकलापहरूको योजना तर्जुमा र अनुगमनको प्रभाव हेर्न मद्दत गर्नेछ । यस सर्वेक्षणमा तपाईंको सहभागिता स्वैच्छिक छ । तपाईंको सबै जवाफहरू गोप्य राखिनेछन् ।

घरघुरी संकेत नं

अन्तरवार्ताकारको नाम:..... हस्ताक्षर

सुपरिवेक्षकको नाम :.....

1.1 Full Name of policy holder:

Contact number:

1.2 Address:

1.3 Gender:

1.4 Ethnic caste:

1.5 Age (in years):

1.6 Education level of policy holder: Literate / illiterate

If “literate”, mention no of years of education.

1.7 Experience in crop cultivation (no. of years)

1.8 Membership in any self-help group/cooperatives (specify):

1.9 Training in crop insurance (if any): Yes/no

1.9.1. If yes, name of theme.....1.9.2 Duration :..... days

1.10 Family size: .....No

Adult (above 14)			Children		
Male		Female	Male	Female	Total
Total					

1.11 Working member wise occupation (staying at home and outside)

Name of occupation	Type*	No of family	Annual income (NRs)
1.Crop farming (production * farm get price)			
2 Livestock production (milk, ghee, fish, honey, live animals etc)			
3. Agribusiness (fresh house, vegetable shop, milling, services, etc)			
4.Non-farm business (retail shop, wholesale, occupational, sale/services)			
5. Service (Regular/part-time Service in gov, NGO, private, school)			
6. Foreign job (India, abroad)			
7. Pension and other Samajik Surakhya Bhatta, etc			
Total			

\* primary or secondary

1.12 For how many weeks in total have you able to engage in crop cultivation in a year

i) On farm- Own farm: .....ii) Other's farm..... iii) Off-farm: .....  
1.13 Land holding (ha/ropani/ana)

Type of land	Irrigated	Non-irrigated	Total
Cultivated owned			
Uncultivated owned			
Leased in			
Leased out			

## 2. Insurance purchase

2.1 For crop insurance, can you name the insurance company that you bought policy contract?

.....

2.2 In case changed number of crop insurance companies, please say number .....

2.3 For insurance purpose, have you gone insurance office or staffs came in your location? .....

2.4 Which agent you chose? (1: company staff, 2= AKC agent, 3=Livestock agent)

Latest Agent name (if possible) ..... address with code.....

2.5 Please mention the location of nearest insurance office and time required to reach the person

Location: -. ....

Time takes to reach the location: -

2.6 Please tick on insurance policy that you made contract in recent time.

crop	Name of	Sub-	Sub-	Type	Area	Yr	Types
		sector	sector	of farming*	of farming	of experience	of policy **
			Variety				
	Vegetable						
	Fruit						
	Main						
season	paddy						
	Cash crop						
	Other.....						
	Other.....						

2.7 Can you please share continuity in crop insurance contract?

Indicators	070/71	071/72	072/73	073/74	074/75	075/76	076/77	077/78	otal
Crop name									
Area									
Duration									
Sum insured									
(Rs)									
Premium									
paid(Rs)									
Gov subsidy									
value (Rs)									
Actual yield									
(Kg)									
Normal yield									
(Kg)									

Crop loss amount (Kg*Rs) claim									
Cause of crop loss *									
Date of crop loss									
Full/partial loss claim									
Date of compensation claim									
Period of claim apply to receive									
Indemnity received (NRs)									
Date of receipt									

2.8 Have you spent the planned costs/input in crop production/marketing as per policy?

☐ spent around > 100 % ☐ spent 75- 100% ☐ spent 50-75% ☐ spent <50%

2.9 What types of insurance contract you made? ☐ Individual ☐ Group

2.10 If group based, name the types of group

☐ Farmer's group ☐ agri-cooperative ☐ other .....

