

An Overview of Overall Agriculture Insurance Sector of Nepal with analysis of Crop and Livestock Insurance Subsectors

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ABSTRACT

Agriculture contributes 23.95% of the Nepal's GDP (MoALD, 2022) employing 57.3% of the total workforce of Nepal (National Census, CBS, 2023). Farmers face a variety of risks, including natural disasters, market-related risks, technical risks, systemic risks such as changing and uncertain legal and regulatory policies, trade and market policies, governance-related uncertainties, weak institutional capacity, and financial risks. Agricultural production is a high-risk activity subject to several contingencies, resulting in volatile and unpredictable farm incomes from year to year. Agriculture insurance provides an opportunity to shift natural risks, increase production and improve the well-being and utility of rural households. Agricultural insurance is also widely believed to have played an important role in stabilizing national economic conditions and providing motivation to poor rural households to adopt new technologies. Insurance Board (Beema Samiti), Government of Nepal, has been implementing Agriculture Insurance Program since 2013 but its proper implementation and regulation has not been intensively practiced to date (Bima Samitee, 2019 and Timilsina et al 2018). The descriptive analysis of the data from the 10 years' period shows that the agriculture insurance sector is growing slowly in Nepal. The performance ratio indicators like loss ratio, break-even ratio, premium to sum insured ratio, claims to sum insured ratio suggests positive environment for insurance companies as well as the farming community i.e. profitability of insurance companies and low burden of premium for farming community.

Keywords: *Insurance, Agriculture insurance, Crop insurance, Livestock insurance, CAGR, Ratio indicators, Nepal, Annual Growth Rate*

INTRODUCTION

For Nepal, agriculture remains particularly important, with contribution to 23.95% of the country's GDP (MoALD, 2022) and employing 57.3% of the total workforce of Nepal as in 2023 (National Census, CBS, 2023). The development of a country depends on the development of its agricultural sector. Agriculture is not only the source of bread and butter, but also the source of important raw materials for the agricultural industry in Nepal. The agricultural sector accounts for over 60% of the total national exports (CBS, 2014). The country owns 21% of the total area to farmland as in 2023 (MoALD, 2023). Farmers face a variety of risks, including natural disasters, market-related risks, technical risks, systemic risks, and financial risks. Agricultural production is a high-risk activity subject to several contingencies, resulting in volatile and unpredictable farm incomes from year to year. Bakst et al. (2016) reported that the United

States Department of Agriculture (USDA) Economic Research Service has identified five types of agricultural risks. (1) human and personal risks (e.g., human health); (2) institutional risks (related to government actions); (3) financial risks (e.g., access to capital); (4) price or market risks; and (5) production risks (such as weather and pests). Numerous risk mitigation strategies are available to address the challenges posed by climatic and natural factors in agriculture. Crop insurance serves as an instrumental measure in the mitigation of anticipated yield losses across various crop varieties. Insurance is “a contract for reducing losses from an accident incurred by an individual party through a distribution of the risk of such losses among several parties”. Agricultural insurance can be described as a contractual arrangement established between insurance entities and farmers, often small-scale landholders. Within this arrangement, farmers contribute

risk premiums to the insurance providers in exchange for coverage pertaining to their agricultural crops and/or livestock. This framework serves as a protective mechanism, ensuring that farmers are entitled to financial compensation in the event of damage or destruction of the insured commodities, whether attributed to climate-related risks or other factors beyond their sphere of influence. The potential consequences of such adverse occurrences can carry significant financial burdens for farmers, to the extent that even a singular occurrence has the potential to disrupt their livelihoods significantly. (Thapa and Adhikari, 2018). Created over 200 years ago, crop insurance has been used for a long time (Smith and Glauber, 2012). Crop insurance refers to insurance that offers financial coverage for production or sales losses (Mahul and Stutley, 2010).

The Nepal Insurance Authority, referred to as "Beema Pradhikaran" in the Nepali language, operates as an autonomous entity responsible for overseeing insurance regulations within Nepal. It operates under the jurisdiction of the Ministry of Finance, Government of Nepal. Beema Samiti has delegated the authority to twenty private non-life insurance companies to execute the implementation of crop and livestock insurance in alignment with the guidelines established in the Crop and Livestock Insurance Directives of 2013. It is noteworthy that these directives were recently revised in 2020, now referred to as the Crop and Livestock Directives of 2077 (Bima Samiti, 2077). There are 26 types of policies endorsed in the crop and livestock sector by the Nepal Insurance Authority. Insurance Board of Nepal is involved in formulation of insurance policy of each crop with the coordination with Department of Agriculture (DOA) under the of Ministry of Agriculture and Livestock Development (MoALD). The government and its affiliated organizations have embraced insurance as a service-centric industry, signifying a notable contribution to the GDP, accounting for 2.82% in the fiscal year 2018, with a continuous upward trend in its contribution (Bhattarai, 2020).

Nepal's agricultural insurance coverage rate is notably low, standing at just 1.10%, ranking as the least among Asian nations (Thapa and Adhikari, 2018). Nepal has introduced a crop insurance program; however, it hasn't been effectively executed so far (Devkota et al., 2021). The factors limiting the program's success include limited adoption of these initiatives, low engagement from the intended beneficiaries, among others. Given the minimal involvement of farmers in crop insurance, the sustainability of this system remains highly uncertain. The shortage of insurance agents, coupled with a deficiency in the effective promotion of agricultural insurance in remote regions, further compounds the challenge. Additionally, there exists an apparent knowledge gap among stakeholders concerning the execution of the insurance program and regarding the advantages they can garner from the

government-sponsored agricultural insurance initiatives. The Nepalese government annually earmarks substantial funds to underwrite premium subsidies for crop insurance. Furthermore, insurance companies are designated for each district within the country. The scarcity of insurance providers in remote regions signifies that the incentive provided by government agricultural insurance policies has not been compelling enough (Bishwakarma and Rana, 2021).

METHODOLOGY

Research in which the events have taken place prior to undertaking the investigation fall under ex-post facto research. In this type of design, the investigator has no scope to manipulate the independent variables, as these have already occurred. Inferences on the relationships between independent and dependent variables are basically drawn based on effects already manifested.

