



**नेपाल बीमा प्राधिकरण**  
**NEPAL INSURANCE AUTHORITY**

# **Hydropower Insurance in Nepal: Assessment of trends, challenges, and opportunities for reform**

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Assessment of trends, challenges,  
and opportunities for reform**

## Disclaimer

This report titled “Hydropower Insurance in Nepal: Assessment of trends, challenges, and opportunities for reform” has been prepared by the research department of Nepal Beema Pradhikaran as part of the ongoing efforts to strengthen the understanding, supervision, and development of Nepal’s hydropower insurance market. The report is based on an analysis of market data, insurer submissions, and onsite examination of selected claim files during the course of the study.

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## Foreword

The hydropower sector remains a key pillar of Nepal's economic development and energy security. As hydropower generation expands across the country, insurance has become increasingly important in protecting investments, supporting financial stability, and strengthening resilience against natural and operational risks.

This research report, "Hydropower Insurance in Nepal: Assessment of Trends, Challenges, and Opportunities for Reform," provides an important assessment of Nepal's hydropower insurance market through both off-site market analysis and on-site examination of hydropower claim files. The study offers valuable insights into premium trends, claims experience, settlement timelines, catastrophe exposure, reinsurance arrangements, and prevailing market practices.

The findings indicate that while hydropower insurance plays a critical role in supporting infrastructure development and risk transfer, the market continues to face several structural challenges. Prolonged claims settlement timelines, shortage of specialized technical expertise, concentration of risks in catastrophe-prone regions, and high dependence on reinsurance remain major concerns affecting market efficiency and sustainability.

The study also highlights the significant impact of climate and geography-related hazards, particularly floods and landslides, on hydropower projects in Nepal. These findings emphasize the need for stronger risk-based underwriting, improved claims management systems, enhanced technical capacity, and closer coordination among insurers, reinsurers, surveyors, developers, and regulators.

I would like to express my sincere appreciation to all insurers, technical experts, surveyors, and stakeholders who contributed to this study through their support, data, and valuable insights. I also extend my gratitude to the members of my research team Director Ms. Pujan Dhungel Adhikari, Director Mr. Nirmal Ahikari, Deputy Director Ms. Pushpa Kunwar, Acturial Analyst Mr. SomRaj Sharma and all those involved in the preparation and publication of this research.

I believe this report will serve as a useful reference for policymakers, insurers, hydropower developers, researchers, and other stakeholders in the insurance and energy sectors. The observations and recommendations presented in this study are expected to contribute toward strengthening market resilience, improving policyholder confidence, and promoting the long-term stability of Nepal's hydropower insurance market.

**Mr. Susil Dev Subedi**

Executive Director

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## Executive Summary

This report presents an integrated assessment of Nepal's hydropower insurance market based on a five-year off-site analysis of premiums and claims and a detailed on-site examination of 121 claim files from eight non-life insurers. In the first phase, an offsite analysis was carried out studying five years of premium and claims data across major hydropower insurance portfolios, including Contractor's All Risk (CAR), Erection All Risk (EAR), Property, Machinery Breakdown (MB), and Loss of Profit (LoP). The phase two involved detailed onsite examination of 121 paid claim files from eight non-life insurers to assess claims turnaround time (TAT), process bottlenecks, loss locations, causes of loss, sum insured characteristics, and reinsurance structures. The five-year analysis reveals several striking structural issues in Nepal's hydropower insurance market. Over the five-year period, hydropower insurance premiums have grown steadily in nominal terms. CAR and EAR portfolios dominate premium volumes, reflecting the concentration of insurance coverage during construction and erection phases. The five-year claims analysis shows a mismatch between premium accumulation and claims outgo, driven by catastrophe-linked losses and prolonged settlement timelines. Across portfolios, Machinery Breakdown claims show comparatively better loss behavior while EAR and Property Loss of Profit portfolios exhibit higher volatility and longer claim tails, reflecting technical complexity and dependency on specialized assessments.

Claims volatility is driven more by geographical location and peril concentration than by portfolio size, indicating limited application of risk-based pricing and insufficient differentiation based on hazard exposure. Surveyor capacity constraints have emerged as a systemic risk, materially affecting claims settlement outcomes, reserve adequacy, and overall market credibility. Furthermore, hydropower insurance profitability remains highly sensitive to a small number of extreme loss events, highlighting the fragility of the existing risk pool and the limited diversification benefits within the market. When compared with international benchmarks, claims settlement timelines in Nepal are significantly longer, underscoring the need for targeted regulatory, institutional, and capacity-building reforms to enhance market efficiency and resilience. The combined analysis reveals that hydropower insurance claims in Nepal are characterized by systemically long settlement timelines, with an overall median turnaround time of 298 days across all portfolios. The study finds that surveyor-related processes constitute the dominant bottleneck, accounting for approximately 62–75 percent of total claims settlement time. Delays at the stage of surveyor appointment, loss assessment, and submission of final survey reports are consistent across insurers and portfolios, indicating a market-wide structural issue rather than isolated operational inefficiencies. Among different portfolios, Machinery Breakdown claims demonstrate relatively better efficiency, with a median TAT of 215 days, while Erection All Risk and Property Loss of Profit claims exhibit the longest delays, reflecting higher technical complexity and dependence on specialized expertise.

The study also highlights significant geographical concentration of hydropower losses, with districts such as Sindhupalchowk, Lamjung, Panchthar, Ilam, and Kaski accounting for a disproportionate share of claims. In terms of causation, flood and landslide events account for approximately 77 percent of total hydropower losses, underscoring Nepal's acute exposure to climate- and terrain-related hazards. Most hydropower risks are insured under all-risk covers, and reinsurance arrangements are predominantly

structured through combined treaty and facultative placements, reflecting the large exposure size and limited domestic risk retention capacity. The Nepalese market exhibits substantially longer claims settlement timelines, limited availability of accredited hydropower-specialized loss adjusters, inefficiencies in claims management.

A key structural feature of the market is high exposure concentration, with large sums insured tied to geographically clustered projects in hazard-prone districts. This concentration significantly amplifies loss volatility and reinsurance dependence, particularly for large projects exceeding NPR 30 crore in sum insured. Loss experience is heavily skewed toward natural catastrophes, with flood and landslide accounting for approximately three-quarters of total hydropower claims. Claims are geographically concentrated, with a small number of districts contributing a disproportionate share of losses, highlighting weak spatial diversification. Large-value claims exhibit both higher severity and longer settlement periods, increasing incurred-but-not-reported (IBNR) pressure and reserve uncertainty. Overall, the findings indicate that while hydropower insurance in Nepal provides critical risk transfer support to the energy sector, claims management inefficiencies, technical capacity constraints, and high catastrophe exposure pose sustainability challenges. Addressing these issues is essential for improving insurer performance, strengthening policyholder confidence, and ensuring long-term stability of the hydropower insurance market.

# Introduction

### 1.1 Background of study

Hydropower, or hydroelectricity, is a renewable energy source that produces electricity from the flow of water in rivers and dams. It has been among the first and most widespread form of clean energy globally and particularly in Nepal, which has abundant water resources and hilly landscapes. Because of these benefits, Nepal possesses significant hydropower potential (Shrestha, 2019). Hydropower has evolved into the cornerstone of the national electricity generation framework as Nepal enhances its infrastructure and increases domestic electricity consumption, alongside exporting electricity internationally (Nepal Electricity Authority, 2022). Nevertheless, hydropower initiatives in Nepal face an estimated array of risks stemming from issues linked to geography, climate, and infrastructure. Natural disasters frequently impact hydropower initiatives like floods, earthquakes, landslides, and glacial lake outburst floods (GLOF), and these catastrophic occurrences significantly influence ongoing construction or the functioning of existing facilities (Bhattarai & Joshi, 2020). Consequently, hydropower insurance is emerging as an essential financial tool for mitigating these risks and safeguarding investor assets. The policies offer a financial cushion against unexpected incidents, enabling developers, contractors, investors, and operators to persist with their projects while sustaining economic stability amid challenges (Nepal Insurance Authority, 2023)

Different insurance policies are attached to the hydropower construction portfolio to meet the unique risks of the hydropower sector throughout Nepal. All Risk (CAR) for construction damage to civil works and construction materials used on the project site, as well as on-site equipment and within the project site for third-party liability while they are constructing electric power-producing facilities, are relevant forms of insurance during the construction phase of a hydropower producing facility. Due to the difficult geographic terrain of Nepal and the occurrence of natural disasters, CAR insurance is an important and often-required form of insurance by lenders and regulators (Nepal Hydropower Association, 2021). In addition to CAR insurance, Erection All Risk (EAR) insurance is a common type of insurance that is provided with CAR insurance. EAR insurance converts the risk of loss to electromechanical components used in electrical power generation (such as turbines and generators) to conduct due diligence for the electromechanical components being used to produce electrical power from hydropower.

During the operation phase of hydropower projects, it is critical to have Property Insurance in place for the physical asset, which could include but are not limited to: Powerhouses, Control Rooms, Substations and Auxiliary Infrastructure that may be damaged due to a Fire, Flood, Earthquake or numerous other hazards. Machinery Breakdown (MB) Insurance may be used to cover if critical equipment fails while it is in operation. Loss of Profit (LOP) and Machinery Loss of Profit (MLOP) Insurance cover an operator's loss of income due to interruptions caused by insured events or equipment failure. Although LOP and MLOP can be extremely beneficial, they are not often purchased by operators. Due to the high cost of premiums and complicated underwriting requirements, both products do not have as much market penetration as would be expected (Khadka,2022).

Some other additional insurance products include transit Insurance which covers equipment while in transit from the manufacturer to the Operator; Third Party Liability Insurance which covers damages to others. While these insurance products and their usage continue to evolve in Nepal, the hydropower sector still has many challenges. Challenges include but are not limited to slow payment of claims, limited amount of domestic reinsurance available, not enough usage of specialty coverage, not enough coverage from climate change impacts. Additionally, insurance products are occasionally perceived merely as a regulatory requirement rather than a proactive instrument for managing risk. To bridge the divides between insurance offerings and the hydropower sector in Nepal, there remains

a persistent requirement for enhanced product design, more effective data-driven risk evaluation, and greater collaboration among insurers, project developers, regulators, and international partners (Sharma & Thapa, 2023). In conclusion, hydropower insurance in Nepal is essential for promoting the sustainable development of the energy sector by reducing financial risks. As the hydropower sector grows and evolves, the necessity for an organized and adaptive insurance system becomes increasingly vital for guaranteeing enduring resilience and investment protection

## **1.2 Statement of the Problem**

Hydropower insurance in Nepal is coming under increasing scrutiny as limitations in existing policies and practices become more apparent. While these insurances are broadly defined as general property damage insurances, there is an increasing necessity for specialized insurance products that are specific to the unique risks posed by hydropower projects, as current policies do not adequately cover these risk exposures. As a result, there is growing need for specialized insurance products that better reflects the technical, financial and environmental realities of hydropower sector. Several key stakeholders including project developers, insurers and industry associations have identified several issues to be addressed for effective risk coverage and long-term project sustainability (Nepal Insurance Authority, 2023).

### **a. Inadequate Coverage by Current Insurance policies**

Existing insurance products do not sufficiently cover all hydropower-specific risks, such as turbine and/or transmission equipment damage, third-party liability, and extended periods of loss of operational income which leaves developers exposed to substantial financial risk.