2.11 What is the source of premium amount you paid?

☐ Farm income ☐ non-farm income ☐ borrowed money

2.12 For what types of farming purpose, you insured crop type

☐ Tunnel/open ☐ Commercial ☐ semi-commercial

2.13 Is insurance policy covered the almost risk mentioned below g crop cycle period?

Types of risk/uncertainty	Insect pest	Disease pest	Thunder/hail	Wind speed	Landslide	Flood damage	Wild life damage	Theft	Others
Y/N									

2.14 Please mention additional crop areas and production more than insured crops/enterprises?

Crop	Name of area	Season	Output	Rs/kg	Source of irrigation
Crop 1:					
Crop 2:					
Crop 3:					
Crop 4:					
Crop 5:					

Code for crop: 1 paddy, 2. maize 3. wheat, 4. Vegetables 5= fruits 6 ginger/turmeric, 7. Pulses.  
8=other



Source of irrigation: 1. Tube/dug-well, 2 Tank/tap water, 3 Canal/water route, 4. spring, 5 residual water (purchased water).

2.15. What is your self-food security condition?

a) < 3-month                      b) 3-6month                      c) 6-9                      d) 9-12month                      e) >surplus and sell

2.16 Do you spend more money than planned in the insurance policy? Y/N

2.17 If yes, why did you spent more amount than that planned in the insurance policy contract?

☐ Increase cost abruptly than planned                      ☐ Higher price than that planned  
☐ Any endemic: fall army worm / locust ☐ pandemic lockdown ☐ Other local conditions

2.18 Have you forced to do crop insurance for taking loan/other programme obligations? Y/N

2.19 If yes, what is the major forced factor of doing crop insurance?

☐ Take loan                      ☐ Cooperative loan                      ☐ Programme requirement  
☐ AKC requirement                      ☐ Donor                      ☐ other

2.20 If it is compulsory based insurance type, which office influenced /forced you buying insurance contract? Please name of the program.

.....

.....

2.21 What are the risk/uncertainty factors that you faced in growing crop than that above explained?

Rank	Risk	Rank	Risk	Rank	Risk
	a. drought		f. Decline in crop price		k. Fire/forest fire
	b. Rainfall related (less/high/varying rate)		g. failure of new technology		l. Wind, hailstone and thunder damage
	c. Insect pest loss		h. wild life damage		M. Dew/frost
	d. Disease loss		i. human theft		N. Environmental fog
	e. Covid-19 lockdown		j. Earthquake		

Rank it:

1. 1<sup>st</sup> most losing 2 . important losing 3. Moderate losing 4 fairly losing 5 not important

**2.22 Evaluation of risk:** In terms of their potential to affect your farm income, how would you rate the following source of risk (circle the number which best presents your answer)

Risk source	Potential effect				
	High		Low		
A. Variability in crop yield					
B. Variability in farm price					
C. Change in input costs (seed, pesticides)					

D. Change in government farm programs					
E. Change in government subsidy programs					
F. Change in type of land rent					

2.23 Do you believe that doing crop insurance could solve the above losses? Y/N/Partially

2.24 Have you done any other insurance till the date for any indemnity you face? Yes /No

2.25 If yes, please answer types of other insurance done and continuing ☐ CheckBox1

Types of insurance	Sum insured	Paid Amt of premium (NRs)	Mode of payment *	Claim any losses
a. Life insurance				
b. Livestock /poultry insurance				
c. House/barn insurance				
d Other insurance: pandemic				

A. Mode of payment: 1. Annual, 2. Semiannual, 3. Biannual, 4. Monthly

### **3.Claim paid and compensation receive related questions**

3.1 Have you faced any problem in receiving compensation in case of partial/complete crop loss?

☐ Not yet claimed ☐ Yes faced losses and planning to apply ☐ just applied  
☐ Indemnity received with durable hassles ☐ Not faced any problem

3.2 Among indicated option, for whom you first reported /informed the crop damage?

☐ Agent of AKC ☐ Agent of livestock KC ☐ Agent of insurance company ☐ staff of insurance company

3.3 Among indicated option, when did you inform your crop loss/damage?

☐ As soon as seen ☐ Within a week ☐ within the fortnight ☐ within 35day ☐ > 35 days late

3.4 How many days later you submit crop loss reports to the agent /company

☐ Within 15 days ☐ Within 35 days ☐ within 2 months ☐ within 6 months ☐ .....

