At the Heart of Risk: The Evolving Role of Actuaries from Natural Catastrophes to Neural Networks

24 March 2026

Reliance and limitations

AASL Actuarial Association of Sri Lanka   CONVENTION ASIA

PRESENTER(S) PROFILE

Presenters

Shashini Abeygunawardena

Chair | Climate Risk & Sustainability Subcommittee | AASL

Founder & Principal Consultant | Starboard Global Partners

Over the past decade, as an actuarial consultant, Shash has worked with financial institutions across the Asia Pacific, helping them navigate uncertainty, manage risk, and solve strategic and regulatory challenges. In addition, she has supported entities in assessing their climate resilience, developing strategies to address climate-related risks and opportunities, as well as implementing and communicating high-impact initiatives. Shash is also a sustainability advocate who actively contributes to capacity-building initiatives in the climate risk & sustainability space, through her volunteer work with various actuarial associations. In 2025, she founded Starboard Global Partners to help people and businesses understand and manage climate-related risks and opportunities - charting their course to climate resilience.

Presenters

Kasun Amarasuriya

Vice President | AASL

Senior Manager| Actuarial Services | EY

Kasun is a seasoned actuarial professional with nearly a decade of experience in the life insurance industry across Sri Lanka, Australia and New Zealand. As a Senior Manager at EY, he leads complex engagements spanning modelling, valuation, experience investigations, and Appointed Actuary support. His expertise includes embedded value reporting, mergers & acquisitions, and IFRS 17 implementation. Kasun is a Fellow of the Institute of Actuaries of Australia and a Chartered Accountant, known for his ability to translate technical insights into strategic outcomes for senior stakeholders.

Presenters

Theodore John Kotelawala

Manager| Pricing | Union Assurance PLC

Theodore has experience across life insurance, equity research and transaction advisory with nearly a decade of experience across the financial services industry. In addition to his work in Pricing and IFRS17 implementation, Theodore works on a number of projects related to Data Science and AI, including the development of a GPT specific for actuarial use. He represents the AASL on the International Actuarial Association's AI Task Force and supports several initiatives of the SOA, including AI research. He also works as a Visiting Academic in the area of Macroeconomic Policy.

AASL Actuarial Association of Sri Lanka   CONVENTION ASIA

Presenters

Roshane Samarasekera

Senior Actuary | Accident Compensation Corporation (ACC) New Zealand

Roshane grew up in Sri Lanka and now works as a Senior Actuary in ACC New Zealand's Actuarial Monitoring & Insights team. The team produces the annual financial condition report, monitors claim performance and the impact this has on the Outstanding Claims Liability, reviews injury prevention programme performance and collaborates across the organisation on rehabilitation initiatives. Prior to joining ACC Roshane has worked in consulting and insurance supervision in New Zealand and the UK. Roshane is a Fellow of the New Zealand Society of Actuaries and the Institute and Faculty of Actuaries, UK.

Agenda

Topic
Localising Global Best Practices: Building Back with Resilience
Actuaries in the Age of AI: Evolving Roles, New Risks, and Responsible Innovation

At the Heart of Risk: The Evolving Role of Actuaries from Natural Catastrophes to Neural Networks

Localising Global Best Practices: Building Back with Resilience

Insurance as a lifeline – staying above flood waters

Copernicus Sentinel data (2025), processed by ESA

AFP

- The devastating impact of Ditwah is the worst in living memory.
- More than 2.2 million people were impacted by the floods caused by the cyclone.

What made Ditwah different

- Typically, damage from cyclones are primarily caused by significant wind. However, Ditwah was relatively weak (wind gusts of up to 75 km/h compared to 220 km/h experienced in prior periods).
- Most of Ditwah's damage was caused by the sheer amount of rainfall within a short period of time made this different.
- Nearly 10% of the annual rainfall falling within a 24-hour period.
- All 25 districts of the country were impacted.
- The location where Ditwah formed is also unsual, forming at 5 degrees above the equator and intensifying over the island.
- Similarly, Cyclone Senvar (Indonesia) and Cyclone Koto (Philippines) formed at unusually low latitudes.
- This may be symptomatic of the fact that ocean temperatures are warming leading to increased atmospheric moisture and in some cases supporting intense rainfall even from comparatively modest wind storms.
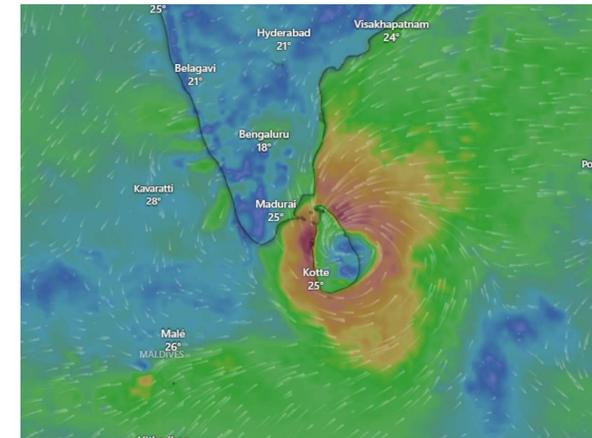
Cyclone Ditwah Live Tracker Map - lokamattimes

An Actuarial Lens

- Devastation caused by the cyclone.
  - 640 lives lost
  - Total physical damage about USD 4.1b about 4% of GDP.