### **b. Delay in Claim Settlement Process**

The timeframe associated with claims being settled can take anywhere from 6 months to 1 year from the date of submission leading to disruption of cash flow, delay in recovery efforts thereby affecting overall project viability.

### **c. Minimum Premium Requirement Provisions**

The Independent Power Producers' Association Nepal (IPPAN) has raised concern regarding minimum tariff rates in hydropower insurance policies arguing that it has led to higher bargaining issues and costs.

### **d. Insurance considered more as Mere Requirement**

Insurance is generally considered by some stakeholders as a tool to fulfill loan requirements or Power Purchase Agreement (PPA) procedures, rather than being a strategic tool for comprehensive risk management.

### **e. Reinsurance Issues**

Reinsurers are more reluctant to reinsure Nepali hydropower projects, leading to additional challenges and limiting the availability of adequate insurance coverage.

### **f. Increasing Risk from Climate Change Impacts**

Since Nepal is highly exposed to climate-related hazards like glacial lake outburst floods (GLOFs), flash floods, and landslides, it has significantly increased uncertainty and insurability for hydropower projects.

### **g. Limited Historical Data and Poor Risk Profiling**

Insurers and reinsurers cannot accurately price or underwrite hydropower risks because there is insufficient historical loss data and there are very few risk assessments specific to individual projects.

## **h. Limited capacity of Domestic Reinsurers**

Domestic Reinsurers are unwilling to provide coverage as they do not have much capacity, especially for high-risk hydropower projects.

All these challenges highlight the urgent need for change in Nepal's hydropower insurance system, because without dependable and reasonably priced coverage for risks, the financial viability of hydropower development, as well as its operational viability, will be jeopardized.

### **1.3 Objectives of the Study**

The primary objective of the study is to assess the current state of hydropower insurance in Nepal. The study focuses on providing insights into how insurance mechanisms can be strengthened to support sustainable hydropower development in Nepal. The specific objectives of the study are as follows:

- To determine the major issues and limitations of hydropower insurance in Nepal.
- To analyze the recent trends in premium collection and claim settlements associated with hydropower projects over recent years.
- To recommend practical measures and appropriate solutions to improve the effectiveness and efficiency of hydropower insurance in Nepal.

### **1.4 Research Questions**

Corresponding to the objectives above, the study seeks to answer the following research questions:

1. What are the major issues and limitations hydropower insurance sector in Nepal?
2. What has been the trend in premium collection and claim settlement in hydropower insurance and how it has evolved in recent years?
3. What strategies can be recommended to overcome the existing challenges and improve the overall performance of hydropower insurance in Nepal?

### **1.5 Limitations of the study**

While this study aims to provide insights into the current state of hydropower insurance in Nepal, several limitations should be acknowledged:

#### **1. Timeframe Constraint**

The offsite analysis is limited to data from the last five fiscal years. As such, long-term trends or historical developments beyond this period are not considered. The on-site analysis is based on a sample of paid claims only and does not fully capture unresolved, disputed, or litigated claims.

#### **2. Data Source Dependence**

The study relies solely on data provided by non-life insurance companies operating in Nepal. The accuracy and completeness of findings are therefore dependent on the reliability and transparency of these sources.

#### **3. Incomplete Portfolio Representation**

Some insurance companies included in the study do not have business in certain segments of the hydropower insurance portfolio. This may result in partial insights into specific insurance categories within the sector.

#### **4. Climate change Impact**

The study does not explicitly model future climate change impacts or projected escalation of hydrometeorological risks.

# Methodology of the study

This chapter highlights the approach used to examine the state of hydropower insurance in Nepal.

The study has been carried out in two phases i.e. Offsite analysis of premiums, claims, loss ratios, and portfolio trends over the past five fiscal years (2076/77 to 2080/81) and on-site analysis that includes physical inspection of hydropower claim files maintained by eight non-life insurers of Nepal. This two-phase analysis has helped in providing a comprehensive review of operational gaps in hydropower sector of Nepal.

## 2.1 Research Design

This study has adopted a descriptive and analytical research approach to determine the current status and challenges of hydropower insurance sector in Nepal considering the premiums, claims, loss ratios under different portfolio of hydropower insurance. a

## 2.2 Population and Sample

The population of the study includes all the insurance companies of Nepal. The study is carried out in two phases that includes off-site supervision and on-site inspection. The sample for off-site supervision is 14 non-life insurance companies and on-site inspection is 8 non-life insurers. Purposive sampling techniques have been used to select eight non-life insurers based on their exposure to significant hydropower risks. The eight insurers include: IGI Prudential, Neco Insurance, NLG Insurance, Oriental Insurance, Prabhu Insurance, Rastriya Beema Company Limited, Shikhar Insurance, and Siddhartha Premier Insurance.

## 2.3 Data Collection

Primary and Secondary sources of data were used for data collection purpose. The primary data were collected from non-life insurance companies operating in Nepal. Specifically, the study has been carried out in two phases as explained below:

- Phase I (Off-site Data Collection): Review of insurer-submitted data on premiums, claims, loss ratios, and portfolio trends for hydropower insurance over five fiscal years i.e. FY 2076/77 to FY 2080/81 (according to the Nepali calendar).
- Phase II (On-site Data collection): Physical inspection of hydropower claim files maintained by eight non-life insurers, namely IGI Prudential, Neco Insurance, NLG Insurance, Oriental Insurance, Prabhu Insurance, Rastriya Beema Company Limited, Shikhar Insurance, and Siddhartha Premier Insurance. A structured data collection template was used to capture claim timelines, loss characteristics, sum insured, and reinsurance arrangements. The analysis is based on 121 paid claims data.

The secondary sources of data include annual report of Nepal Insurance Authority, financial statement of non-life insurers, directives, circulars issued by Nepal Insurance Authority and other information through discussion with other industry stakeholders.

## 2.4 Data Analysis

Descriptive statistics are used to analyze the collected data. The tables and charts are presented to reflect the trends in premiums and claims.

## Data Analysis & presentation

This chapter highlights the comprehensive analysis of data collected in two phases segregated as part A and part B. Part A of this chapter provides the analysis and review of offsite collected data regarding premiums, claims, loss ratios, and portfolio trends for hydropower insurance over five fiscal years i.e. FY 2076/77 to FY 2080/81 (according to the Nepali calendar). Part B of this chapter provides the analysis of physical inspection of hydropower claim files maintained by eight non-life insurers, namely IGI Prudential, Neco Insurance, NLG Insurance, Oriental Insurance, Prabhu Insurance, Rastriya Beema Company Limited, Shikhar Insurance, and Siddhartha Premier Insurance.

### Part A

#### 3.1 Overview of Hydropower Insurance Market

##### 3.1.1 Policies, Premium and Sum Insured Status of Hydropower Policies

The following table highlights the number of hydropower insurance policies, the premium amounts collected, and the total sum insured amount across the fiscal years 2077/78 to 2081/82.

**Table 1**

*Policies, Premium and Sum Insured Status of Hydropower Policies*

Fiscal Year	Number of Policies	Premium amount	Sum Insured
2077/78	505	51.30	17,074.44
2078/79	598	157.29	36,712.33
2079/80	886	171.73	41,134.26
2080/81	768	183.12	41,697.27
2081/82	708	211.87	42,845.14

*\*Amount in NPR Crore*

The above table indicates that there has been substantial increase in both the premiums and sum insured from fiscal year 2077/78 to 2081/82 highlighting the increasing scope and risks in hydropower projects. The premium has increased by more than fourfold i.e. from 51.30 crore in 2077/78 to NPR 211.87 crore in 2081/82. The sum assured has also increased steadily from NPR 17,074.44 crore to NPR 42,845.14 crore. The result indicates that insurers are adjusting rates response to higher financial exposure and perceived risk as there has been sharp increase in premiums related to growth in insured value. However, the policies number reached peak in 2079/80 at 886 but then declined to 708 in 2081/82, which may be due to shift towards fewer, larger policies covering more extensive hydropower assets. These trends emphasize that specialized insurance products are needed to assure the growing risks and complexity of hydropower projects.

##### 3.1.2 Claim Details of Hydropower Insurance

The following table highlights the claim details of the hydropower insurance in the fiscal years 2077/78 to 2081/82.

**Table 2***Claim Details of Hydropower Insurance*

Fiscal Year	Total Claim Number	Total Claim Amount	Claim Paid Number	Claim Paid Amount	Claim O/S Number	Claim O/S Amount	Amount Recovered from Reinsurance
2077/78	170	207.57	109	101.13	57	63.31	81.83
2078/79	190	254.40	165	151.89	80	77.98	52.74
2079/80	154	297.95	126	128.21	75	142.49	87.35
2080/81	142	114.53	109	84.07	103	136.20	56.70
2081/82	157	270.60	110	99.86	124	216.26	122.69

*\*Amount in NPR Crore*

The above table shows a lot of variability from year to year both in terms of number of claims and amount of claim paid. In Fiscal Year 2077/78, there were 170 claims with total amounts of NPR 207.57 crore and 109 claims paid for a total paid amount of NPR 101.13 crore. In the next few years, number of claims paid each year has subsequently increased peaking in Fiscal Year 2079/80 at 126 claims paid (totaling NPR 128.21 crore). These increases in number of claims that are being paid have also been accompanied by increases in outstanding (O/S) claims. There were 57 outstanding claims of NPR 63.31 crore in FY 2077/78 and there were 124 outstanding claims in FY 2081/82 indicating that insurance industry has been experiencing in high number of unsettled claims. Variability exists for the total amount that has been recovered from reinsurance. During FY 2081/82 the total amount received from reinsurance was the highest at NPR 122.69 crore indicating a positive effect on the way claims have been managed. In FY 2079/80 when there were 126 total claims paid, the amount that was outstanding at that time was greater than the amount that had been paid. Overall, the data indicate an increasing number of claims along with an increasing amount of claims that are outstanding, which highlights a challenge for both hydropower developers and insurers in respect to processing claims in a timely manner.

### 3.1.3 Claim, Claim settlement and Outstanding Ratio

The following table highlights the claim, claim settlement and outstanding ratio details of hydropower insurance across the fiscal years 2077/78 to 2081/82.

**Table 3***Claim, Claim settlement and O/S Ratio*

Fiscal Year	Claim ratio	Claim settlement Ratio	O/S Ratio
2077/78	404.65	197.14	123.42
2078/79	161.73	96.56	49.58
2079/80	173.50	74.66	82.98
2080/81	62.55	45.91	74.38
2081/82	127.72	47.13	102.07

*Note. claim ratio, settlement ratio and O/S ratio calculated on the basis of premium collected*

The above table highlights the claim ratio showing volatility and inefficiencies in claim management process. The results indicate that the claim ratio which is calculated as total claim in relation to premiums collected was as peak ar 404.65% in 2077/78 and dropped to 62.55% in 2080/81 and again elevated to 127.72% in FY 2081/82. This shows that claims exceeded the amount of premium collected in that year leading to high risk to the insurers. The data on hydropower insurance claim ratios over five fiscal years highlights notable volatility and underlying inefficiencies in the claims management process. Claim settlement ratio given in above table shows the portion of claim actually paid against collected premium. The claim settlement ratio has also declined from 197.14% in FY 2077/78 to 47.13% in FY 2081/82 indicating that insurers have settled only smaller portion of claim in relation to growing premium. However, volatility has been seen mainly in the outstanding claim ratio as it was 123.42% in FY 2077/78 and again peaked to 102.07% in FY 2081/82 indicating backlog of unsettled claim by insurers. The increasing outstanding ratio shows operational challenges within insurers thereby leading to delays in claim processing. Transparent claim handling mechanisms are required to ensure higher settlement efficiency and trust as well as financial sustainability in hydropower insurance sector.