3.5 If faced problem in claim report preparation, please mention types of hurdles you faced?

☐ Technical report preparation from AKC ☐ Unresponsive crop technician (of AKC) ☐ Delaying response of agent  
☐ Unrecommended variety use ☐ Unrecommended technologies use ☐ Delay in visit of technicians and agents ☐ Insurance office far from residence

### **4.Perceptions of policy-holders**

4.1 Which factors motivated your family for buying crop insurance?

☐ Financial/programme requirement meet ☐ subsidized premium amount  
☐ As protection against risk/uncertainty ☐ Any other (Group/neighbor factor)

4.2 If it is voluntary, what factors supported you buying insurance contract?

☐ Self-realization of loss cover ☐ Feeling uncertainty/risk factors  
☐ Agent of insurance company ☐ Training received from organization  
☐ Mass media /news ☐ AKC/insurance company

4.3 What do you think about state-subsidy-base insurance scheme?

- ☐ Strongly like                      ☐ Like it                      ☐ Moderately like  
☐ Moderately dislike              ☐ Dislike                      ☐ Strongly dislike

4.4 Is the premium rate affordable to you?    i) No                      ii) partially                      iii) Yes

4.5 Do you realized that paid premium amount transferring your risk from you to company?

- ☐ No                                      ☐ partially feel                      ☐ Yes

4.6 In case you are doing individual insurance, do you aware of 15% less premium of group-base insurance policy?

- ☐ Not idea      ☐ Partially but not followed      ☐ Yes but not follow      ☐ Yes & follow

4.7 Do you aware on all risk cover, uncover and partial to full insurance claim process?

- ☐ no idea      ☐ partially have      ☐ moderately have      ☐ completely have

4.8 Rank your satisfaction level in risk cover and uncover points indicated in that specific crop policy?

- ☐ Strongly dissatisfied                      ☐ Dis-satisfied      ☐ Neutral: Neither satisfied not dissatisfied  
☐ Satisfied                                      ☐ Strongly satisfied

#### 4.9 What uncover conditions in policy are unacceptable to your condition?

<input type="checkbox"/> Carelessness or purpose of enjoyment of family members	<input type="checkbox"/> Zealousness or revelry behavior	<input type="checkbox"/> 3. Loss by order of government or authorized person or agency	<input type="checkbox"/> 4. Stolen / theft	<input type="checkbox"/> 5. Sale	<input type="checkbox"/> War, foreign attract, civil war or insurgency
<input type="checkbox"/> 7. Revolution, army coupe	<input type="checkbox"/> 8. Radiation and Nuclear effect	<input type="checkbox"/> 9. Misrepresentation, concealed and hiding the information	<input type="checkbox"/> 10. Use for different purpose	<input type="checkbox"/> 11. Excess than capacity of pond	<input type="checkbox"/> 12. Change of water or cleaning of pond

#### **5. Effectiveness Analysis**

5.1 Without and with insurance it, please mention your feeling in following key differences in cultivation and your income

Without insurance	with insurance
<input type="checkbox"/> Decrease investment confidence	<input type="checkbox"/> Increase investment confidence in agriculture
<input type="checkbox"/> Uncovered the losses	<input type="checkbox"/> Covered losses broaden uncovered part
<input type="checkbox"/> No idea of scientific farming	<input type="checkbox"/> Learnt scientific farming
<input type="checkbox"/> No payment made for premium	<input type="checkbox"/> Paid regularly insurance premium
<input type="checkbox"/> Not coordination with crop technician	<input type="checkbox"/> coordination with crop technician
<input type="checkbox"/> Not increased yield and income	<input type="checkbox"/> Increase yield and income
<input type="checkbox"/> No government insurance support	<input type="checkbox"/> With government and insurance company support

5.2 Without and with crop insurance decision, please mention following key differences (in value) while cultivation and getting final income

Key variables	Without crop insurance	With crop insurance
Transfer farming risk (%)		
Change in seed and technology cost (% or value)		
Change in labor cost (% or value)		
Change in capital cost (% or value)		
Change in communication, travel and logistic management cost (% or value)		
Change in yield (%)		
Change in income stabilization (%)		

5.3 Do you ensure crop insurance continuity from now? ☐ Yes ☐ thinking ☐ No (If NO. go Q.N.5.8)

5.4 If yes, what are your points of willingness to continue crop insurance?

- |   |  |
|---|--|
| <input type="checkbox"/> Exploit and use state-subsidy upto 75% | <input type="checkbox"/> Habitual on documenting and claim process |
| <input type="checkbox"/> Complement scientific farming          | <input type="checkbox"/> Facilitate compulsory insurance program   |
| <input type="checkbox"/> Assure farm yield and income           | <input type="checkbox"/> Continue commercial farming               |

5.5 Have you satisfied with the final revenue defined by insurance company (yield variation method but not price variation of measuring insured value)?