Cyclone Ditwah - estimated physical damage

Physical damage from Cyclone Ditwah (USD)
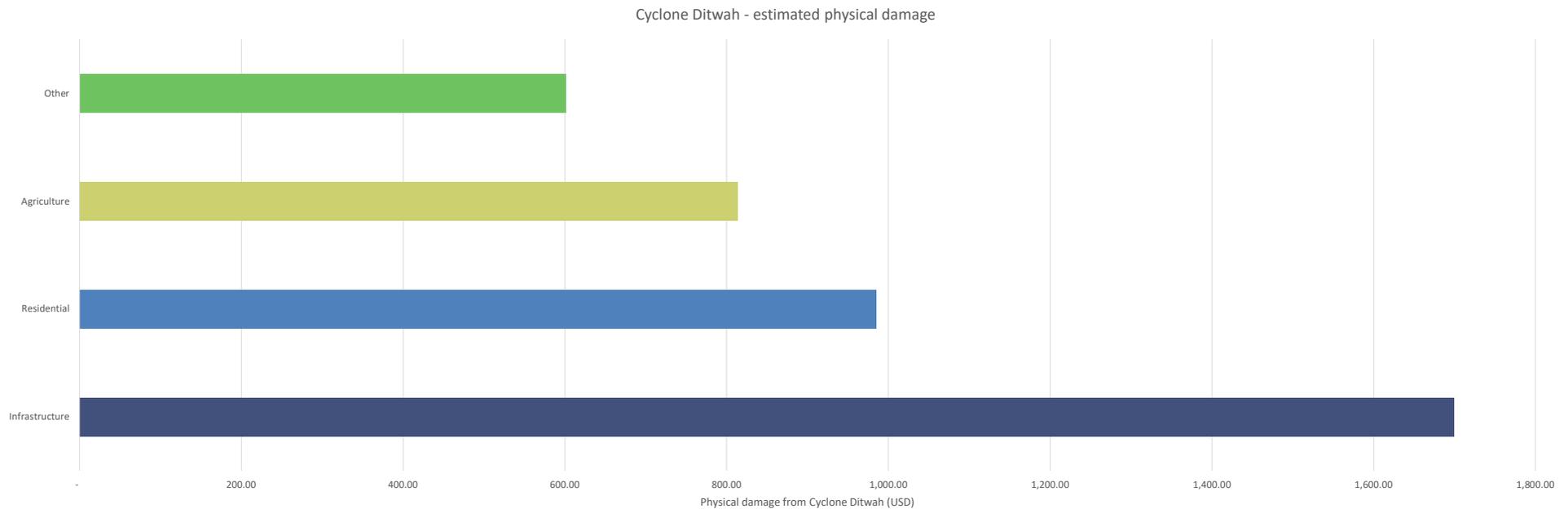
An Actuarial Lens

- Devastation caused by the cyclone – insurer's point of view
  - No notable increase in death/disability claims.
  - Approximately USD 190m worth of insured losses claimed.

Insured vs uninsured

■ Insured losses   ■ Uninsured losses
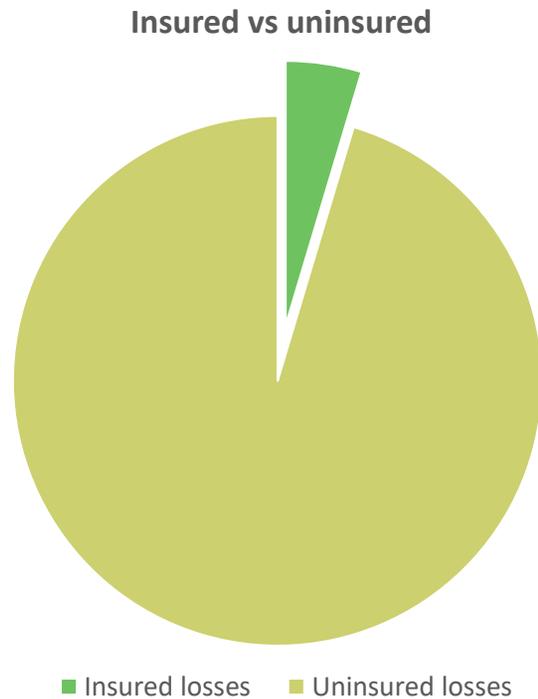
Mind the gap

Demand Side Barriers

▸Cultural barriers
▸Trust
▸Awareness
▸Affordability

Market and Policy Barriers

▸Product gaps
▸Low penetration
▸Lack of incentives
▸Distribution friction

What are insurers & actuaries around the world doing about it?