This study employed a mixed-method (quantitative and qualitative) approach to elicit the scenario of agriculture insurance in Nepal. The data was obtained from the government reports, Beema Samiti, Insurance Companies and through other literatures on "Google Scholar", "Scopus" and "ResearchGate" platforms that are relevant to agriculture, insurance, agriculture insurance. The secondary data required for the study was collected through desk study of reports, proceedings, books and journals of the concerned field like Beema Samiti, Department of Agriculture (DOA), Department of Livestock Services (DLS), District Livestock Services Offices (DLSOs), Ministry of Agriculture and Livestock Development (MoALD), Statistical Information on Agriculture, Central Bureau of Statistics (CBS). In addition to this information was collected through review articles, bulletins, proceedings, and internet browsing as archival research which relies on administrative records and documents as principal sources of data. After the data collection process, the unprocessed data underwent a series of procedures such as editing, coding, tabulation, and analysis. The data entry procedures were carried out using the Microsoft Excel Program. Then the tabulated data was subjected to statistical analysis using different software programs like SPSS, STATA etc. Then, inference was drawn in the form of narrative summary.

Compound Annual Growth Rate (CAGR)

From the data collected for the various parameters (Y) regarding the crop insurance scheme, like the number of adopter farmers and farmers benefitted, the premium collected, sum insured and claims filed through the years, the compound annual growth rate was determined to estimate the annual growth rate of the variables that had to bring about the total overall growth.

It is calculated as follows:

$$Y_t = Y_0(1 + r)^t$$

Where,

Y_t = Value at the t^{th} year

Y_0 = Value at base year

r = Compound Annual Growth Rate (CAGR)

t = 1,2, 3...,8 years

Percentage Analysis.

The percentages and averages were calculated of the different aspects of agriculture insurance such as total number of policy issued, sum insured, premium collected, claims approved, subsidy disbursed in the nine years' time period.

Ratio Indicators

Various performance indicators/ratio indicators were calculated according to the methodology used in the studies by of Mishra; (1994); Vyas and Singh (2006); Raju and Chand; (2010); Baliram (2011); Mahajan (2014); Swain; (2016); Sharon (2019); Soju (2022).

Loss ratio

Loss ratio was calculated to know financial viability of crop insurance schemes as follows:

Loss ratio =

Break-even ratio

Break-Even Ratio was calculated by considering the total amount of compensation paid and total amount of premiums collected.

Breakeven ratio =

Claims to Sum Insured Ratio

The ratio of claims to sum insured was calculated using the formula given below.

Claims to sum insured ratio =

Premium to Sum Insured ratio

The ratio of premium to sum insured was calculated using the formula given below.

Premium to sum insured ratio =

RESULTS

Company wise profile of overall agriculture insurance in fiscal year 2022/23

In FY 2022/23, 20 authorized insurance companies implemented agricultural insurance in Nepal. They issued 193,201 policies, with Shikhar Insurance (35,978), NLG Insurance (30,811), and Prudential Insurance (20,983) leading. Prabhu Insurance had the lowest performance with 1,264 policies. The total sum insured was Rs. 50,449,694,872.15. Shikhar Insurance led with Rs. 7,18,88,42,621, while Prabhu Insurance had the least at Rs. 713,672,113.9. Total premium collected was Rs. 2,195,243,154.36, with Shikhar Insurance collecting the most (Rs. 367,982,437.3) and Prabhu Insurance the least (Rs. 33,502,476.5). The Nepal government provided a subsidy of Rs. 1,657,603,735.51, with Shikhar Insurance receiving the most (Rs. 28,46,32,795.2) and Prabhu Insurance the least (Rs. 2,65,54,600.14), as per table 1.1.

Table 1.1: Total number of Policy Issued, total amount of Premium Collected, total amount of Sum Insured and total amount of Subsidy paid in overall agriculture sector in Fiscal Year 2022/23

S.N.	Insurance Companies	No. of policies issued	Sum Insured (NRs.)	Premium Collected (NRs.)	Subsidy Paid (NRs.)
1	Shikhar Insurance Company Ltd.	35978	7188842621	367982437.3	284632795.2
2	NLG Insurance Company Ltd.	30811	5627660858	268835233.9	203594966.3
3	Prudential Insurance Company Ltd.	20983	6574370549	245464939.4	185954277.9
4	Lumbini General Insurance Company Ltd.	17967	2091878113	103802789.6	79183611.47
5	Ajod Insurance Company Ltd.	15303	2788579370	132270394.3	98136747.27
6	Himalayan General Insurance Company Ltd.	13831	2749275837	129765658.7	96965268.89
7	IME General Insurance Company Ltd.	9897	3833234122	148368609.8	110716721.5
8	NECO Insurance Company Ltd.	7792	5318802713	199954057	153585381.4
9	Sagarmatha Insurance Company Ltd.	5708	2210119875	99028852.68	66108041.4
10	United Insurance Company Ltd.	5114	1161046701	58060415	43610739.1

11	Siddhartha Insurance Company Ltd.	5029	2281103694	92118895.98	70536224.72
12	Premier Insurance Company Ltd.	4085	664209851.1	25657244	19606126.9
13	The Oriental Insurance Company Ltd.	3832	1318396629	63798079.58	48136887.4
14	Nepal Insurance Company Ltd.	3609	2801641789	89882998.04	67234402.03
15	Rastriya Bima Company Ltd.	2926	352976629.9	17127678.45	12898723.17
16	General Insurance Company Nepal Ltd.	2825	761745111	31243617.47	23671782.83
17	Everest Insurance Company Ltd.	2794	784596020.9	38546050.86	29422302.28
18	Sanima General Insurance Company Ltd.	2082	946949790.1	37175039.55	27442156.72
19	National Insurance Company Ltd.	1371	280592483.1	12657686.2	9611978.96
20	Prabhu Insurance Company Ltd.	1264	713672113.9	33502476.5	26554600.14
	Total	193,201	50,449,694,872.15	2,195,243,154.36	1,657,603,735.51

Table 1.2: Percentage share of each insurance companies with respect to total policies issued, total premium collected, total sum insured, and total subsidy provided in overall agriculture sector in Fiscal Year 2022/23