### 3.1.4 Gross and Net Claim Ratio

The following table highlights the gross and net claim ratio of hydropower industry across the fiscal years 2077/78 to FY 2081/82.

**Table 4**

*Gross and Net Claim ratio*

FY	Incurred Claim Amount	Claim Paid Amount	Claim O/S Amount	Amount Recovered from Reinsurance	Gross Claim Ratio	Net Claim Ratio
2077/78	164.44	101.13	63.31	81.83	321%	161%
2078/79	229.87	151.89	77.98	52.74	146%	113%
2079/80	270.71	128.21	142.49	87.35	158%	107%
2080/81	220.27	84.07	136.20	56.70	120%	89%
2081/82	316.12	99.86	216.26	122.69	149%	91%
<b>Grand Total</b>	<b>1,201.41</b>	<b>565.16</b>	<b>636.25</b>	<b>401.32</b>	<b>179%</b>	<b>112%</b>

*\*Amount in NPR Crore*

The above table highlights the claim ratios over the fiscal years. Assuming insurer's average expense ratio to be 5%, the average gross combined ratio for hydropower line of business is approximately 146 % and the average net combined ratio for hydropower line of business is approximately 108%. (Note: FY 2077/78 is ignored because it includes pre-MTR data and FY 2081/82 has 9 months data only).

In simple terms, this implies that insurers underwriting hydropower business are on average losing around NPR 8.0 per fiscal year for every NPR 100 in premium after reinsurance recoverable. Hence, cumulative unsustainable losses threaten Nepal's hydro insurance market stability and may bring insurer's reinsurance capacity at risk. Some possible solutions could be Three-year phased MTR increase, geographic risk differentiation and De-tariffication for mega-projects.

### 3.2 Market Analysis

This section highlights hydropower portfolio-wise growth and exposure across the fiscal years 2077/78 to 2081/82.

### 3.2.1 Number of Policies Issued

The following table highlights the number of policies issued under different portfolio of hydropower insurance details across the fiscal years 2077/78 to 2081/82.

**Table 5**

*Number of Policies Issued*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average No. of issued Policies in a year
Contractor All Risk (CAR)	63	91	249	89	96	118
Erection All Risk (EAR)	35	35	32	39	60	40
Loss of Profit	69	86	148	159	123	117
Machinery Breakdown	34	44	57	64	51	50
Machinery Loss of Profit	10	12	18	20	24	17
Others	122	154	154	118	101	130
Property Insurance	172	176	228	279	253	222
<b>Grand Total</b>	505	598	886	768	708	693
<b>Average No. of issued Policies</b>	72	85	127	110	101	

The above table highlights the market engagement and coverage of hydropower insurance in Nepal. High volatility can be seen in Contractor All Risk (CAR) portfolio where highest number of issued policies was 249 in FY 2079/80, however, the average number of policies per year is 118. This indicates the significance of CAR policy during the construction phase. The data on EAR policies show stable figures having 40 policies annually, indicating a niche but steady demand in hydropower sector. The loss of profit portfolio shows the continuous growth from 69 policies in 2077/78 to 123 policies in FY 2081/82 having average of 117 policies in a year. This indicates that there has been increasing awareness and up taking of insurance policies for coverage against loss of revenues that may be due to project disruptions and delays. Machinery Breakdown Policies showed gradual increase every year with average of 50 policies per year. Similarly, machinery loss of profit also shows similar trend with average of 17 policies per year indicating increasing attention towards mechanical risk coverage. The other category that consists of miscellaneous insurance showed higher average of 130 policies per year which may be due to consolidation in this category. Meanwhile, Property Insurance has the highest average of policies issued with 222 policies per year indicating that there is need for protection of physical assets in hydropower projects.

Considering the overall trend, it can be summarized that the hydropower insurance market is dynamic with strong engagement of insurance but also has areas for growth and penetration in other portfolio categories.

### 3.2.2 Gross Premium Collection

The following table highlights the portfolio wise gross premium collection across the fiscal years 2077/78 to 2081/82.

**Table 6***Gross Premium Collection*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average amount of gross premium in a year
Contractor All Risk (CAR)	20.49	55.32	46.87	40.84	73.56	47.42
Erection All Risk (EAR)	10.77	26.27	10.84	16.92	23.86	17.73
Loss of Profit	2.92	11.29	22.27	21.83	14.90	14.64
Machinery Breakdown	0.75	7.00	14.10	15.65	13.37	10.17
Machinery Loss of Profit	0.21	2.23	4.57	5.01	4.75	3.35
Others	0.77	0.36	1.72	1.63	1.12	1.12
Property Insurance	15.39	54.82	71.37	81.24	80.31	60.62
<b>Grand Total</b>	<b>51.30</b>	<b>157.29</b>	<b>171.73</b>	<b>183.12</b>	<b>211.87</b>	<b>155.06</b>
<b>Average amount of Gross premium</b>	<b>7.33</b>	<b>22.47</b>	<b>24.53</b>	<b>26.16</b>	<b>30.27</b>	

*\*Amount in NPR Crore*

The above table regarding the gross premium collection data highlights that there has been increasing trend in premium inflows indicating increased level of risk exposure and growth. The total gross premium increased from NPR 51.3 crore in 2077/78 to NPR 211.87 crore in FY 2081/82 with annual average premium amounting to NPR 155.06 crore. The Contractor All Risk (CAR) portfolio consistently holds the largest share of premiums. The property insurance holds the second highest average premium of NPR 60.62 crore showing growing protection need for physical assets in hydropower projects. The trend in Erection All Risk (EAR) portfolio showed variable premium growth indicating steady market interest. Significant growth can be seen in Loss of Profit and Machinery portfolio with average of NPR 14.64 crore and NPR 10.17 crore respectively. This reflects increasing awareness of machinery risks. In overall, there has been trend of increasing premium collection in most of the portfolio showing the growing scope and scale of hydropower insurance in Nepal. However, proper risk management is essential to align with increasing risk profile and demand.

**3.2.3 Claim Ratio**

The following table highlights the hydropower insurance's claim ratio details under different portfolio across the fiscal years 2077/78 to 2081/82.

**Table 7***Claim Ratio*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82
Contractor All Risk (CAR)	316.94	100.52	87.12	112.70	27.12
Erection All Risk (EAR)	264.50	44.95	190.40	43.36	25.63
Loss of Profit	1,153.03	332.77	228.33	140.58	503.15
Machinery Breakdown	148.57	74.20	12.21	24.38	16.88
Machinery Loss of Profit	856.22	31.01	148.94	-	0.23
Others	35.91	24.58	5.35	60.17	739.74
Property Insurance	502.39	261.66	248.06	31.62	198.04
<b>Grand Total</b>	<b>404.65</b>	<b>161.73</b>	<b>173.50</b>	<b>62.55</b>	<b>127.72</b>

The above table regarding claim ratio highlights variations in claims indicating diverse risk exposures for each category of hydropower insurance. Loss of Profit portfolio showed exceptionally high claim ratio of 1153.03% in FY 2077/78 indicating substantial mismatch in premium collection and claims made. Similar trend can be observed in Machinery loss of profit portfolio with 856.22% claim ratio and Contractor All Risk (CAR) portfolio with 316.94%. However, the claim ratio has decreased in other subsequent years.

Contractor All Risk (CAR) and Erection All Risk (EAR) showed similar declines, but Loss of Profit remained a consistent source of high claims, signaling persistent risks in project-related delays or operational issues. Lower claim ratios have been observed in the Machinery Breakdown and Machinery Loss of Profit portfolios indicating low frequency of claim or better claim settlement in these portfolios. However, the others portfolio that includes miscellaneous insurance showed high increment in 2081/82 with a claim ratio of 739.74% which may be due to some unusual events or claims in that year.

The claim ratio for property insurance showed sharp decrement of 502.39% in 2077/78 to 198.04% in 2081/82 indicating better claim management in recent years. The dynamic trend of the claim ratio under different portfolios suggests the need for tailored insurance products and risk management strategies to address the risk of hydropower sector.

### 3.2.4 Sum Assured

The following table highlights the sum assured under different portfolio across the fiscal years 2077/78 to 2081/82.

**Table 8**

*Sum Assured*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average Sum assured in a year
Contractor All Risk (CAR)	6,974.69	12,216.75	8,456.45	4,435.00	9,165.60	8,249.70
Erection All Risk (EAR)	952.17	3,158.52	1,184.65	1,496.22	2,231.36	1,804.58
Loss of Profit	963.22	1,765.21	3,295.70	4,447.39	3,292.24	2,752.75
Machinery Breakdown	298.74	827.37	1,314.67	1,387.86	1,251.60	1,016.05
Machinery Loss of Profit	86.19	307.04	502.64	501.73	668.16	413.15
Others	245.97	81.34	547.09	94.98	64.00	206.68
Property Insurance	7,553.46	18,356.11	25,833.05	29,334.09	26,172.18	21,449.78
<b>Grand Total</b>	<b>17,074.44</b>	<b>36,712.33</b>	<b>41,134.26</b>	<b>41,697.27</b>	<b>42,845.14</b>	<b>35,892.69</b>
<b>Average amount of sum assured</b>	<b>2,439.21</b>	<b>5,244.62</b>	<b>5,876.32</b>	<b>5,956.75</b>	<b>6,120.73</b>	

The above table reflects steady and substantial increment in sum assured of hydropower policies indicating growing scale of the project and asset values. The total sum assured increased from

NPR 17,074.44 crore in 2077/78 to NPR 42,845.14 crore in 2081/82 with an average of NPR 35,892.69 crore annually. This shows that insurance is expanding coverage and increased asset valuation in the hydropower sector. The higher sum assured can be observed in Property Insurance portfolio with

an average of NPR 21,449.78 crore per year. This trend shows that insuring physical assets in hydropower plants has become quite essential. The Contractor All Risk (CAR) portfolio has the second highest sum assured with average sum assured of NPR 8,249.70 crore although it shows some volatility with a peak of NPR 12,216.75 crore in 2078/79 and decline to NPR 4,435 crore in 2080/81.

Other portfolios also show increasing trend reflecting an expanding hydropower sector with increased insurance penetration and asset values.

### 3.2.5 Recovery from Re-insurance

The following table highlights the recovery from re-insurance under different portfolios across the fiscal years 2077/78 to 2081/82.