Strongly dissatisfied (1) |-----| Strongly satisfied (5)

5.6 Will you continue crop insurance even removal of state-subsidy in insurance premium?

- ☐ Discontinue crop insurance    ☐ Discontinue even after compulsory insurance finish  
☐ Needs revising policy to continue    ☐ Yes, continue

5.7 If continue without preconditions, what is the maximum premium you are willing to pay?

- ☐ Percentage of sum assured (A)    Code: 1. >2%, 2. 2-3%, 3. 3-4%, 4. 4-5%, 5. >5%

5.8 If not continue insurance, rank the causes of importance

(1= less important, 5 High important)

Causes	1	2	3	4	5
<input type="checkbox"/> Too expensive premium					
<input type="checkbox"/> No need, cause of discontinue farming					
<input type="checkbox"/> Not cash /credit to pay the premium					
<input type="checkbox"/> Not sufficient land (leased land) available for insurance					
<input type="checkbox"/> Bought insurance last year but not satisfied					
<input type="checkbox"/> Don't understand the insurance product					
<input type="checkbox"/> Compulsory program phased-out					
<input type="checkbox"/> Not trust of insurance agencies and technical staff					
<input type="checkbox"/> Unfeasible due to uncovered part dominant					
<input type="checkbox"/> Got problem in claiming full/partial losses					
<input type="checkbox"/> Far from insurance office					
<input type="checkbox"/> Other causes					

5.9 What could be the suggestions for improving crop policy and upgrading service of insurance company as well as agent.

a) .....

b) .....

c) .....

d) .....

**Appendix 3: a)List of key experts consulted for the study**

S.N	Name	Organization	Position	Mode of survey	Date of contact
1	Poonam Gnawali	Bima Samitee	Coordinator, Agriculture	In-Person	16-08-2077
2	Kundan Sapkota	Bima Samitee	Assistant Director	In-Person	16-08-2077
3	Shyam Sundar Ghimire	DOA Hariharbhawan	Senior Extension Officer	In-Person	29-08-2077
4	Krishna Bhadra Adhikari	AKC Lalitpur	Office Chief	In phone	13-01-2078
5	Yogendra Singh	ADB, Ramsahapath	Chief, Loan and microinsurance	In phone	14-08-2077
6	Sudeep Dahal	ADB, Ramsahapath	Chief, Loan section	In phone	15-08-2077
7	Santosh Pant	Premier ICL	Manager , Crop insurance	Inperson	03-11-2077
8	Sarthak Raj Pandey	Shikhar Insurance, Kathmandu	Coordinator, Crop insurance	In-Person	02-11-2077
9	Arjun Dev Acharya	Shikhar Insurance, Chitwan	Coordinator, Crop insurance	In-Person	07-01-2078
10	Chandramani Sharma	Shikhar Insurance, Chitwan	Manager , Crop insurance	In-Person	07-01-2078
11	Ishwor Adhikari	Shikhar Insurance, Chitwan	Technician, Crop insurance	In-Person	08-01-2078
12	Pramod Pokharel	Shikhar Insurance, Hetauda	Manager , Crop insurance	In-Person	08-01-2078
13	Ganesh Thapa	Prudential Insurance, Hetauda	Manager , Crop insurance	In-Person	08-01-2078
14	Chandranath Upreti	Nepal Insurance Company Ltd	Manager , Crop insurance	Inperson	03-11-2077
15	Gita Pyakurel	Prudential Insurance, Kathmandu	Coordinator , Crop insurance	In-Phone	08-01-2078
16	Sitaram Aryal	Shikhar Insurance, Dhading	Manager , Crop insurance	In-Person	09-01-2078
17	Raj kumar Ale	Shikhar Insurance, Dhading	Technician	In-Person	09-01-2078
18	Rajib Pokharel	IME General Insurance, Dhading	Branch-Incharge	In-Person	09-01-2078
19	Jhalak Kandel	Agriculture Knowledge Centre, Dhading	Head of Office	In-Person	09-01-2078
20	Kamal Raj Sharma	Agriculture Knowledge Centre, Dhading	Extension	In-Person	10-01-2078
21	Santosh Chaudhary	MPAMP, Dhading	Officer	In-Person	10-01-2078
22	Dr KR Gairhe	MPAMP, Dhading	Head of Office	In-Person	10-01-2078
23	Tej Pd Dawadi	AKC, Kavrepalanchowk	Head of Office	In-Person	12-01-2078