S. N	Insurance Companies	Policy Issued percentage	Sum Insured Percentage	Premium Collected Percentage	Subsidy Percentage
1	Shikhar Insurance Company Ltd.	18.62	14.25	16.76	17.17
2	NLG Insurance Company Ltd.	15.95	11.15	12.25	12.28
3	Prudential Insurance Company Ltd.	10.86	13.03	11.18	11.22
4	Lumbini General Insurance Company Ltd.	9.30	4.15	4.73	4.78
5	Ajod Insurance Company Ltd.	7.92	5.53	6.03	5.92
6	Himalayan General Insurance Company Ltd.	7.16	5.45	5.91	5.85
7	IME General Insurance Company Ltd.	5.12	7.60	6.76	6.68
8	NECO Insurance Company Ltd.	4.03	10.54	9.11	9.27
9	Sagarmatha Insurance Company Ltd.	2.95	4.38	4.51	3.99
10	United Insurance Company Ltd.	2.65	2.30	2.64	2.63
11	Siddhartha Insurance Company Ltd.	2.60	4.52	4.20	4.26
12	Premier Insurance Company Ltd.	2.11	1.32	1.17	1.18
13	The Oriental Insurance Company Ltd.	1.98	2.61	2.91	2.90
14	Nepal Insurance Company Ltd.	1.87	5.55	4.09	4.06
15	Rastriya Bima Company Ltd.	1.51	0.70	0.78	0.78
16	General Insurance Company Nepal Ltd.	1.46	1.51	1.42	1.43
17	Everest Insurance Company Ltd.	1.45	1.56	1.76	1.77
18	Sanima General Insurance Company Ltd.	1.08	1.88	1.69	1.66

19	National Insurance Company Ltd.	0.71	0.56	0.58	0.58
20	Prabhu Insurance Company Ltd.	0.65	1.41	1.53	1.60
	Total	100.00	100.00	100.00	100.00

Company wise profile of Crop Insurance in fiscal year 2022/23

In FY 2022/23, a total of 7,261 crop insurance policies were issued. Shikhar Insurance Company Ltd. led with 4,627 policies, followed by Oriental Insurance Company Ltd. (646) and Siddhartha Insurance Company Ltd. amounting only 494 policies. General Insurance Company had no policies, and United Insurance Company Ltd. issued the least i.e. only 4 policies. The total sum insured in the crop insurance sector was Rs. 3,573,621,392.32. Shikhar Insurance Company Ltd. had the highest sum insured (Rs. 1,795,239,379.34), while United Insurance Company Ltd. had the least (Rs. 2,807,470.00).

A total premium of Rs. 20,44,06,385.51 was collected, with Shikhar Insurance Company Ltd. leading (Rs. 1,13,25,0748.86), followed by Oriental Insurance Company Ltd. (Rs. 91,95,408.63) and Siddhartha Insurance Company Ltd. (Rs. 42,39,985.08). United Insurance Company Ltd. collected the least (Rs. 1,40,374). The Nepal government provided a subsidy of Rs. 15,65,91,646.68. Shikhar Insurance Company Ltd. received the highest subsidy (Rs. 8,88,56,099.57), while United Insurance Company Ltd. received the lowest (Rs. 1,12,299.20).

SN	Insurance Companies	No. of policies issued	Sum Insured (NRs.)	Premium Collected (NRs.)	Subsidy Paid (NRs.)
1	Shikhar Insurance Company Ltd.	4627	1795239379.34	113250748.86	88856099.57
2	The Oriental Insurance Company Ltd.	646	155863340.13	9195408.63	7266345.83
3	Siddhartha Insurance Company Ltd.	494	80031409.50	4239985.08	3245141.57
4	Nepal Insurance Company Ltd.	345	308001789.79	15619367.06	11358646.05
5	Himalayan General Insurance Company Ltd.	254	122655662.96	6132783.15	3865572.26
6	Prudential Insurance Company Ltd.	193	182035766.83	9270401.30	6863706.18
7	NECO Insurance Company Ltd.	128	201845275.36	9978323.47	7464250.07
8	Sagarmatha Insurance Company Ltd.	91	103379570.00	5320407.44	3347317.13
9	IME General Insurance Company Ltd.	82	214506323.63	10596918.33	8204608.46
10	NLG Insurance Company Ltd.	81	86809008.10	4506310.40	3469703.20
11	Rastriya Bima Company Ltd.	77	19548640.00	938453.95	674613.58
12	National Insurance Company Ltd.	56	16124483.07	806223.70	644911.46
13	Ajod Insurance Company Ltd.	54	36499079.17	1945953.96	1405007.55
14	Everest Insurance Company Ltd.	39	39802783.37	1989879.17	1528852.47
15	Sanima General Insurance Company Ltd.	28	22533427.50	1177777.93	850202.84
16	Prabhu Insurance Company Ltd.	26	166760316.50	8338185.83	6670412.66
17	Lumbini General Insurance Company Ltd.	24	9564755.00	478238.25	379440.60
18	Premier Insurance Company Ltd.	12	9612912.07	480645.00	384516.00
19	United Insurance Company Ltd.	4	2807470.00	140374.00	112299.20
20	General Insurance Company Nepal Ltd.	0	0	0	0
	Total	7,261.00	3,573,621,392.32		156,591,646.68

S.N.	Insurance Companies	Policy issued percentage	Sum Insured Percentage	Premium Collected Percentage	Subsidy percentage
1	Shikhar Insurance Company Ltd.	63.72	50.24	55.40	56.74

2	The Oriental Insurance Company Ltd.	8.90	8.62	4.50	4.64
3	Siddhartha Insurance Company Ltd.	6.80	6.00	2.07	2.07
4	Nepal Insurance Company Ltd.	4.75	5.65	7.64	7.25
5	Himalayan General Insurance Company Ltd.	3.50	5.09	3.00	2.47
6	Prudential Insurance Company Ltd.	2.66	4.67	4.54	4.38
7	NECO Insurance Company Ltd.	1.76	4.36	4.88	4.77
8	Sagarmatha Insurance Company Ltd.	1.25	3.43	2.60	2.14
9	IME General Insurance Company Ltd.	1.13	2.89	5.18	5.24
10	NLG Insurance Company Ltd.	1.12	2.43	2.20	2.22
11	Rastriya Bima Company Ltd.	1.06	2.24	0.46	0.43
12	National Insurance Company Ltd.	0.77	1.11	0.39	0.41
13	Ajod Insurance Company Ltd.	0.74	1.02	0.95	0.90
14	Everest Insurance Company Ltd.	0.54	0.63	0.97	0.98
15	Sanima General Insurance Company Ltd.	0.39	0.55	0.58	0.54
16	Prabhu Insurance Company Ltd.	0.36	0.45	4.08	4.26
17	Lumbini General Insurance Company Ltd.	0.33	0.27	0.23	0.24
18	Premier Insurance Company Ltd.	0.17	0.27	0.24	0.25
19	United Insurance Company Ltd.	0.06	0.08	0.07	0.07
20	General Insurance Company Nepal Ltd.	0.00	0.00	0.00	0.00
	Total	100.00	100.00	100.00	100.00