**Table 9**

*Recovery from Re-insurance*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average amount of recovery from reinsurance in a year
Contractor All Risk (CAR)	28.48	6.00	16.41	11.62	4.82	13.47
Erection All Risk (EAR)	4.51	1.44	8.11	10.42	9.21	6.74
Loss of Profit	20.00	17.52	17.40	18.20	35.70	21.76
Machinery Breakdown	0.14	0.36	0.84	2.83	0.88	1.01
Machinery Loss of Profit	1.30	0.19	0.38	0.24	0.00	0.42
Others	-	0.00	0.01	0.02	0.38	0.10
Property Insurance	27.39	27.23	44.21	13.37	71.70	36.78
<b>Grand Total</b>	<b>81.83</b>	<b>52.74</b>	<b>87.35</b>	<b>56.70</b>	<b>122.69</b>	<b>80.26</b>
<b>Average amount of recovery from reinsurance</b>	<b>11.69</b>	<b>7.53</b>	<b>12.48</b>	<b>8.10</b>	<b>17.53</b>	

The above table shows high level of fluctuations in recoveries across different fiscal years under different portfolios. Notable fluctuations can be observed in the Contractor All Risk (CAR) portfolio with amount of NPR 28.48 crore in 2077/78 and NPR 4.82 crore in 2081/82 with an average of NPR 13.47 crore annually. This may be due to reduction in either the frequency of claims or the amount recovered from reinsurance indicating less retention support from reinsurer.

The Loss of Profit portfolio and Property Insurance recorded significant recoveries from reinsurance, with an average of NPR 21.6 crore and NPR 36.78 per year. This indicates that reinsurance plays a major role in mitigating the risks related to income loss claims, property damage especially in large hydropower projects where the insured values are high.

In overall, total recovery from reinsurance fluctuated from NPR 81.83 crore in 2077/78 to NPR 122.69 crore in 2081/82 with an average of NPR 80.26 crore annually. This trend suggests that reinsurance has a critical role in managing the hydropower risks.

### 3.3 Portfolio Specific Performance

#### 3.3.1 Number of Intimated Gross Claim

The following table highlights the number of Intimated Gross Claim under different portfolios across the fiscal years 2077/78 to 2081/82.

**Table 10**

*Number of Intimated Gross Claim*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average intimated gross claim in a year
Contractor All Risk (CAR)	45	63	37	30	26	40
Erection All Risk (EAR)	18	17	11	13	13	14
Loss of Profit	13	18	13	11	15	14
Machinery Breakdown	7	18	15	8	9	11
Machinery Loss of Profit	5	2	3	-	2	2
Others	10	10	12	25	24	16
Property Insurance	72	62	63	55	68	64
Grand Total	170	190	154	142	157	163
<b>Average number of intimated gross claim</b>	<b>24</b>	<b>27</b>	<b>22</b>	<b>20</b>	<b>22</b>	

The above table indicates some key trends in hydropower insurance in Nepal. There has been decline in number of claims from 45 in 2077/78 to 26 in 2081/82, with an average of 40 claims per year in the Contractor All Risk (CAR) portfolio indicating a reduction in construction-related risks over time. However, The Erection All Risk (EAR) portfolio showed stability in claims with claims ranging between 18 and 13 over the five fiscal year with an average of 14 claims annually, indicating consistent risks associated with the erection phase of projects. The Loss of Profit portfolio and machinery breakdown portfolio showed fluctuations indicating concerns regarding machinery failure and income losses due to project delays. The Machinery Loss of Profit portfolio recorded lowest claims with an average of 2 claims per year. However, the Property Insurance portfolio consistently accounted for the highest number of claims with an average of 64 claims per year. This shows high level of risks associated with property damage in hydropower sector. Although the total number of claims slightly decreased from 170 in 2077/78 to 157 in 2081/82, it highlights risks in construction and property related coverage reflecting effective risk management to emphasize the need of hydropower sector.

#### 3.3.2 Amount of Intimated Gross Claim

The following table highlights the intimated gross claim amount under different portfolio across the fiscal years 2077/78 to 2081/82.

**Table 11***Amount of Intimated Gross Claim*

<b>Portfolio</b>	<b>2077/78</b>	<b>2078/79</b>	<b>2079/80</b>	<b>2080/81</b>	<b>2081/82</b>	<b>Average amount of intimated gross claim in a year</b>
Contractor All Risk (CAR)	64.94	55.61	40.83	46.03	19.95	45.47
Erection All Risk (EAR)	28.49	11.81	20.64	7.33	6.11	14.88
Loss of Profit	33.61	37.56	50.84	30.69	74.95	45.53
Machinery Breakdown	1.11	5.19	1.72	3.81	2.26	2.82
Machinery Loss of Profit	1.81	0.69	6.80	-	0.01	1.86
Others	0.28	0.09	0.09	0.98	8.28	1.94
Property Insurance	77.33	143.44	177.03	25.69	159.04	116.51
Grand Total	207.57	254.40	297.95	114.53	270.60	229.01
<b>Average amount of intimated gross claim</b>	<b>29.65</b>	<b>36.34</b>	<b>42.56</b>	<b>16.36</b>	<b>38.66</b>	

The above table indicates that the Contractor All Risk (CAR) portfolio had a declining trend in claim amounts with NPR 64.94 crore in 2077/78 and NPR 19.95 crore in 2081/82, having an average annual claim amount of NPR 45.47 crore. This indicates decline in construction related claims. Similarly, the Erection All Risk (EAR) portfolio also showed a declining trend from NPR 28.49 crore to NPR 6.11 crore with an average of NPR 14.88 crore per annum indicating few erection phase related incidents over the years. The Loss of Profit portfolio showed consistent high claim amounts with an average of NPR 45.53 crore annually, underscoring the significant financial impact of operational disruptions while the Machinery Breakdown portfolio maintained relatively low claim amount having an average of NPR 2.82 crore, indicating lower frequency or severity of machinery damage related claims. Machinery Loss of Profit reported minimal amount of claims, while Others portfolio reported an increase to NPR 8.28 crore in 2081/82, averaging to NPR 1.94 crore, showing risks in miscellaneous category. The highest amount of claims has been seen in the Property Insurance portfolio with an average of NPR 116.51 crore annually which reflects high-value claims in hydropower projects related to property damage. The overall ratio for total intimated gross claim amount shows fluctuation from NPR 207.57 crore in 2077/78 to decrease upto NPR 114.53 crore in 2080/81 and increasing again to NPR 270.60 crore in 2081/82 with an average of NPR 229.01 crore per year. The fluctuation in the claim data suggests that some portfolios have reduced claims while Property Insurance and Loss of profit policies face significant financial risks emphasizing the need for adequate coverage.

### 3.3.3 Number of Gross Claim Paid

The following table highlights the number of gross claims paid under different portfolios across the fiscal years 2077/78 to 2081/82.

**Table 12***Number of Gross Claim Paid*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average number of gross claim paid in a year
Contractor All Risk (CAR)	23	42	37	25	24	30
Erection All Risk (EAR)	11	17	8	19	11	13
Loss of Profit	11	16	8	10	11	11
Machinery Breakdown	8	15	10	8	7	10
Machinery Loss of Profit	5	5	1	1	2	3
Others	4	6	11	10	15	9
Property Insurance	47	64	51	36	40	48
Grand Total	109	165	126	109	110	124
<b>Average number of gross claim paid</b>	<b>16</b>	<b>24</b>	<b>18</b>	<b>16</b>	<b>16</b>	

The above table shows the number of gross claims paid under different portfolios whereas the Contractor All Risk (CAR) portfolio being the second highest with average of 30 claims paid per year, indicates a stable but ongoing demand for construction-related coverage. The Erection All Risk (EAR) portfolio, Loss of Profit Portfolio and machinery breakdown Portfolio had steady and modest claims paid while Machinery Loss of Profit and others category reported fewer number of gross claims paid. Highest number of claims paid has been reported in Property Insurance Portfolio with highest claims in 2078/79 and an average of 48 claims per annum. This shows high risk in physical property of hydropower plants. The total number of claims paid under all portfolios showed a general decrease from an average of 124 claims per year, suggesting that the frequency of claims remains significant, especially for Property Insurance and Contractor All Risk portfolio.

### 3.3.4 Amount of Gross Claim Paid

The following table highlights the amount of gross claim paid under different portfolios across the fiscal years 2077/78 to 2081/82.

**Table 13***Amount of Gross Claim Paid*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average amount of gross claim Paid in a year
Contractor All Risk (CAR)	29.09	10.55	18.65	16.67	10.47	17.09
Erection All Risk (EAR)	5.60	2.05	8.21	10.60	11.19	7.53
Loss of Profit	22.69	33.44	25.03	33.57	13.94	25.74
Machinery Breakdown	1.00	3.66	0.87	3.00	0.98	1.90
Machinery Loss of Profit	1.31	0.98	0.39	0.24	0.00	0.59
Others	0.19	0.02	0.02	0.15	0.38	0.15
Property Insurance	41.24	101.18	75.05	19.84	62.90	60.04
Grand Total	101.13	151.89	128.21	84.07	99.86	113.03
<b>Average amount of gross claim paid</b>	<b>14.45</b>	<b>21.70</b>	<b>18.32</b>	<b>12.01</b>	<b>14.27</b>	

The above table reflects the fluctuations and trends in claim settlement on amount of gross claims paid across different portfolios. The Contractor All Risk (CAR) claims reported a notable decrease in the amount paid, with an average of NPR 17.09 crore annually indicating a reduction in large-scale construction-related claims which may be due to effective risk management or fewer major incidents during the construction phases. The Erection All Risk (EAR) portfolio showed fluctuations in paid amounts with an average of NPR 7.53 crore per year, reflecting low-level risk in the erection phase. Similarly, the Loss of Profit portfolio reported high fluctuations in the amount of claims paid, being as high as NPR 33.57 crore in 2080/81, before dropping to NPR 13.94 crore in 2081/82, and averaging to NPR 25.74 crore per year which suggests a major financial impact from delays or operational issues in specific years. The Machinery Breakdown portfolio showed relatively smaller and stable claim amounts and the machinery loss of profit portfolio and others category showed very low claims paid. The Property Insurance portfolio consistently accounted for the largest share of claims paid, with an average of NPR 60.04 crore per year highlighting the high risks associated with physical damage to hydropower plants. The overall gross claim paid amount showed volatility from NPR 101.13 crore in 2077/78 to NPR 99.86 crore in 2081/82 with an average NPR 113.03 crore per year, showing consistent levels of claim settlement across portfolios. Therefore, CAR and Property Insurance had the highest share for claims paid, there is also noticeable reduction in large scale claims particularly for machinery and construction related issues. These trends show the emerging risks in hydropower projects emphasizing the need for focused risk management strategies in hydropower insurance, especially for property and construction phases.

### 3.3.5 Number of Outstanding Gross Claim

The following table highlights the number of outstanding gross claims under different portfolio across the fiscal years 2077/78 to 2081/82.

**Table 14**

*Number of Outstanding Gross Claim*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average number of O/S gross claim in a year
Contractor All Risk (CAR)	12	37	17	15	23	21
Erection All Risk (EAR)	9	10	9	8	11	9
Loss of Profit	2	3	7	10	8	6
Machinery Breakdown	1	5	7	8	6	5
Machinery Loss of Profit	3	1	2	1	1	2
Others	9	12	10	26	33	18
Property Insurance	21	12	23	35	42	27
Grand Total	57	80	75	103	124	88
<b>Average number of O/S gross claim</b>	<b>8</b>	<b>11</b>	<b>11</b>	<b>15</b>	<b>18</b>	

The above table provides insights into the accumulation and unresolved claims in the hydropower sector. Significant fluctuations have been reported in the Contractor All Risk (CAR) portfolio with number of outstanding claims reported as 12 in 2077/78 to a highest of 37 in 2078/79 and averaging 21 claims annually. The increase in outstanding claims to 37 in 2078/79 suggests that there might have been delays in resolving construction-related claims, however, in later years, better resolution can be observed from the data. The Erection All Risk (EAR) portfolio reported stable outstanding claims, with an average of 9

claims per year reflecting manageable issues in the erection phase of hydropower projects. The Loss of Profit portfolio and the Machinery Breakdown portfolio exhibited an increase in outstanding claims over time, indicating growing challenges in settling claims related to income loss due to operational disruptions and machinery failures over time. .