24	Umesh Pradhan	Himalayan General Insurance Cm Ltd, Banepa	Kathmandu	In-Person	08-01-2077
25	Umesh Pradhan	Himalayan General Insurance Cm Ltd, Banepa	Head of Office	In-Person	12-01-2078
26	Rameshwor Shrestha	AKC, Kavrepalanchowk	Ex-focal person, Agent	In-Person	12-01-2078
27	Nirajan Shrestha	Agri-entrepreneurship	Agent	In-Phone	12-01-2078
28	Madhusudhan Poudel	AKC, Kavrepalanchowk	Agri-Extension Officer	Inperson	12-01-2078
29	Pujan Jangam	AKC, Kavrepalanchowk	Agri-Extension Officer	Inperson	12-01-2078
30	Tharka GC	AKC, Kavrepalanchowk	Crop Dev Officer	Inperson	12-01-2078
31	Umesh Sapkota	AKC, Kavrepalanchowk	Crop Dev Officer	Inperson	12-01-2078
32	Surendra Rai	Shikhar Insurance, Nuwakot	Head of Office	In-Person	13-01-2078
33	Maheshwor Bhurtel	Shikhar Insurance, Nuwakot	Technican	In-Person	13-01-2078
34	Keshab Khanal	Agriculture Knowledge Centre, Nuwakot	Head of Office	In-Person	13-01-2078
35	Rukmini Adhikari	AKC, Nuwakot	Extension Officer	In-Person and telephone	13-01-2078
36	Nabin Subedi	Siddartha Insurance Kathmandu	Agriculture Officer	In phone	07-12-2077
37	Motilal Yadav	Primier ICL Sindhuli	Technical Officer	Telephone	12-01-2078

### **Appendix: 3 b) Checklist for key expert survey: Insurance company and agent**

Name of the insurance company:

Name of person interviewed/provided data:

Agent No (if has)

Address:

No of branches:

# of agents involved in crop insurance:

#### **1. Insurance service related**

Current number of policy holders in particular district and province:

District	# of policy holders /contract sold	Male policy holder	Female policy holders	By ethnicity	By crop
Chitwan					
Makwanpur					
Dhading					
Nuwakot					
Lalitpur					
Bhaktapur					
Kathmandu					
Rasuwa					
Sindupalchowk					
Sindhuli					
Ramechhap					
Dolakha					

2. Policy holder's economic status: poor, medium and rich

3. How many contracts sold upto this period?.....

4. Trend of contract sold since 2070 B.S: .....

5. Contract sold based on types of crops /enterprises policy sold:

6. Level of agri-business of policy holders:

7. In crop insurance business, what is the annual premium collection of your organization from farmers and respective government subsidy

8. Any other fund/incentive you receive as donation for crop insurance mobilization?

9. Process of institutionalize insurance



10.What the qualification and experience of agent /surveyor needed?

11.Are all agents/surveyor trained in crop insurance?

12.How many crop policies sold per agent?

13.How much is the incentives to the agents? .....How much they earn each month at least?

14.Are all agent /surveyor expert in policy sell, damage estimation and dispute settlement?

15.Any Broker involved further buying and selling insurance contract?

16.Are you use crop insurance sum into capital market (share market) for income generation?

17.What is re-insurance process?

**18.Claim paid situation**

18.1No of claims received mostly based on crop and types of uncertainty you paid mostly

Name of enterprises	
Risk/uncertainty claimed	

18.2.Visit response as soon as claim issues: week/fortnight / month

18.3Policy-holder's problems while claiming:

18.4Types of moral hazard that your company paid mostly:

18.5 the claim issue, processed and paid duration:

**19. Problem/challenges**

19.1General problems you face in selling contract

19.2What types of moral behavior you found while buying and selling insurance contract?