Company wise profile of Livestock Insurance in fiscal year 2022/23

In FY 2022/23, livestock insurance saw 185,940 policies issued. Top performers were Shikhar Insurance (31,351), Oriental Insurance (30,730), and Siddhartha Insurance (20,790). General Insurance had the lowest with 1,238 policies. Total sum insured was Rs. 46,87,60,73,479.83, Siddhartha Insurance leading with Rs. 6,392,334,782.60,

and United Insurance the least at Rs. 546,911,797.40. Premium collected amounted to Rs. 20,44,06,385.51, with Oriental Insurance (Rs. 26,43,28,923.46), Shikhar Insurance (Rs. 25,47,31,688.48), and Siddhartha Insurance (Rs. 23,61,94,538.13) leading. General Insurance collected the least with Rs. 2,51,64,290.67. Nepal's government subsidized Rs. 1,99,08,36,768.85. The highest subsidy went to Oriental Insurance (Rs. 200,125,263.07), while General Insurance received the least (Rs. 1,98,84,187.48), as per table 1.5.

S.N.	Insurance Companies	No of policy issued	Sum Insured (NRs.)	Premium Collected (NRs.)	Subsidy Paid (NRs.)
1	Shikhar Insurance Company Ltd.	31,351	5,393,603,241.43	254,731,688.48	195,776,695.60
2	The Oriental Insurance Company Ltd.	30,730	5,540,851,850.32	264,328,923.46	200,125,263.07
3	Siddhartha Insurance Company Ltd.	20,790	6,392,334,782.60	236,194,538.13	179,090,571.68
4	Nepal Insurance Company Ltd.	17,943	2,082,313,358.00	103,324,551.40	78,804,170.87
5	Himalayan General Insurance Company Ltd.	15,249	2,752,080,290.50	130,324,440.37	96,731,739.71
6	Prudential Insurance Company Ltd.	13,577	2,626,620,174.10	123,632,875.56	93,099,696.63
7	NECO Insurance Company Ltd.	9,815	3,618,727,798.58	137,771,691.45	102,512,113.02
8	Sagarmatha Insurance Company Ltd.	7,664	5,116,957,437.15	189,975,733.49	146,121,131.37
9	IME General Insurance Company Ltd.	5,617	2,106,740,305.15	93,708,445.24	62,760,724.27
10	NLG Insurance Company Ltd.	5,110	1,158,239,231.20	57,920,041.00	43,498,439.90
11	Rastriya Bima Company Ltd.	4,535	2,201,072,284.65	87,878,910.90	67,291,083.16
12	National Insurance Company Ltd.	4,073	654,596,939.00	25,176,599.00	19,221,610.90
13	Ajod Insurance Company Ltd.	3,264	2,493,639,999.37	74,263,630.98	55,875,755.98
14	Everest Insurance Company Ltd.	3,186	1,162,533,289.35	54,602,670.95	40,870,541.56
15	Sanima General Insurance Company Ltd.	2,849	333,427,989.93	16,189,224.50	12,224,109.60
16	Prabhu Insurance Company Ltd.	2,825	761,745,111.00	31,243,617.47	23,671,782.83
17	Lumbini General Insurance Company Ltd.	2,755	744,793,237.50	36,556,171.69	27,893,449.82
18	Premier Insurance Company Ltd.	2,054	924,416,362.60	35,997,261.62	26,591,953.88
19	United Insurance Company Ltd.	1,315	264,468,000.00	11,851,462.50	8,967,067.50
20	General Insurance Company Nepal Ltd.	1,238	546,911,797.40	25,164,290.67	19,884,187.48
	Total	185940	46,876,073,479.83	1990836768.85	1501012088.83

S.N.	Insurance Companies	Policy issued percentage	Sum Insured Percentage	Premium percentage	Subsidy Percentage
1	Shikhar Insurance Company Ltd.	16.86	11.51	12.80	13.04
2	The Oriental Insurance Company Ltd.	16.53	11.82	13.28	13.33
3	Siddhartha Insurance Company Ltd.	11.18	13.64	11.86	11.93
4	Nepal Insurance Company Ltd.	9.65	4.44	5.19	5.25
5	Himalayan General Insurance Company Ltd.	8.20	5.87	6.55	6.44

6	Prudential Insurance Company Ltd.	7.30	5.60	6.21	6.20
7	NECO Insurance Company Ltd.	5.28	7.72	6.92	6.83
8	Sagarmatha Insurance Company Ltd.	4.12	10.92	9.54	9.73
9	IME General Insurance Company Ltd.	3.02	4.49	4.71	4.18
10	NLG Insurance Company Ltd.	2.75	2.47	2.91	2.90
11	Rastriya Bima Company Ltd.	2.44	4.70	4.41	4.48
12	National Insurance Company Ltd.	2.19	1.40	1.26	1.28
13	Ajod Insurance Company Ltd.	1.76	5.32	3.73	3.72
14	Everest Insurance Company Ltd.	1.71	2.48	2.74	2.72
15	Sanima General Insurance Company Ltd.	1.53	0.71	0.81	0.81
16	Prabhu Insurance Company Ltd.	1.52	1.63	1.57	1.58
17	Lumbini General Insurance Company Ltd.	1.48	1.59	1.84	1.86
18	Premier Insurance Company Ltd.	1.10	1.97	1.81	1.77
19	United Insurance Company Ltd.	0.71	0.56	0.60	0.60
20	General Insurance Company Nepal Ltd.	0.67	1.17	1.26	1.32
	Total	100.00	100.00	100.00	100.00

Performance of crop insurance sector from Fiscal Year 2014/15 to 2022/23

Policy Issued in crop insurance sector from Fiscal Year 2014/15 to 2022/23

The trajectory of total policies issued, and farmers covered under the crop insurance program from 2014/15 to 2022/23 exhibited an overall upward trend, punctuated by notable declines in 2017/18 (1573) and 2020/21 (3811) compared to the previous year's enrollments of 1829 in 2016/17 and 4278 in 2019/20. Despite a consistent and linear growth over the nine-year period, there is a diminishing annual growth rate in both farmers covered and policies issued. The initial Compound Annual Growth Rate (CAGR) stood at 2.750 in 2015/16, dropped to 0.902 in 2019/20 (midway through the period), and further decreased to 0.627 in the final year, 2022/23. This indicates that the expansion of farmers covered by the crop insurance program is experiencing a declining rate of increase.