Machinery Loss of Profit reported low but stable claims while the Others portfolio showed a significant rise in outstanding claims, with an average of 18 claims per year. This increment could indicate emergence of non-traditional risks in hydropower projects. Similarly, Property Insurance reported a consistent increasing trend in outstanding claims, from 21 in 2077/78 to 42 in 2081/82, and an average of 27 claims annually reflecting high risks and complex nature of settling claims related to property damage in hydropower plants.

Overall, the total of outstanding claims increased from 57 in 2077/78 to 124 in 2081/82, with an average of 88 claims per year suggesting that while claim numbers have stabilized in some portfolios, there is still many unsettled and unresolved claims thereby emphasizing the need for timely claim settlement in hydropower portfolio.

### 3.3.6 Amount of Outstanding Gross Claim

The following table highlights the amount of outstanding gross claim under different portfolios across the fiscal years 2077/78 to 2081/82.

**Table 15**

*Amount of Outstanding Gross Claim*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82	Average amount of O/S gross claim in a year
Contractor All Risk (CAR)	10.37	46.45	18.66	34.63	41.31	30.28
Erection All Risk (EAR)	11.23	25.35	11.85	13.76	4.87	13.41
Loss of Profit	4.18	0.93	14.07	37.75	49.23	21.23
Machinery Breakdown	0.01	0.12	0.60	1.77	1.35	0.77
Machinery Loss of Profit	1.02	0.02	6.45	0.02	0.02	1.51
Others	0.80	0.84	0.02	1.70	8.82	2.44
Property Insurance	35.71	4.27	90.84	46.58	110.66	57.61
Grand Total	63.31	77.98	142.49	136.20	216.26	127.25
<b>Average amount of O/S gross claim</b>	<b>9.04</b>	<b>11.14</b>	<b>20.36</b>	<b>19.46</b>	<b>30.89</b>	

The above table highlights the amount of outstanding gross claims (O/S claims) under different portfolios in hydropower insurance. Significant fluctuations have been observed in the Contractor All Risk (CAR) portfolio with a NPR 10.37 crore in 2077/78 to NPR 41.31 crore in 2081/82, and an average of NPR 30.28 crore annually indicating increasing backlog of construction related claims which may be due to issues and disputes in construction phase. In the Erection All Risk (EAR) portfolio, initial rise in outstanding claims, but gradually decline to NPR 4.87 crore in 2081/82, with an average of NPR 13.41 crore annually has been reported suggesting the improvement in settlement of claims in later years which may be due to faster claim resolution process. Substantial volatility has been observed in the Loss of Profit portfolio with outstanding claims increasing from NPR 4.18 crore in 2077/78 to a significant NPR 49.23 crore in 2081/82 with an average of NPR 21.23 crore per year reflecting income loss due to delays or operational disruptions.

For Machinery Breakdown portfolio, there seems to be gradual rise in machinery-related claims that remain unresolved as the outstanding claim amount was NPR 0.01 crore in 2077/78 to NPR 1.35 crore in 2081/82, with an average of NPR 0.77 crore annually. Similarly, the Machinery Loss of Profit portfolio reported had minimal outstanding claims with an average of NPR 1.51 crore annually. Significant increment has been observed in the Others portfolio with an average of NPR 2.44 crore annually reflecting that emerging or miscellaneous risks are creating larger backlogs in timely claim settlements. The largest share of outstanding claims has been consistently reported for the property insurance category, with amounts being highest at NPR 110.66 crore in 2081/82, and an average of NPR 57.61 crore annually. Reflecting high number of unresolved property damage claims in hydropower projects. Overall, the outstanding claims showed the increasing trend particularly in portfolios like Loss of Profit and Property Insurance, indicating growing delay in settling the high-value claims, emphasizing the need for more efficient risk management practices and better claims resolution processes in the hydropower insurance sector of Nepal.

### 3.3.7 Claim Settlement Ratio

The following table highlights the claim settlement ratio under different hydropower portfolios across the fiscal years 2077/78 to 2081/82.

**Table 16**

*Claim Settlement Ratio*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82
Contractor All Risk (CAR)	141.98	19.07	39.79	40.81	14.23
Erection All Risk (EAR)	52.01	7.82	75.77	62.68	46.88
Loss of Profit	778.31	296.25	112.42	153.75	93.59
Machinery Breakdown	134.18	52.28	6.15	19.15	7.33
Machinery Loss of Profit	620.67	43.90	8.59	4.87	0.09
Others	24.19	5.88	1.16	9.00	33.97
Property Insurance	267.94	184.58	105.15	24.42	78.32
<b>Grand Total</b>	<b>197.14</b>	<b>96.56</b>	<b>74.66</b>	<b>45.91</b>	<b>47.13</b>

The above table regarding the claim settlement ratio shows high level of fluctuations in claim handling efficiency, size of claim and potential delay in reinsurance settlements. The industry wide claim-settlement ratio showed a declining trend with 197.14% in FY 2077/78 to 47.13% in FY 2081/82, although there are some minor recoveries in certain years. The trend suggests that claims settlement have not been in pace in relation to increased premium which may be due to stringent verification processes during claim settlement. The loss of profit portfolio reported extremely high settlement ratios in the initial years, especially 778.31% in 2077/78 and 296.25% in 2078/79, but declining to 93.59% in 2081/82, indicating payouts for large claims in initial years and improvement in premium adequacy or fewer incidents in later years. Similarly, Machinery Loss of Profit reported a high settlement ratio of 620.67% in 2077/78, declining to near zero by 2081/82 (0.09%), showing a sharp decline in claim payouts which may be due to lack of claim events. However, lower and more fluctuating claim settlement ratios have been observed in Contractor All Risk (CAR) and Erection All Risk (EAR) portfolios with CAR being highest at 141.98% in 2077/78 but falling to 14.23% by 2081/82, and EAR peaking at 75.77% in 2079/80 before declining to 46.88% indicating better claims management and evaluations over time. The machinery Breakdown settlements reported a similar trend, with 134.18% in 2077/78 reducing to 7.33%

in 2081/82 reflecting smaller paid claims in recent years. Likewise, the Property Insurance segment had claim settlement ratio of 267.94% in 2077/78 and declining to 78.32% in 2081/82, indicating improved underwriting and less catastrophic property loss events. Therefore, the overall trend reflects a maturing insurance market with improved risk selection and possibly tighter claim settlements in hydropower sector.

### 3.3.8 Claim Outstanding Ratio

The following table highlights the claim outstanding ratio under different portfolios across the fiscal years 2077/78 to 2081/82.

**Table 17**

*Claim Outstanding Ratio Under Different Portfolio*

Portfolio	2077/78	2078/79	2079/80	2080/81	2081/82
Contractor All Risk (CAR)	50.63	83.96	39.81	84.79	56.16
Erection All Risk (EAR)	104.23	96.48	109.36	81.31	20.40
Loss of Profit	143.27	8.24	63.19	172.91	330.49
Machinery Breakdown	1.34	1.71	4.28	11.32	10.11
Machinery Loss of Profit	483.08	0.90	141.28	0.40	0.42
Others	103.36	230.20	1.11	104.45	788.60
Property Insurance	231.98	7.79	127.28	57.33	137.80
<b>Grand Total</b>	<b>123.42</b>	<b>49.58</b>	<b>82.98</b>	<b>74.38</b>	<b>102.07</b>

The above table highlights the volatility in claim Outstanding (O/S) ratio in hydropower insurance across different portfolios from FY 2077/78 to 2081/82. The Contractor All Risk (CAR) shows fluctuating trend over the years with 50.63% in 2077/78, reaching highest at 84.79% in 2080/81, and slightly dropping to 56.16%, highlighting the pending claims in this portfolio. Similarly, Erection All Risk (EAR) reported a high outstanding ratio above 80% until 2080/81 but it dropped to 20.40% in 2081/82, implying claim settlement of fewer claims in later years. The Loss of Profit portfolio shows the most alarming trend, increasing from 8.24% in 2078/79 to 330.49% in 2081/82, indicating a significant accumulation of unpaid claims. This may be due to large interruption claims still under assessment or delays in this portfolio. Machinery Breakdown remains relatively stable with low ratios, Machinery Loss of Profit, however, started with an extreme 483.08% in 2077/78 but reported very low ratio as 0.40, likely due to a few large, unsettled claims. Likewise, the Property Insurance portfolio shows inconsistent ratios—231.98% in 2077/78, declining to 7.79% in 2078/79, then increasing again to 137.80% in 2081/82, implying claim delays in large scale property or may be due to catastrophic events. There seems to be declining trend in overall industry ratio initially from 123.42% in 2077/78 to 49.58% in 2078/79, but the ratio increased again in later years, peaking at 102.07% in 2081/82. This shows increasing delays in claim settlements, potentially due to large value of claim or claim complexity, reinsurance processes, or disputes requiring improved underwriting practices, faster claim processing and stronger regulatory oversight.

### 3.3.9 Claim Ratio of Contractor All Risk (CAR) Insurance

The following table highlights the claim ratio of the contractor all risk (car) hydropower insurance portfolio across the fiscal years 2077/78 to 2081/82.

**Table 18***Contractor All Risk (CAR) Claim Ratio*

<b>Fiscal Year</b>	<b>Average Claim Ratio</b>
2077/78	183.97
2078/79	310.45
2079/80	364.45
2080/81	814.21
2081/82	1705.08

The above table shows that the claim ratio for Contractor All Risk (CAR) hydropower insurance has increased substantially from fiscal year 2077/78 to 2081/82 from 183.97% in 2077/78 to 1,705.08% in 2081/82, indicating that claims exceeded premiums collected under this portfolio. The growth escalated sharply in 2080/81 and 2081/82 possibly due to increased risk exposure and major catastrophic losses. The increasing trend of higher claim ratio suggests potential underpricing of Contractor All Risk (CAR) hydropower insurance policies emphasizing the need to reassess the premiums, underwriting and risk management practices.

### **3.3.10 Claim Ratio of Erection All Risk (EAR) Insurance**

The following table highlights the claim ratio for Erection All Risk (EAR) hydropower insurance across the fiscal years 2077/78 to 2081/82.

**Table 19***Erection All Risk (EAR) Claim Ratio*

<b>Fiscal Year</b>	<b>Average Claim Ratio</b>
2077/78	1422.73
2078/79	81.42
2079/80	64.96
2080/81	71.01
2081/82	41.64

The above table highlights the claim ratio for Erection All Risk (EAR) hydropower insurance over the past five years where trend of significant decline has been observed. The claim ratio was extremely high at 1,422.73% in 2077/78 but it continued to decrease gradually to 41.64% by 2081/82. This trend reflects claim has reduced over years in relative to premium highlighting the importance of better risk management practices, underwriting and premium structures.

### **3.3.11 Claim Ratio of Loss of Profit Insurance**

The following table highlights claim ratio of the Loss of Profit hydropower insurance across the fiscal years 2077/78 to 2081/82.