Policy holders (Farmers side) constraints	Donor side (Government side) constraints

(Discuss, location, moral hazard, fraud, valuation difficulties, unavailability of location-based data, weather based information, access and awareness)

Have you organized awareness raising programme /workshop in order to sell crop insurance service?

19.3 Have you cancelled any policy contract or refund someone because of fraud in information?

## 20. Commission

Are you satisfied with the charges /commission fixed my agriculture and livestock insurance directive 2077? Reduced 5% from 15% that was fixed earlier.

## 21Coordination

21.1Are there any leading insurance companies are you coordinating for solving insurance disputes or discuss directly with the Insurance Board?

21.2. How many offices are you connecting for accomplishing insurance

21.3 What do you manage disputes when it goes to Insurance board level?

21.4. Number and amount of payment delays due to unsolved disputes?.....

21.5 Why do farmers discontinue crop insurance?

22. Please rank attractiveness matrix of crop insurance

<b>Potential to transfer risk and promote crop business</b>				
	<b>Hig</b>			<b>Attractive:</b>
	<b>Medium</b>		Medium attractive:	
	<b>Low</b>	<b>Not attractive:</b>		

		Low	Medium	High
<b>Potential to regularize /purchase crop policy</b>				

22.2 Is it growing business? what do you think in it?

22.3 Do your organization continue crop insurance service even after withdraw gov-subsidy?

22.4 Suggest effectiveness and sustainability of crop insurance in Bagmati province.

.....

.....

Thank you

### Appendix 3: c) Checklist for AKC officer/ focal person

Name of AKC staff/head:

Name of person interviewed/provided data:

Agent No (if has) :

Address:

Name of focal person:

# of agriculture staffs acting as agent in crop insurance:

Trend of contract sold since 2070 B.S: .....

Policy sold based on types of crops /enterprises:

Farming level of agri-business of policy holders:

What would be the crop insurance-based subsidy invested in the district?

Any other fund/incentive you receive as donation for crop insurance mobilization?

Process of institutionalize crop insurance/ is it same for livestock insurance?

What the qualification and experience of agent /surveyor needed?

Are all agents/surveyor trained in crop insurance?

How many crop policies sold per agent?

How much is the incentives to the agents? .....How much they earn each month at least?

Is focal person involve in damage/crop loss estimation and dispute settlement? If yes, duration in a year you invest.

No of claims received mostly based on crop and types of uncertainty faced.

Name of enterprises	
Risk/uncertainty claimed	

Policy-holder's problems while claiming:

Types of moral hazard during complete/partial loss the farmers claim mostly:

The claim issue, processed and paid duration:

**Problem/challenges**

General problems you face in loss estimation / dispute settlement

What types of moral behavior you found while buying and selling contract?

Policy holders (Farmers side) constraints	Donor side (Government side) constraints	Insurance company side

(Discuss, location, moral hazard, fraud, valuation difficulties, unavailability of location-based data, weather-base information, access and awareness)

Have you organized awareness raising programme /workshop in order to motivate farmers in crop insurance service?

### **Commission**

Are you satisfied with the charges/commission fixed my agriculture and livestock insurance directive 2077? Reduced 5% from 15% that was fixed earlier.

### **Coordination**

Is AKC/past- DADO office involve dispute settlement when it goes to Insurance board level?

Number and amount of payment delays due to unsolved disputes?.....

Why do farmers discontinue crop insurance?

Is purchasing/buying insurance business? what do you think in it?

Do your organization continue crop insurance service even after withdraw gov-subsidy?

Suggest effectiveness and sustainability of crop insurance in Bagmati province.

.....  
.....