Sum insured in crop insurance sector from Fiscal Year 2014/15 to 2022/23

The total sum insured under the various crop insurance schemes in Nepal was found to be increasing gradually. There was a major drop observed in the year 2018/19 with total sum insured being Rs. 61,40,28,151.5 compared to the previous year 2017/18 with total sum insured being Rs. 77,62,83,181.1. The Compound Annual Growth Rate calculated for each year suggests that the growth rate of sum insured is increasing in a decreasing rate. CAGR was calculated to be 8.752 for the initial period i.e., 2015/16 which was a very promising start to the insurance

program. The CAGR was found out to be 1.368 for the year 2019/20 which is the midpoint of the time series. The current CAGR of sum insured is 0.978. Although the annual growth rate has been reflecting an increase in the amount of sum insured over the years the CAGR suggests that the sum insured under various crop insurance schemes has been increasing at a decreasing rate.

Premium Collected in crop insurance sector from Fiscal Year 2014/15 to 2022/23

Various literature and past studies suggest that the premium collected from the farmers should not be an amount that builds a burden to the farmers forcing them to quit continuing the agricultural insurance. The analysis of Compound Annual Growth Rate of premium collected over the years starting from the year 2014/15 to 2022/23 suggests that the current scenario has a mild but positive growth of premium collected. The CAGR at the beginning was calculated and found to be 8.74 in the year 2015/16. This growth was also due to the increase in the overall number of policies issued and total sum insured in the beginning years. The current CAGR for the year 2022/23 is calculated to be 0.98 which reflects slow growth in the total sum insured as well as no significant increase of economic burden to the farming communities.

Subsidy amount disbursed in crop insurance sector from Fiscal Year 2014/15 to 2022/23

The government's subsidy amount reflects its support for

the farming community, and an increase in this subsidy indicates heightened government support. In 2014/15, the disbursed subsidy was Rs. 4,27,657.7, which grew to Rs. 15,65,91,647 in 2022/23. There was a significant drop in the subsidy in 2018/19 (Rs. 22,41,7948.5) compared to the previous year, 2017/18 (Rs. 28,94,1169.1). The Compound Annual Growth Rate (CAGR) of the subsidy suggests a decreasing rate of increase, starting at 13.616 in 2014/15, dropping to 1.57 in the midpoint year, 2019/20, and reaching 1.091 in 2022/23. Despite the declining CAGR, the positive rate indicates continued growth in the disbursed subsidy. The calculated annual growth rates also reveal an increasing trend in subsidy amounts for crop insurance. This rise in subsidy is expected to directly correlate with an increased adoption of agricultural insurance by small and marginalized farming communities, as indicated by various research findings.

Claim amount paid in crop insurance sector from Fiscal Year 2014/15 to 2022/23

The amount paid as claims to farmers in a given year is contingent on the losses incurred, occurrences of natural calamities, and other adverse conditions affecting crop production. Noteworthy periods for approved and paid claim amounts can be identified. In 2020/21, the claim amount was relatively low at Rs. 59,996,775.31 compared to the preceding year, 2019/20, where it was Rs. 86,801,498.22. Conversely, the claim amount saw a substantial increase in 2017/18, totalling Rs. 29,577,758.4, marking a 203.67% annual growth. Similarly, in 2022/23, there was a significant spike in the claim amount, reaching Rs. 703,062,970.2, signifying a remarkable 579.709% rise from the previous year. The Compound Annual Growth Rate (CAGR) indicates a gradual increase in the claim amount. Two key factors contribute to this trend: the expansion of policies issued, and farmers covered by the insurance program and an increased awareness among farmers about the claim process, resulting in a greater willingness to seek compensation over the years.

Performance of livestock insurance sector from Fiscal Year 2014/15 to 2022/23

Number of policy issued in livestock insurance sector from Fiscal Year 2014/15 to 2022/23

Livestock insurance trends from 2014/15 to 2022/23 show overall growth, with drops in 2018/19 (63,973) and 2022/23 (185,940) compared to previous years (73,751 in 2017/18 and 189,807 in 2021/22). The Compound Annual Growth Rate (CAGR) declined from 4.354 in 2015/16 to 0.810 in 2022/23, indicating a decreasing rate of growth in farmers covered by the program.

Sum insured in livestock insurance sector from Fiscal Year 2014/15 to 2022/23

The total sum insured in Nepal's livestock insurance schemes has shown gradual, constant linear growth from Rs. 61,01,01,070 in 2014/15 to Rs. 46,87,60,73,480 in 2022/23. The Compound Annual Growth Rate (CAGR) started promisingly at 3.98 in 2015/16, decreased to 1.03 in 2019/20 (midpoint), and is currently at 0.72. Although the annual growth rate indicates an increase, the CAGR suggests a decreasing rate of growth in sum insured under various livestock insurance schemes.

Premium Collected in livestock insurance sector from Fiscal Year 2014/15 to 2022/23

Analysing the Compound Annual Growth Rate (CAGR) of premiums from 2014/15 to 2022/23 indicates a mild but positive growth. Starting with a CAGR of 3.60 in 2015/16, the growth was influenced by increased policies and total sum insured in the initial years. The current CAGR for 2022/23 is 0.67, reflecting slow growth and no substantial economic burden on livestock farming communities.