**Table 20***Loss of Profit Claim Ratio*

<b>Fiscal Year</b>	<b>Average Claim Ratio</b>
2077/78	2,034.15
2078/79	328.20
2079/80	321.79
2080/81	95.31
2081/82	878.50

There seems to be considerable fluctuations in the for Loss of Profit hydropower insurance portfolio where the ratio was extremely high at 2,034.15% in 2077/78, decreased to 328.20% in 2078/79, and became stable at 321.79% in 2079/80 leading to 95.31% in 2080/81 and 878.50% in 2081/82, indicating episodic large losses. This trend suggests the volatility of LOP insurance portfolio where occasional major accidents influence the claim underlining the need for careful risk assessment in this portfolio.

**3.3.12 Claim Ratio of Property Insurance**

The following table highlights the claim ratio for Property Insurance hydropower insurance across the fiscal years 2077/78 to 2081/82.

**Table 21***Property Insurance Claim Ratio*

<b>Fiscal Year</b>	<b>Average Claim Ratio</b>
2077/78	1,341.63
2078/79	712.69
2079/80	1,003.41
2080/81	44.07
2081/82	9,665.54

There seems to be considerable fluctuations in Property Insurance portfolio where the ratio was 1,341.63% in 2077/78, decreased to 712.69% in 2078/79, increased again to 1,003.41% in 2079/80, decreased to 44.07% in 2080/81, and then increased highly to 9,665.54% in 2081/82. This trend indicates that catastrophic losses are significant, spiking the claim ratios highlighting the need to better risk management practices, contingency planning and adequate premium pricing.

**3.3.13 Claim Ratio of Machinery Breakdown Insurance**

The following table highlights the claim ratio of machinery breakdown portfolio across the fiscal years 2077/78 to 2081/82.

**Table 22***Machinery Breakdown Hydropower Insurance Claim Ratio*

<b>Fiscal Year</b>	<b>Average Claim Ratio</b>
2077/78	614.81
2078/79	156.64
2079/80	35.17
2080/81	84.43
2081/82	42.24

The above table presents the claim ratios for Machinery Breakdown Hydropower Insurance where substantial fluctuation over the five years has been observed. The claim ratio was highest in 2077/78 at 614.81%, reflecting high claims relative to premiums collected which may be due to a machinery breakdown related incident. In 2078/79, the average claim ratio decreased sharply to 156.64%, and declined to 35.17% in 2079/80, indicating a period of relatively stable operations. In 2081/82, the average claim ratio again declined to 42.24%, that indicates continued improvement in claim management and mitigation of machinery-related risks. Hence, the portfolio shows trend towards stabilization although it showed some volatility in early years.

**3.3.14 Claim ratio of Machinery Loss of Profit Insurance**

The following table highlights the average claim ratio of Machinery Loss of Profit hydropower insurance across the fiscal years 2077/78 to 2081/82.

**Table 23***Machinery Loss of Profit Claim Ratio*

<b>Fiscal Year</b>	<b>Average Claim Ratio</b>
2077/78	142.70
2078/79	6.97
2079/80	175.12
2080/81	0
2081/82	0.046

The above table represents high variability claim ratios where the claim ratios exceeded 100% in 2077/78 and 20979/80, indicating major machinery loss events that resulted in higher claims than the insured value. However, no claims were recorded in 2080/81, suggesting stable operations without loss events. Low claims in years 2078/79 and 2081/82 further indicate periods of operational stability. The trend of fluctuation in the machinery loss of profit portfolio highlights the importance of adequate insurance planning.

**PART B**

In order to overcome the Data Source Dependence limitation of prior hydro power research, an on-site NIA inspection team was formed who studied hydropower claim files of last 5 years of 8 non-life

insurers, namely IGI Prudential, Neco Insurance, NLG Insurance, Oriental Insurance, Prabhu Insurance, Rastriya Beema Company Limited, Shikhar Insurance and Siddhartha premier Insurance on a sampling basis. Based on the data collected by the team, following key findings are presented whereby the analysis is based on 121 paid claims data.

### 3.4 Sum Insured and Average Project Capacity of Hydropower Insurance

The following table highlights the sum insured and average project capacity hydropower under different portfolios:

**Table 24**

*Sum Insured and Average Project Capacity of Hydropower Insurance*

Portfolios	Average Project Capacity (KW)	Average Sum Insured (Exposure Unit)
CAR	40,312	1,883,539,918
EAR	43,090	1,028,798,022
PLoP	18,158	272,683,644
MB	12,399	317,574,803
MLoP	36,000	543,178,397,025
Property	14,974	1,643,747,792
<b>Grand Total</b>	<b>24,353</b>	<b>5,501,978,586</b>

The above table highlights the average sum insured and average project capacity of different portfolios. The data shows that the large-capacity projects are primarily insured under CAR and EAR policies, having the average capacities of 40,312 kW and 43,090 kW respectively.

Although property Insurance has lower average project capacity (14,974 kW), it carries a high average sum insured, indicating substantial asset values during the operational phase. Similarly, Machinery Loss of Profit (MLoP) portfolio also shows higher exposure per project, highlighting the financial sensitivity of revenue interruptions.

In overall, the figures suggests that hydropower insurance in Nepal is also driven by the stage of project lifecycle and nature of insured risks emphasizing the need of differentiated pricing and underwriting under different portfolios. Overall, the figures demonstrate that hydropower insurance exposure in Nepal is driven not only by installed capacity but also by the stage of the project lifecycle and the nature of insured risks, highlighting the need for differentiated underwriting and pricing across portfolios.

### 3.5 Type of Hydropower Insurance Coverage in Nepal

The following table highlights the coverage type for hydropower insurance in Nepal.

**Table 25**

*Type of Hydropower Insurance Coverage in Nepal*

Coverage Type	Frequency (Top 60%)
All Risk	70%
Fire, Air, Eater, Slide, Light, Explosion, Areal related	9%
Loss Of Profit (LoP)	7%
Act of God (AOG) i.e. Earthquake, Volcanism, Tsunami, Storm, Cyclone, Flood, Inundation, Landslide.	6%
Named Perils	2%

In the above table, the portfolio is highly dominated by “All Risk” policies that accounts for 70 percent of total coverage. This reflects the preference and inclination of insurers and developers towards comprehensive protection against divers’ hydropower risks.

Other peril-based covers i.e. Fire, Eater, Landslide, Air Flood, and Explosion collectively account for smaller share i.e. 9%, while Loss of Profit with 7% share highlights growing awareness of revenue interruption risks. Limited coverage of 6% remains for “Act of God” perils (6%) although Nepal is highly exposed to natural catastrophes, suggesting potential underinsurance in this part specifically, catastrophe-specific risks. Thus, the distribution indicates that all risk policies dominate the hydropower insurance market with scope for more peril based coverage diversification.

### 3.6 Claims Concentration of Hydropower in Nepal

The following table highlights the hydropower claims concentration in Nepal:

**Table 26**

*Hydropower claims concentration in Nepal*

Project Location	Observed Loss Frequency (%)
Sindhupalchowk	18%
Lamjung	12%
Panchthar	9%
Illam	8%
Kaski	8%
Sankhuwasabha	8%
Darchula	5%
Solukhumbu	5%
Myagdi	4%
Rukum	3%
Bhojpur	2%
Makwanpur	2%
Okhaldhunga	2%
Rasuwa	2%
Bagmati	2%
Dolakha	2%
Ramechhap	2%
Taplejung	2%
Bajhang	1%
Doti	1%
Gorkha	1%
Kavre	1%
Marsyangdi	1%

The above table shows the geographic distribution of hydropower insurance claims with concentration in a limited number of districts. The loss of frequency is highest observed in Sindhupalchowk district for 18 percent loss, followed by Lamjung (12 percent) and Panchthar (9 percent). Around 8 percent of total losses, can be observed in Illam, Kaski, and Sankhuwasabha districts reflecting consistent exposure across the hilly regions of Nepal.

The high loss districts are generally located in geologically fragile and monsoon-prone areas, where there is high risk from slope instability, flooding of rivers and terrain difficulty thereby affecting the hydropower sector. High claim concentration in such location suggests that underwriting should be location-based, premium pricing to be differentiated and appropriate risk assessment is required in high hazard zones.

### 3.7 Major Causes of Hydropower Losses in Nepal

The following table highlights the major causes of hydropower losses in Nepal:

**Table 27**

*Major Causes of Hydropower Losses in Nepal*

Major Cause of Hydropower Loss	Frequency (%)
Flood and landslide	77%
Heavy Rainfall	5%
Lightening	3%
Others	15%

The above table highlights that flood and landslide account for 77 percent of total losses thereby dominating the loss profile. This indicates that Nepal is highly exposed to monsoon rainfall, unstable geological conditions and steeper topography.

Heavy rainfall accounts for 5 percent of losses, lightning accounts for 3 percent and 15 percent of losses fall under other causes, which could be operational incidents, mechanical failures, or even localized events. Hence, the dominance of flood- and landslide-related losses highlights the importance of disaster-resilient project design, catastrophe focused insurance arrangements and strong reinsurance support in Nepal's hydropower sector.

### 3.8 Major Reinsurance Structure of Hydropower Insurance

The following table highlights the major reinsurance structure of Hydropower Insurance:

**Table 28**

*Major Reinsurance Structure of Hydropower Insurance*

Reinsurance Structure	Frequency (%)
Treaty and Facultative	62%
Proportional/Treaty	21%
Facultative	16%
Facultative (Treaty and Coinsurance)	2%

The above table shows that most of the hydropower projects have treaty and facultative reinsurance arrangement structure accounting for 62% placements indicating that when hydropower projects exceed treaty capacity, they take up facultative support. Proportional treaty reinsurance alone accounts for 21% of risks, while pure facultative arrangement represents 16%, reflecting the large size and complexity of many projects. Only 2% of cases involve a combination of treaty, facultative, and coinsurance. The table therefore suggests that hydropower projects cannot be covered by only by standard reinsurance treaties alone but they require additional, reinsurance support agreements.

### 3.9 Claim Turnaround Time Analysis (TAT)

#### 3.9.1 Turnaround Time for Contractor All Risk (CAR) Insurance

The following table highlights the Contractor All Risk (CAR) Hydropower Insurance Turnaround Time for Insurers:

**Table 29**

*Contractor All Risk (CAR) Insurance Turnaround Time*

Stage	Mean	Median
Claim Intimation to Surveyor Appointment Time (in days)	22	1
Surveyor Appointment to Report Submission Time (in days)	240	170
Survey Report Submission to Insurer Decision Time (in days)	78	22
Insurer Decision to Payment Made to Insured Time	21	7
Total Turnaround Time (TAT) (in days)	360	298

According to the above table, the surveyor stage (170 days median) accounts for 57% of the total processing time and is the main bottleneck. The CAR portfolio has a 298-day median TAT, indicating considerable operational inefficiencies. The right-skewed distributions with outlier delays necessitating increased IBNR reserves and loss development factors in CAR of hydropower lines of business are indicated by the 62-day difference between the mean (360) and median (298). Improvements in survey scheduling, report finalization, and monitoring might greatly shorten overall claim turnaround times, even though many claims are completed in an acceptable amount of time overall. This is indicated by the variability at the surveyor and reporting stages.