Thank you

**Appendix 4: Status of crop and livestock insurance status in Bagmati Province**

S.N.	Name of Company	Sum Insured	Premium	Subsidy	No. of Policy
1	Nepal ICL	15,71,77,058.00	60,36,402.00	45,27,301.50	239.00
2	The Oriental ICL	31,50,88,697.39	1,52,67,216.84	1,14,50,412.63	857.00
3	National ICL.	-	-	-	-
4	Himalayan General ICL	36,38,18,895.00	1,76,74,704.00	1,32,56,028.00	2,571.00
5	Premier ICL	10,91,69,740.00	54,12,487.00	40,59,365.25	963.00
6	Neco ICL	41,40,85,811.85	1,84,70,912.50	1,38,53,184.38	228.00
7	Sagarmatha ICL				
8	Prabhu ICL	1,69,23,500.00	8,28,107.81	6,21,080.86	104.00
9	Shikhar ICL	1,57,24,07,956.08	7,49,10,824.94	5,60,90,950.55	5,525.00
10	Lumbini General ICL	5,78,13,000.00	28,90,650.00	21,67,988.00	1,168.00
11	Prudential ICL				
12	NLG ICL	1,20,20,29,533.00	5,96,84,656.20	4,47,63,492.13	9,315.00
13	Siddhartha ICL				
14	United ICL	44,56,65,834.00	2,21,05,479.40	1,65,79,109.55	2,697.00
15	Everest ICL	6,33,91,350.40	31,69,567.52	23,77,175.64	93.00
16	Rastriya Beema CL				
17	IME General ICL	75,41,00,580.67	3,53,39,725.51	2,65,04,794.13	2,898.00
18	Sanima General ICL	8,02,15,000.00	40,10,750.00	30,08,062.50	86.00
19	General ICL	47,04,810.00	35,00,655.00	10,42,81,800.00	344.00
20	Ajod ICL				
	TOTAL	5,55,65,91,766.39	26,93,02,138.72	30,35,40,745.12	27,088.00

Source: Insurance Board, 2021 (data of Shrawan -Poush 2077-78)

#### Appendix 5: Time required to reach crop insurance providers

Name of companies /providers	Avg hour	Respondents	Percentage
Shikhar	0.80	46	71.9
NECO	0.52	5	7.8
Agriculture Development Bank	1.50	3	4.7
Prudential	2.50	2	3.1
Nepal Insurance	0.70	2	3.1
Himalayan General ICL	1.35	5	7.8
Joint (Shikhar /Nepal insurance	1.00	1	1.6
Grand Total	0.91	64	64.0

Source: Field survey, 2021

#### Appendix 6: Farming experience of the respondents (%)

Years	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
≤ 5 year	15.625	1.56	1.56	1.56	3.125	23.43
5-10 year	23.4375	1.56	1.56	6.25		32.8075
10-15 year	14.0625		1.56	3.125	6.25	24.9975
>15 year	9.375	1.56	3.125	1.56	3.125	18.745
<b>Grand Total</b>	62.5	4.68	7.805	12.495	12.5	99.98

Source: Household Survey, 2021

### Appendix 7: Details of insurance product with premium rate, land size, period

S.N	Insurance products	Premium rate	Minimum area required*	COP/value based	Duration of contract
1	Vegetable	5%	5 kattha in Terai and 2 ropani in hill and 1 ropani in Mountain	Input based	3 months
2	Vegetable (49 types)	7% for value based	„	Value based	3 month
3	Ginger	7%	Hill: 1 rop, Terai: 2 kattha	Value based	8 months
4	Turmeric	5%	„	Value based	9 month
5	Coffee	5%		Cherry (value based) Input based: first year	
6	Cereals seed multiplication	5%		Value based	3 month
7	Spring rice	5%		Value based	3 month
8	Apple	8%		WI (weather index based)	1 Year
9	Rice	5% per crop		CoP based	3 month
10	Fruits/year	5% per crop		CoP based	1 year
11	Citrus	5%	25 plants = 1 ropani	Value based	1 year
12	Potato	5% per crop	1 ropani	CoP based	3 month
13	Mushroom	5% per crop	NA	COP based	2 month
14	Cardamom	5% per crop	0.5 ropani	CoP based	1-16 yr
15	Banana (Pro rata basis for > a year)	5% per crop	1 ropani	CoP based	Year
16	Sugarcane	5% per crop	„	Value based	Year
17	Dragon fruit	5% per crop	„	CoP based	Year

- Note: For ensuring personal case such as death happens of the insurers during the crop insurance period, incumbent should pay extra charges @ Rs 0.5 /thousand for a year and Rs 0.25/thousand below than one year duration of insurance. Insured sum: 200000. Rs Additional ticket fee equals Rs 20
- 15% additional discount in premium for group-based insurance purchase

\* Crop and livestock Directive 2077, effective from 1<sup>st</sup> Magh 2077 mentioned that minimum land for crop cultivation would be 4 Aana (0.25 ropani) in Hill and mountain and half kattha (169.39 M<sup>2</sup>) in Terai.