Subsidy disbursed in livestock insurance sector from Fiscal Year 2014/15 to 2022/23

In 2014/15, the subsidy disbursed was Rs. 1,65,96,853.8, growing to Rs. 1,50,10,12,089 in 2022/23. Steady linear growth without declines is observed. The Compound Annual Growth Rate (CAGR) indicates an increasing but decreasing rate, starting at 5.89 in 2014/15, dropping to 1.12 in 2019/20, and finalizing at 0.76 in 2022/23. Despite the declining CAGR, the positive rate suggests growing trends in subsidy disbursed. Annual growth rates also show an increasing trend, indicating a correlation between subsidy increase and adoption of livestock insurance by small and marginalized farming communities, as found in various research.

Claim amount approved in livestock insurance sector from Fiscal Year 2014/15 to 2022/23

In 2021/22, the claim amount declined to Rs. 54,00,44,920.5 from the previous year's Rs. 562,039,765.9 in 2020/21. In 2016/17, a significant rise to Rs. 149,842,980.2 (150.22% annual growth) occurred. Similarly, in 2022/23, a steep spike to Rs. 1,21,52,92,183 (125.035% rise) was noted. The Compound Annual Growth Rate (CAGR) indicates a slow increase due to more policies, covered farmers, and increased awareness of the claim process over the years.

Performance of overall insurance sector from Fiscal Year 2014/15 to 2022/23

Number of policies issued in overall agriculture insurance sector from Fiscal Year 2014/15 to 2022/23

From 2014/15 to 2022/23, agriculture insurance policies and covered farmers increased but experienced major drops in 2018/19 (65,908) and 2022/23 (193,201). Over

the nine years, there was gradual growth, but the annual growth rate declined. The Compound Annual Growth Rate (CAGR) went from 4.219 in 2015/16 to 0.799 in 2022/23, indicating a decreasing rate of increase in covered farmers

Sum insured in overall agriculture insurance sector from Fiscal Year 2014/15 to 2022/23

The total sum insured in Nepal's agricultural insurance schemes has shown consistent gradual growth, maintaining a linear upward trend with no observed drops. In 2014/15, the sum insured was Rs. 625,404,613.8, and in 2022/23, it reached Rs. 50,449,694,872. The Compound Annual Growth Rate (CAGR) indicates a growth rate that is increasing at a decreasing rate. The CAGR started promisingly at 4.10 in 2015/16, dropped to 1.04 in 2019/20 (midpoint), and is currently at 0.73. Despite the annual growth rate showing an increase in the sum insured, the CAGR suggests a decreasing rate of growth in various agricultural insurance schemes.

Premium collected in overall agriculture insurance sector from Fiscal Year 2014/15 to 2022/23

Literature and past studies advise that agricultural insurance premiums should not burden farmers to the extent of discontinuation. Analysing the Compound Annual Growth Rate (CAGR) of premiums from 2014/15 to 2022/23 reveals a mild yet positive growth. The initial CAGR was 3.73 in 2015/16, driven by increased policies and total sum insured. The current CAGR for 2022/23 is 0.68, indicating slow growth and no substantial economic burden on farming communities.

Subsidy disbursed in overall agriculture insurance sector from Fiscal Year 2014/15 to 2022/23

Government subsidy reflects support to farmers, with an increase signalling enhanced backing for the farming community. In 2014/15, the subsidy was Rs. 17,024,511.5, growing to Rs. 1,657,603,736 in 2022/23. Steady linear growth is observed, with no decline in any given year. The Compound Annual Growth Rate (CAGR) suggests increasing subsidy in a decreasing rate, starting at 6.08 in 2014/15 and decreasing to 0.77 in 2022/23. Despite the declining CAGR, the positive rate indicates a growing trend in disbursed subsidies. Annual growth rates show an increasing trend, indicating a correlation between subsidy increase and adoption of agricultural insurance by small and marginalized farming communities, as found in various research.

Claim amount approved in overall agriculture insurance sector from Fiscal Year 2014/15 to 2022/23

The claim amount paid to farmers each year is influenced by losses, natural calamities, and unfavourable conditions during agriculture activities. No notable decline in

approved claim amounts occurred over the years. In 2015/16, the claim amount was Rs. 61,624,754.88, increasing to Rs. 1,918,355,154 in 2022/23. There was a significant spike in 2022/23, marking a 125.035% rise from the previous year. The Compound Annual Growth Rate (CAGR) indicates a slow increase in claim amounts, attributed to a rise in policies and farmers covered, along with increased awareness and willingness of farmers to claim compensation over the years.

Over the past nine years, the agriculture insurance sector in Nepal has consistently witnessed growth in key metrics like the number of policies issued, total sum insured, total premium collected, total subsidy disbursed, and total approved claims. Notably, the adoption of livestock insurance outpaces that of crop insurance. In the initial year, Fiscal Year 2014/15, livestock insurance constituted 91.58% of total policies issued in agriculture insurance, compared to 9.18% for crop insurance. In the latest year, Fiscal Year 2022/23, the share for livestock insurance increased to 96.24%, while for crop insurance, it was 3.75%. Similarly, the initial share of total sum insured in livestock insurance out of the total in agriculture insurance was 97.56% in Fiscal Year 2014/15, contrasting with 2.43% for crop insurance. In the latest year, Fiscal Year 2022/23, the share for livestock insurance was 92.91%, and for crop insurance, it was 7.08%. These findings underscore the substantial role of livestock insurance in the agriculture insurance sector, indicating that the crop insurance program has comparatively lower acceptance and popularity in Nepal. Furthermore, the percentage evaluation of insurance companies implementing agriculture insurance reveals that Shikhar Insurance Company Ltd, The Oriental Insurance Company Ltd, and Siddhartha Insurance Company Ltd were top performers, making significant contributions to the agriculture insurance industry.

Ratio indicators

The assessment of performance indicators in Nepal's agriculture insurance sector yielded noteworthy findings. The findings were also consistent with the findings of other of Mishra; (1994); Vyas and Singh (2006); Raju and Chand; (2010); Baliram (2011); Mahajan (2014); Swain; (2016); Sharon (2019); Soju (2022).