#### 3.9.2 Turnaround Time for Erection All Risk (EAR) Insurance

The following table summarizes the Erection All Risk (EAR) Hydropower Insurance Turnaround Time for Insurers:

**Table 30**

*Erection All Risk (EAR) Insurance Turnaround Time*

Stage	Mean	Median
Claim Intimation to Surveyor Appointment Time (in days)	0	0
Surveyor Appointment to Report Submission Time (in days)	251	263
Survey Report Submission to Insurer Decision Time (in days)	163	111
Insurer Decision to Payment Made to Insured Time	16	6
Total Turnaround Time (TAT) (in days)	431	372

Surveyor delays (263 days median, 71% of overall TAT) continue to be the key bottleneck for EAR portfolio, despite the 372-day median TAT showing a slight improvement over CAR (298 days). Compared to CAR, the mean-median convergence (431 vs. 372 days, 59-day gap) indicates marginally superior process consistency. Nonetheless, there is considerable variation in the effectiveness of insurer decision-making, as evidenced by the 52-day median difference in survey report submission (mean 163 vs median 111). A few complicated or delayed claims greatly raise the average TAT, even when most claims have a very predictable workflow. The higher mean values show outlier cases that call for more careful observation and better process management.

### 3.9.3 Turnaround Time for Property - Loss of Profit (PLoP) Insurance

The following table highlights the Property - Loss of Profit (PLoP) Hydropower Insurance turnaround Time for Insurers:

**Table 31**

*Property - Loss of Profit (PLoP) Insurance Turnaround Time*

Stage	Mean	Median
Claim Intimation to Surveyor Appointment Time (in days)	10	1
Surveyor Appointment to Report Submission Time (in days)	285	264
Survey Report Submission to Insurer Decision Time (in days)	74	39
Insurer Decision to Payment Made to Insured Time	18	13
Total Turnaround Time (TAT) (in days)	388	308

The surveyor stage (264 days median, 86% of total TAT) represents an even larger concentration than CAR/EAR, and the 308-day median TAT for PLoP demonstrates strong performance. Interestingly, the mean-median discrepancy of 80 days (mean 388 vs. median 308) suggests that the average TAT is extended by a few exceptional or difficult claims. Even when the majority of claims are handled in a predictable manner, outlier cases can still have a substantial impact on mean values, highlighting the necessity of close observation, process controls, and reserve considerations.

Overall, the data points to the possibility of significantly reducing total claim turnaround time and enhancing operational reliability for the PLoP hydropower portfolio by maintaining focus on survey scheduling, report submission efficiency, and decision-making consistency.

### 3.9.4 Turnaround Time for Machinery Breakdown (MB) Insurance

The following table highlights the Machinery Breakdown (MB) Hydropower Insurance Turnaround Time for Insurers:

**Table 32**

*Machinery Breakdown (MB) Insurance Turnaround Time*

Stage	Mean	Median
Claim Intimation to Surveyor Appointment Time (in days)	2	2
Surveyor Appointment to Report Submission Time (in days)	286	177
Survey Report Submission to Insurer Decision Time (in days)	21	22
Insurer Decision to Payment Made to Insured Time	14	16
Total Turnaround Time (TAT) (in days)	324	215

According to the above table, the surveyor stage (177 days median, 82% of total TAT) continues to dominate but exhibits better absolute performance, while the 215-day median TAT for MB is the most efficient processing across all hydropower portfolios. With a median of 177 days, or around 82% of the total median TAT, the surveyor stage continues to be the largest contributor. This suggests better scheduling and quicker report preparation when compared to other portfolios.

The existence of a few exceptional claims that considerably increase the average TAT is reflected in the mean-median difference of 109 days (mean 324 vs. median 215). Even though most claims are handled well, these anomalies show that in order to guarantee data quality and spot exceptionally complicated claims, careful monitoring, evaluation, and possible inquiry are necessary.

The Machinery Breakdown portfolio exhibits good operational performance overall, but maintaining and increasing claim turnaround efficiency requires ongoing focus on survey execution and report processing.

### 3.9.5 Turnaround Time for Property Insurance

The following table summarizes the Property Insurance Hydropower Insurance Turnaround Time for Insurers:

**Table 33**

*Property Insurance Turnaround Time*

Stage	Mean	Median
Claim Intimation to Surveyor Appointment Time (in days)	8	0
Surveyor Appointment to Report Submission Time (in days)	251	227
Survey Report Submission to Insurer Decision Time (in days)	64	32
Insurer Decision to Payment Made to Insured Time	15	5
Total Turnaround Time (TAT) (in days)	338	293

The property insurance portfolio's median total turnaround time (TAT) of 293 days shows a reasonable level of efficiency, with many claims being handled in less than a year. With a median duration of 227 days, or around 77% of the total median TAT, the surveyor stage remains the main bottleneck. This demonstrates that the primary factors influencing the total claim settlement time are survey scheduling and report completion. Although some claims encounter longer-than-average delays, the mean-median gap of 45 days (mean 338 vs. median 293) indicates rather consistent processing. The data indicates that outlier cases can greatly affect the average TAT, highlighting the necessity of process monitoring, resource planning, and workflow optimization, even while the majority of claims follow predictable procedures. The property insurance portfolio shows a moderate level of operational efficiency overall, but additional improvements in surveyor coordination and report turnaround might lower overall TAT and increase consistency in claim handling.

### 3.9.6 Turnaround Time for Overall Hydropower Insurance

The following table summarizes the Overall Hydropower Insurance Turnaround Time for Insurers:

**Table 34**

*Overall Hydropower Insurance Turnaround Time*

Stage	Mean	Median
Claim Intimation to Surveyor Appointment Time (in days)	12	1
Surveyor Appointment to Report Submission Time (in days)	253	222
Survey Report Submission to Insurer Decision Time (in days)	73	32
Insurer Decision to Payment Made to Insured Time	17	6
Total Turnaround Time (TAT) (in days)	355	298

The above table indicates that systemic delays in the processing of claims are indicated by the median total turnaround time (TAT) of 298 days for all hydropower insurance. With a median of 222 days,

or over 75% of the entire median TAT, the surveyor stage continues to be the biggest bottleneck. This demonstrates that claim timelines across portfolios are still dominated by survey scheduling and report preparation. With a tiny percentage of claims having prolonged delays, the mean-median gap of 57 days (mean 355 vs. median 298) indicates a modest right-skewness. The surveyor stage exhibits the highest range between mean and median (253 vs. 222 days) among the stages, indicating that the primary cause of overall TAT variability is outlier events in survey execution. Overall, targeted enhancements in surveyor coordination, scheduling, and performance monitoring could significantly shorten the overall claim turnaround time and improve operational consistency throughout the hydropower insurance industry, even though the combined data indicates some efficiency gains when compared to individual portfolio extremes.

### 3.9.7 Cross-Portfolio Findings

The analysis of hydropower insurance portfolios shows that median total turnaround time (TAT) varies according to different portfolio i.e., with Machinery Breakdown (MBI) at 215 days, Property at 293 days, Contractor All Risk (CAR) at 298 days, PL of Property (PLoP) at 308 days, and Erection All Risk (EAR) at 372 days. The technical complexity and difficulty of loss assessment are reflected in this ranking, with EAR requiring specialized knowledge and resulting in lengthier settlement times, whereas portfolios like MBI gain from clearer causality and quicker resolution. With a median of 222 days, or roughly 63% of the entire median TAT of 355 days, the surveyor stage continues to be the primary bottleneck. The 31-day mean-median gap at this point suggests that intermittent high-complexity or high-value claims are the main cause of delays rather than persistent inefficiency, pointing to a possible systemic market vulnerability that might benefit from capacity building, process enhancements, or regulatory attention. When claims are segmented by sum insured, Lower-value claims (less than 30 crore) settle more quickly, with a median TAT of 277 days, but high-value claims (more than 30 crore) have a median TAT of 300 days. This indicates that even for high-value projects, the process is rather efficient, even if larger claims often require more time owing to thorough surveys and loss verification.

Overall, the combination of surveyor concentration risk, portfolio complexity, and high-value claims causes variability in overall turnaround times, even if most claims follow predictable workflows. In the hydropower insurance industry, targeted interventions in surveyor scheduling, reporting effectiveness, and handling complex/high-value claims might significantly lower turnaround times and enhance operational uniformity.

### 3.10 Findings

This section presents the key findings from the study segregated into part A and Part as follows:

#### PART A

#### 1. Market Growth of Hydropower Insurance

- Due to rising investment in hydropower projects, Nepal's hydropower insurance market is expanding gradually.
- The risk profile of the industry is greatly influenced by high-value portfolios like Loss of Profit and Property Insurance
- Risk management is essential since the market is characterized by a combination of exposure to major catastrophic occurrences and normal operational risks.
- The hydropower insurance market in Nepal has expanded, with total premiums rising from NPR 13.04 crore in FY 2077/78 to NPR 63.06 crore in FY 2081/82, and the total sum insured increasing from NPR 14,204 crore to NPR 32,246 crore over the same period.
- The trend towards larger and high value projects is reflected by the number of policies peaking at 142 in FY 2079/80 and slightly declined afterward.

- The number of outstanding claims rose from 57 (NPR 63.31 crore) in FY 2077/78 to 124 (NPR 216.26 crore) in FY 2081/82, indicating probable operational inefficiencies and escalating backlogs.
- The Overall claim settlement ratios of hydropower sector declined from 197.14% in FY 2077/78 to 47.13% in FY 2081/82, indicating that claims paid have not kept up with rising exposures and premiums.

## 2. Market Exposure

- Contractor All Risk (CAR) and Property Insurance are two high-exposure portfolios, with an average of 21 and 27 outstanding claims annually and average values of NPR 30.28 crore (CAR) and NPR 57.61 crore (Property Insurance).
- Growing exposure has been observed in the Loss of Profit (LOP) reflecting 2 claims in FY 2077/78 to 8 in FY 2081/82, with outstanding amounts rising to NPR 49.23 crore.
- High volatility in claims ratio has been reflected where the CAR claim ratio escalated from 183.97% to 1,705.08%, while LOP fluctuated between 95.31% and 2,034.15%, indicating significant operational losses.
- Lower claims have been reported in smaller machinery-related portfolios (Machinery Breakdown and Machinery Loss of Profit) show lower claims but occasional high-value losses, e.g., Machinery Breakdown claim ratio peaked at 614.81% in FY 2077/78.
- Growing hydropower investments and increased insurance penetration are indicated by the rise in both claim frequency and value.
- Reinsurance is essential for handling high-value claims, especially for Property Insurance and LOP, where outstanding ratios increased to 137.80% and 330.49%, respectively, in FY 2081/82.
- Reinsurance recovery delays lead to an increase in outstanding claims, which impacts claim settlement percentages, particularly in portfolios with complex or high-value claims.
- In general, settlement ratios reveal a combination of successful recoveries and backlog accumulation, indicating both the strengths and weaknesses of the current reinsurance arrangements; efficient reinsurance arrangements are essential to avoiding liquidity strain from high-value, infrequent claims.