**Appendix 8: Additional crop area, production and value more than insured crop**

	District	Chitwan	Makwanpur	Dhading	Kavre	Nuwakot	Grand Total
Crop 1	area	216.28	9	77.5	48	2	352.78
	output	41550	1000	10850	13000	60	66460
	value	1439750	25900	670000	520000	8000	2663650
Crop 2	area	64.9	7	31	21		123.9
	output	17100	4300	3500	4000		28900
	value	389500	103100	141000	111500		745100
Crop 3	area	27.9	2	8			37.9
	output	4100	120	9000			13220
	value	126600	12000	200000			338600
Total	area	309.08	18	116.5	69	2	514.58
	output	62750	5420	23350	17000	60	108580
	value	1955850	141000	1011000	631500	8000	3747350

Note: Crop 1: Paddy, maize, vegetables, pulses, others, Crop 2: Paddy, maize, Crop3: wheat, vegetable, others.

### Appendix 9: Time-series status of crop insurances in the study area

FY	No of policies	Area (ha)	Sum insured	Premium collected	Premium paid	Subsidy in premium	Claim #	Sum of crop loss
2070-71	1	1	3200000	160000	40000	120000	1	25000
71-72	2	7.5	4250000	212500	53125	159375	9	1500000
72-73	3	9.1	3970000	198500	49625	148875	4	198500
73-74	12	13.25	4282500	214125	54550	163650	8	120000
74-75	16	22.25	7816000	390800	104400	255900	7	900000
75-76	26	49.77	15517700	775885	200202	559112	25	745500
76-77	44	110.87	67478100	3373905	956860	2609850	32	10791122
77-78	57	145.67	95829825	4791491.25	1307194	3927717	10	924450

Fiscal year	Crops policies purchases
2070-71	Banana
71-72	Banana, capsicum
72-73	Banana, cauliflower
73-74	Banana, capsicum, cauliflower, cucumber, spring rice, tomato, cardamom
74-75	Banana, bottle gourd, cucumber, mushroom, potato, tomato, wheat seed, cabbage, coffee, cardamom
75-76	Banana, strawberry, dragon fruit, papaya, cucumber, cabbage, tomato, potato, mushroom.
76-77	Banana, citrus, cucurbits, cauliflower, mushroom, potato, spring rice, tomato, wheat seed
77-78	Banana, cauliflower, capsicum, chilli, mushroom, potato, spring rice, tomato, wheat seed

### Appendix 10: Other insurance the respondents following in the study area

	life insurance	livestock insurance	house insurance	other insurance	Total premium paid annually
Chitwan	242900	30375		10100	283375
Makwanpu	605000	1236	20450	400	627086
Dhading			18750	13750	32500
Kavre	115000	15000		1400	131400
Nuwakot	79500	20375			99875
Grand Total	1042400	66986	39200	25650	1174236

**Appendix 11: If continue without preconditions, the maximum premium willing to pay**

District	>2%	2-3%	3-4%	4-5%	>5%	Grand Total
Chitwan	30.3	30.3	9.1	0.0	0.0	69.7
Makwanpur	0.0	0.0	0.0	0.0	6.1	6.1
Dhading	3.0	0.0	0.0	0.0	3.0	6.1
Kavre	0.0	0.0	0.0	3.0	6.1	9.1
Nuwakot	0.0	3.0	0.0	6.1	0.0	9.1
Grand Total	33.3	33.3	9.1	9.1	18.2	100.0

**Appendix 12: On-farm engagement, employment and income**

District	On-farm Engagement week	# Employed in livestock	Sum of employed family in crop and livestock		Total income	Share of income	Share of income/week
Chitwan	536	37	123	160	83367000	521043.75	155535.4
Makwanpur	36	3	8	11	3400000	309090.91	94444.44
Dhading	57	8	10	18	15670000	870555.56	274912.3
Kavre	91	10	31	41	9550000	232926.83	104945.1
Nuwakot	135	16	23	39	11279000	289205.13	83548.15
Grand Total	855	74	195	269	123266000	458237.92	144170.8

### Appendix 13: Few photos of Field survey and consultation



KII with AKC Chief, Nuwakot



Study team



Questionnaire pre-testing



Household survey in Chitwan