Loss Ratio

The loss ratio, indicating the profitability of the agricultural insurance sector in Nepal, is favorable, with an average of 0.551 over the nine-year period. Even in 2022/23, with high claims, the loss ratio was 0.874, maintaining profitability. Crop insurance, however, reveals challenges, with an average loss ratio of 1.107, suggesting sustained losses for insurance companies. In 2022/23, the loss ratio was 3.440, indicating significant challenges. Livestock insurance remains profitable, with an average loss ratio of 0.502. In 2022/23, despite increased claims, the loss ratio was 0.610, reflecting ongoing profitability. Over the nine-year period, the average Loss Ratio was 0.551,

indicating that for every rupee collected as premium, insurance companies paid 0.551 rupees as claim compensation to farmers. Despite authorities' belief that agriculture insurance isn't profitable in Nepal, the data suggests otherwise, highlighting the sector's profitability for companies.

Breakeven Ratio

The breakeven ratio, indicating the necessary compensation adjustment for premium equality, was -0.126 in 2022/23. This suggests a 0.126% increase in compensation for balance. The average breakeven ratio over nine years is -0.449, implying a 0.449% compensation increase for equilibrium. For crop insurance in 2022/23, the breakeven ratio was 2.440, signifying a required 2.440% compensation decrease for balance, the highest over the period. The average breakeven ratio is 0.107, suggesting a 0.107% compensation decrease for balance. In 2022/23 for livestock insurance, the breakeven ratio was -0.390, indicating a 0.390% compensation increase for balance. The average breakeven ratio is -0.498, suggesting a 0.498% compensation increase for equilibrium.

Claims to sum insured ratio

The claims to sum insured ratio provides the proportion of total amount for which the claims were filed to the total sum insured for that year. This ratio also gives us a perspective into the farmer's initiatives in claiming for their losses. Also, this ratio can be used to analyse the extent of fictitious claims filed. The overall agriculture insurance sector had an average claim to sum insured ratio of 0.047 over nine years, indicating a low incidence of fictitious claims. This suggests that farmer-paid premiums, along with government-subsidized premiums, can cover filed claims. In 2022/23, the claims to sum insured ratio was 0.038. For crop insurance, the nine-year average ratio was 0.060, also suggesting low fictitious claims, with a 2022/23 ratio of 0.197. In livestock insurance, the nine-year average was 0.023, signalling few fictitious claims, and the 2022/23 ratio was 0.026. This implies that the combined contribution of farmers' premiums and government subsidies is sufficient to cover the filed claims.

Premium to sum insured ratio

The premium to sum insured ratio gives an insight about the farmers share in the total amount insured in a given year. This ratio also gives an indication of level of burden placed on the farmers while imposing a compulsory insurance scheme. The premium-to-sum insured ratio for overall agriculture insurance has decreased from 0.054 in 2014/15 to 0.044 in 2022/23, reflecting government measures to ease the burden on farmers. In crop insurance, the ratio remained consistently low, going from 0.0562 in 2014/15 to 0.0572 in 2022/23. Similarly, for livestock insurance, the ratio decreased from 0.0554 in 2014/15 to 0.042 in 2022/23, indicating a continuous decline and government efforts to alleviate the farming community's

burden. The decreasing trend in the premium to sum insured ratio indicates consistent government efforts to alleviate the premium burden on farmers. This underscores the importance of continued and timely subsidy disbursement for the smooth implementation of agriculture insurance in Nepal.

Conclusion, policy recommendation

Conclusion

The analysis from nine years of data reveals that the agriculture insurance sector is slowly rising. The crop insurance sector has not been able to gain popularity and has wide adoption compared to the livestock insurance sector. The performance indicators register positive scenario with good profitability, low burden to companies and benefited farming community. Although the agricultural insurance sector is showing positive growth the CAGR suggests that the growth of the industry is increasing at a decreasing rate. There needs to be even more robust and proactive policy reforms and rigorous marketing models for increasing the adoption of agriculture insurance with increased awareness and willingness to adopt agriculture insurance which will endure safeguarding the farming community against several sources of risks.

Policy implications

1. There needs to be extensive awareness campaigns and programs to make farmers aware of the risk management strategy by agriculture insurance. This will insure the wider penetration and coverage of agriculture insurance program.
2. Agriculture insurance sector is quite profitable in case of Nepal as seen from the low loss ratio. This also implies that the premium price of the insurance could be decreased to encourage and motivate farmers to adopt agriculture insurance as affordability has been found to be a highly significant determining factor influencing adoption of agriculture insurance.
3. There needs to be timely and adequate disbursement of subsidy from the government to ensure the insurance companies are motivated and encouraged to promote agriculture insurance. Despite its good profitability, the insurance companies do not seem to be motivated to prioritize agriculture insurance, this might be due to the untimely and late disbursement of subsidies to the companies and also poor inclusion of the voice of the insurance companies while developing the policies. Also, many farmers have continued to adopt agriculture insurance due to affordability facilitated by the subsidy/support of government in purchasing agriculture insurance.
4. There is a serious need for developing attractive schemes linking agriculture insurance with other support programs in agriculture. This will also ensure accessibility of agriculture insurance to small and marginalized farmers. There is a need for high level of coordination, cooperation, efficient

communication among the stakeholders facilitating extensive policy reforms along with efficient and wider implementation channels.

Research implications

1. There is a need for extensive longitudinal studies of agriculture insurance based on commodity specific approach to assess the long-term impact of agriculture insurance in income, risk management and overall decision making process by a farming community.
2. In-depth study on the use of Information, Communication and Technologies (ICTs) like digitization of processes involved in agriculture insurance, remote sensing, GIS etc. on the implementation of agriculture insurance in Nepal. This will highlight the pathway for efficient execution of agriculture insurance and also help in checking the loopholes and minimize moral hazards associated.
3. Comparative analysis of status, aspects and impacts of agriculture insurance in Nepal with other countries with similar socio-economic background and similar agricultural characteristics could shed light for the way forward for the agriculture insurance in Nepal.
4. Extensive reviews and analysis of policies relating to agriculture insurance in Nepal with other developing, under-developed and developed countries could provide the scope for improvisation in policy with major reforms and also provide the estimate of global position of Nepal in policy related aspects.
5. There is a need of study relating to effective and efficient extension of agriculture insurance in Nepal so as to highlight the pathway for raising awareness, encouraging and motivating farmers to adopt agriculture insurance.

Table 1.7: Annual growth rate of aspects related to the agriculture insurance sector.