## 3. Portfolio Specific Performance

- Contractor All Risk (CAR) showed an average of 21 outstanding claims per year (NPR 30.28 crore), with claim ratios rising sharply from 183.97% (FY 2077/78) to 1,705.08% (FY 2081/82), indicating substantial underpricing in comparison to exposures during the construction phase.
- Over the course of the study, Erection All Risk (EAR) showed enhanced settlement efficiency, maintained average outstanding claims at 9 policies yearly, and showed portfolio stability with claim ratios gradually dropping from 1,422.73% to 41.64%.
- Loss of Profit (LOP) showed significant volatility, with claim ratios ranging from 95.31% to 2,034.15%; by FY 2081/82, the average yearly outstanding claims of six policies increased to NPR 49.23 crore, showing exposures to sporadic business interruptions.
- Property insurance showed tremendous volatility, with claim ratios rising to 9,665.54% in FY 2081/82 and an average of 27 outstanding claims per year (NPR 57.61 crore), highlighting the concentration of catastrophic property damage risk.

- Machinery Breakdown & Machinery Loss of Profit showed low claim frequency with infrequent high-severity incidents; peak claim ratios were 175.12% (MLOP) and 614.81% (MB), suggesting intermittent operational disruptions.
- Settlement patterns reveal that routine portfolios (EAR, Machinery Breakdown) obtain faster settlements and lower O/S ratios, while portfolios with fewer but high-value claims (Property, LOP) face delayed processing.

## **PART B**

1. Large Scale hydropower projects are predominantly insured under Contractor All Risk (CAR) and Erection All Risk (EAR) portfolios.
2. Claims volatility is driven more by geographical location and peril concentration than by portfolio size, indicating limited application of risk-based pricing and insufficient differentiation based on hazard exposure.
3. Hydropower insurance claims in Nepal are characterized by systemically long settlement timelines, with an overall median turnaround time of 298 days across all portfolios.
4. Surveyor-related processes constitute the dominant bottleneck, accounting for approximately 62–75 percent of total claims settlement time.
5. Delays at the stage of surveyor appointment, loss assessment, and submission of final survey reports are consistent across insurers and portfolios, indicating a market-wide structural issue rather than isolated operational inefficiencies.
6. Machinery Breakdown claims demonstrate relatively better efficiency, with a median TAT of 215 days, while Erection All Risk and Property Loss of Profit claims exhibit the longest delays, reflecting higher technical complexity and dependence on specialized expertise.
7. Loss experience is heavily skewed toward natural catastrophes, with flood and landslide accounting for approximately three-quarters of total hydropower claims.
8. Claims are geographically concentrated, with a small number of districts contributing a disproportionate share of losses, highlighting weak spatial diversification.

# Conclusion and Recommendations

## 4.1 Conclusion

This study aimed to assess the current state of hydropower insurance in Nepal, focusing on challenges, gaps, and potential improvements in the sector. The analysis of five-year off-site analysis of premiums and claims and a detailed on-site examination of 121 claim files from eight non-life insurers provided several key insights into the performance, risk exposure, and sustainability of hydropower insurance, highlighting both positive trends and areas requiring attention.

The hydropower insurance market in Nepal has grown significantly, with an increasing number of policies issued and premiums collected. This growth reflects the expansion of the hydropower sector and rising recognition of insurance as a critical risk management tool. However, the market has also experienced heightened exposure to complex and high-value risks, particularly in portfolios such as Property Insurance, Contractor All Risk (CAR), and Loss of Profit (LOP). These portfolios have faced substantial claims, leading to volatile claim ratios—ranging from moderate levels in routine operational portfolios like Erection All Risk (EAR) and Machinery Breakdown, to extreme spikes in Property Insurance and CAR—indicating episodic large losses and underpricing in certain cases.

The study also highlighted persistent challenges in claims management. While some insurers have effectively controlled claim ratios and maintained manageable outstanding claims, others have struggled with delayed settlements, high-value claims, and fluctuating settlement patterns. Outstanding claims increased from NPR 63.31 crore in FY 2077/78 to NPR 216.26 crore in FY 2081/82, reflecting a growing backlog and the need for more efficient claims processing. Similarly, the claim settlement ratio declined from 197.14% to 47.13% over the same period, suggesting delays in resolving complex or high-value claims, while reinsurance recoveries fluctuated depending on claim severity.

Despite these challenges, the findings indicate that Nepal's hydropower insurance sector is maturing, with growth potential in asset protection and business interruption coverage. The long-term stability and sustainability of the market will depend on addressing operational inefficiencies, improving risk assessments, strengthening underwriting standards, and developing specialized insurance products tailored to the unique challenges of hydropower projects. Enhanced claims management processes, robust reinsurance arrangements, and better loss data collection will be essential to ensure timely settlements, reduce outstanding claims, and maintain the credibility of the hydropower insurance sector.

## 4.2 Recommendations

Several recommendations are proposed to improve the efficacy, sustainability and efficiency of hydropower insurance in Nepal based on the study's findings. Insurers should prioritize enhanced risk assessment and underwriting practices by incorporating detailed analyses of historical loss data and conducting project-specific evaluations. Advanced modeling techniques and risk-based pricing, tailored to Nepal's unique geographical, environmental, and operational risks, will improve premium adequacy and better align coverage with actual exposures. Claims management and settlement efficiency must also be improved by streamlining processes, adopting digital platforms, standard digital claims tracking system, and maintaining clear communication with stakeholders, particularly for high-value and complex claims such as Contractor All Risk (CAR), Loss of Profit, and Property Insurance, which often experience delays and high outstanding ratios.

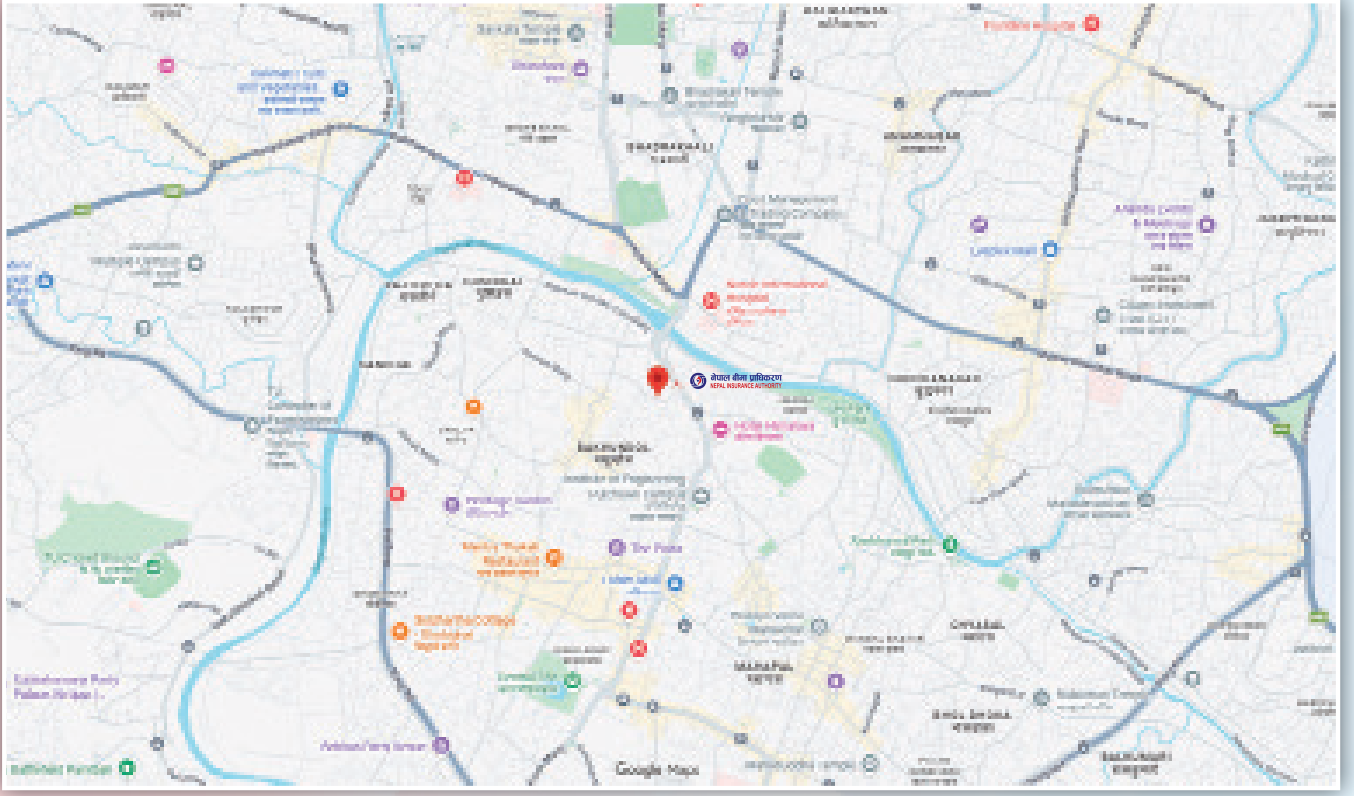
Strengthening reinsurance and risk-sharing mechanisms is another priority, with insurers encouraged to expand collaboration with international reinsurance companies while building local reinsurance capacity. Such arrangements will help manage large claims, mitigate financial stress, and enhance overall stability. The development of specialized insurance products addressing the distinct risks

of hydropower projects—including machinery breakdown, business interruption, climate-related events, earthquakes, and glacial lake outburst floods (GLOFs)—will provide more comprehensive protection and better meet sector needs. On the regulatory front, the Nepal Insurance Authority and government should enforce higher capital reserve requirements, establish standardized policy frameworks, and monitor claims settlement timelines to harmonize industry practices and ensure financial solvency. Similarly, it can set benchmarks for claim settlement timelines specifically considering the nature of hydropower projects, establish accreditation and minimum competency standards for hydropower surveyors, Promote differentiated pricing based on loss location and claims performance and enhance supervisory review of reinsurance structures for large hydropower risks.

Capacity building is also essential, with insurers investing in training for underwriting, claims handling, and reinsurance coordination, focusing on sector-specific risks and modern risk management technologies. Additionally, the creation of a centralized hydropower insurance database will improve risk assessment, forecasting, and loss prediction, benefiting insurers, regulators, and stakeholders alike. Finally, engaging hydropower developers through awareness programs on risk mitigation, timely reporting, and adequate coverage will reduce claim frequency and severity. The hydropower insurance sector in Nepal faces significant operational and structural challenges, particularly in claims management. Addressing surveyor capacity constraints, improving data governance, and aligning practices with international benchmarks are critical for ensuring the long-term sustainability of hydropower insurance. By implementing these measures, the hydropower insurance sector in Nepal can enhance risk management, reduce financial volatility, improve claim settlement efficiency, and support the continued growth and sustainability of the country's hydropower industry.

## References

- Bhattarai, S., & Joshi, M. (2020). *Natural disaster risks and hydropower development in Nepal*. *Journal of Environmental Science*, 15(3), 45-60.
- Nepal Insurance Authority. (2023). *Annual report 2022/23*. Kathmandu: Nepal Insurance.
- Khadka, R. (2022). Challenges and opportunities in hydropower insurance: A case study of Nepal. *Nepal Journal of Risk Management*, 5(1), 20-35.
- Nepal Electricity Authority. (2022). *Annual report 2021/22*. Kathmandu: Nepal Electricity Authority.
- Nepal Hydropower Association. (2021). *Hydropower sector report*. Kathmandu: NHA.
- Sharma, P., & Thapa, S. (2023). Insurance challenges in Nepal's hydropower sector. *Journal of Nepalese Insurance Studies*, 8(2), 110-125.
- Shrestha, B. (2019). Renewable energy development in Nepal: A focus on hydropower. *Energy Policy Review*, 12(4), 112-130.



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