Nepalese Fiscal Year	2070.71	2071.72	2072.73	2073.74	2074.75	2075.76	2076.77	2077.78	2078.79
Fiscal Year	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Policy issued in overall agriculture insurance sector	1,759	9181	27557	75288	65908	116,858	129001	195015	193201
Annual growth rate	-	421.94	200.15	173.21	-12.46	77.30	10.39	51.17	-0.93
Policy issued in crop insurance	148	555	1829	1537	1935	4278	3811	5208	7,261
Annual growth rate	-	275	229.55	-15.96	25.89	121.08	-10.91	36.65	39.42
Policy issued in livestock sector	1611	8626	25728	73751	63973	112580	125190	189807	185940
Annual growth rate		435.44	198.26	186.65	-13.25	75.980	11.20	51.61	-2.03
Sum insured in overall agriculture insurance sector (NRs.)	625404614	3186822195	6038412224	9245061815	13222589024	22094876115	26380219599	43692047018	50449694872
Annual growth rate	-	409.56	89.48	53.1	43.02	67.09	19.39	65.62	15.46
Sum insured in crop insurance (NRs.)	15222744	148455001	438721000.7	776283131	614028151.5	1133737952	1607034007	2930604841	3573621392
Annual growth rate	-	875.21	195.52	76.94	-20.9	84.63	41.74	82.36	21.94
Sum insured in livestock insurance (NRs)	610181870	3038367194	5599691224	8468778684	12608560873	20961138163	24773185592	40761442177	46876073480
Annual growth rate	-	397.94	84.29	51.23	48.88	66.24	18.18	64.53	15
Premium collected in overall agriculture sector (NRs.)	34049023	161002516	278745080.7	425924705	574378282.5	1004763349	1181699788	1957890349	2195243154
Annual growth rate	-	372.85	73.13	52.8	34.85	74.93	17.61	65.68	12.12
Premium collected in crop insurance (NRs.)	855315.4	8330138.97	21633998	38588225.5	29890598	64912420.8	82923532.7	154829076	204406386
Annual growth rate	-	873.92	159.71	78.36	-22.53	117.16	27.74	86.71	32.02
Premium collected in livestock insurance (NRs.)	33193708	152672377	257111082.6	387336480	544487684.5	939850928.2	1098776255	1803061273	1990836769

Annual growth rate	-	359.94	68.4	50.64	40.57	72.61	16.9	64.09	10.41
Subsidy disbursed for overall agriculture sector (NRs.)	17024512	120565260	209058810	319443529	430783712	753569763	886274841	1467803153	1657603736
Annual growth rate	-	608.18	73.39	52.8	34.85	74.92	17.61	65.61	12.93
Subsidy disbursed in crop insurance (NRs.)	427657.7	6250965.86	16225498.5	28941169.1	22417948.5	48684315.6	62192649.5	116121807	156591647
Growth rate	-	1361.67	159.56	78.36	-22.53	117.16	27.74	86.71	34.85
Subsidy disbursed in livestock sector (NRs.)	16596854	114314294	192833312	290502360	408365763	704885447	824082191	1351681346	1501012089
Annual growth rate	-	588.77	68.68	50.64	40.57	72.61	16.91	64.02	11.04
Claim amount in overall agriculture insurance sector (NRs.)	-	61624754.9	159582878.2	259292543	316284268	567767435.2	622036541.2	643480695.1	1918355154
Annual growth rate	-	-	158.95	62.48	21.97	79.51	9.55	3.44	198.12
Claim amount in crop insurance (NRs.)	-	1741482.21	9739898	29577758.4	37698227.5	86801498.22	59996775.31	103435774.6	703062970.2
Annual growth rate	-	-	459.28	203.67	27.45	130.25	-30.88	72.4	579.71
Claim amount in livestock insurance (NRs.)	-	59883272.7	149842980.2	229714785	278586040.5	480965937	562039765.9	540044920.5	1215292183
Annual growth rate	-	-	150.22	53.3	21.27	72.64	16.85	-3.91	125.03

Table 1.8: Ratio indicators

Nepalese Fiscal Year	2070.71	2071.72	2072.73	2073.74	2074.75	2075.76	2076.77	2077.78	2078.79
Fiscal Year	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Loss Ratio of overall agriculture insurance sector		0.383	0.573	0.609	0.551	0.565	0.526	0.329	0.874
Loss Ratio of crop insurance sector		0.209	0.45	0.766	1.261	1.337	0.724	0.668	3.44
Loss Ratio of livestock insurance sector		0.392	0.583	0.593	0.512	0.512	0.512	0.3	0.61
Breakeven Ratio of overall agriculture insurance sector		-0.617	-0.427	-0.391	-0.449	-0.435	-0.474	-0.671	-0.126

Breakeven Ratio of crop insurance sector		-0.791	-0.55	-0.234	0.261	0.337	-0.276	-0.332	2.44
Breakeven Ratio of livestock insurance sector		-0.608	-0.417	-0.407	-0.488	-0.488	-0.488	-0.7	-0.39
Claims to Sum Insured Ratio of overall agriculture insurance sector		0.019	0.026	0.028	0.024	0.026	0.024	0.015	0.038
Claims to Sum Insured Ratio of crop insurance sector		0.012	0.022	0.038	0.061	0.077	0.037	0.035	0.197
Claims to Sum Insured Ratio of livestock insurance sector		0.02	0.027	0.027	0.022	0.023	0.023	0.013	0.026
Premium to Sum Insured Ratio of overall agriculture insurance sector	0.054	0.051	0.046	0.046	0.043	0.045	0.045	0.045	0.044
Premium to Sum Insured Ratio of crop insurance sector	0.056	0.056	0.049	0.049	0.048	0.057	0.052	0.053	0.057
Premium to Sum Insured Ratio of livestock insurance sector	0.054	0.05	0.046	0.046	0.043	0.045	0.044	0.044	0.042

Table 1.9: CAGR from Fiscal Year 2070/71 to 2078/79

CAGR from Year 2070/71 to 2078/79	CAGR of Overall Agriculture Insurance Sector	CAGR of Crop Insurance Sector	CAGR of Livestock Insurance Sector
Policy issued	0.799	0.627	0.81
Sum insured (NRs.)	0.73	0.978	0.72
Premium (NRs.)	0.68	0.98	0.67
Subsidy (NRs.)	0.77	1.091	0.76
Claim amount (NRs.)	0.63	1.356	0.537

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