Using insurance for disaster risk management

- Derisk climate mitigation & adaptation through insurance innovation

- Design parametric insurance for disaster relief

Leveraging expertise to build a climate resilient future

- Perform climate risk assessments & scenario analyses

- Advocate for building back better

AASL Actuarial Association of Sri Lanka

CONVENTION ASIA

Derisk climate mitigation & adaptation

Zurich and Aon to support net-zero transition through new clean hydrogen insurance facility

"

Insurance is a key enabler to facilitate the net-zero transition, providing protection as well as risk expertise. Clean hydrogen has immense potential as an eco-friendly alternative to fossil fuels and we strongly believe it can play a critical role in the energy transition. We are proud to bring this ground-breaking initiative to the market together with Aon.

Sierra Signorelli, CEO Commercial Insurance at Zurich

The Africa Climate Risk Insurance Framework for Adaptation's areas of intervention

ACRIFA will accelerate adaptation across the agri-food system by:

Supporting the African network of primary insurers: Leverage the extensive network of primary insurers to efficiently deliver innovative, targeted insurance solutions for African agri-food systems

Addressing acquisition and diversification: Tackle the high cost of client acquisition through aggregation to achieve scale and broaden the geographical diversification of risks that currently deter investment in the climate-sensitive agri-food sector
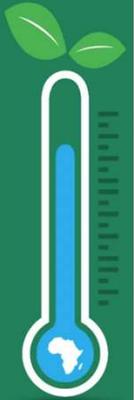
Designing and expanding insurance solutions: Developing and scaling innovative insurance products covering risks like droughts, floods, pests credit, price fluctuations and transition challenges

Enabling environment and capacity building: Invest in data, digital frameworks and skills development and support initiatives establishing a conducive policy and regulatory landscape

Channeling climate finance: ACRIFA will direct climate finance toward initiatives and programs that harness insurance products to de-risk finance, accelerate climate adaptation and advance net-zero goals within the agri-food system

Design parametric insurance for disaster relief

South Africa: Lack of rainfall parametric cover for hydropower production

Peril/s	Lack of Rainfall
Geography/Region	Southern Africa
Years	2025 – 2027 within a Long-Term Agreement (LTA)
Exposure covered	Revenue loss & extra surcharge due to power purchasing
Trigger type/s	Pure parametric: cumulative rainfall index
Trigger mechanism/s	Gridded cumulative rainfall dataset integrating satellite measurements and observations from weather stations
Key information	Lack of rainfall targeting high frequency losses, impacting the balance sheet (goal: return period of 1-in-5 years). Linear payout structure (with agreed strike and exit)
Annual Limit	USD$ 70 million
Issuer	
Cedant	
Parties Involved	Local broker, utility company, local insurer, Descartes Underwriting for Pricing and Data Analysis, (re)insurance panel of MGA, weather data provider, weather data certification agent

Source: IDF Survey of Parametric Risk Transfer Solutions [2025]

AXA Launches Pioneering Heatwave Parametric Insurance

To safeguard outdoor practitioners amid escalating climate risks in the summer in Hong Kong

AXA Hong Kong and Macau ("AXA") is committed to being a driving force against climate change, and leveraging its expertise in climate risk assessment to support businesses in addressing related risks and building a sustainable future. Today, we are pleased to announce the launch of the market-first "**Heatwave Parametric Insurance**", an offering that aims to provide enhanced protection for outdoor practitioners that work outdoor in the summer.

Climatological data over the past three decades paints a discernible picture – the annual mean temperature in Hong Kong has exhibited a statistical increase of 0.30°C per decade from 1994 to 2023 [1]. This alarming and persistent significant rise poses heightened risks for certain occupations, such as construction workers, property management staff, as well as practitioners in the public utility and transportation sectors, who are routinely exposed to outdoor conditions during extreme heat events. Recognising this pressing need, AXA took the lead to introduce the "**Heatwave Parametric Insurance**", providing flexible and convenient benefits for heat stress prevention and protecting affected practitioners.

Source: AXA press release

Perform climate risk assessments & scenario analyses
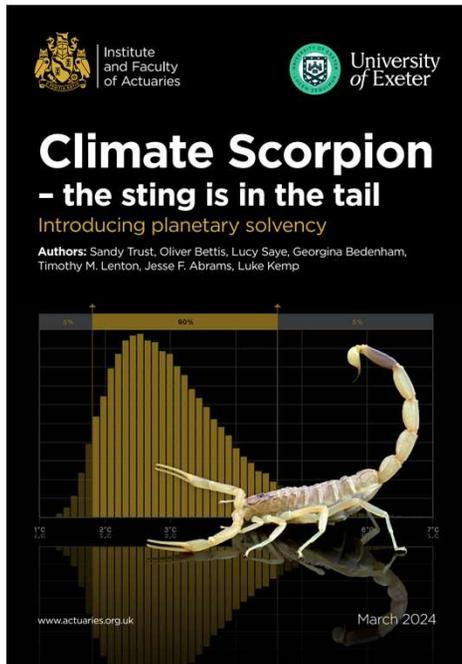
Source: Climate Scorpion – the sting is in the tail [March 2024] | Parasol Lost: Recovery plan needed [January 2026] | IFoA & University of Exeter

Source: A practical guide to scenario analysis for public sector [August 2025] | Government Actuary's Department UK

Advocate for building back better
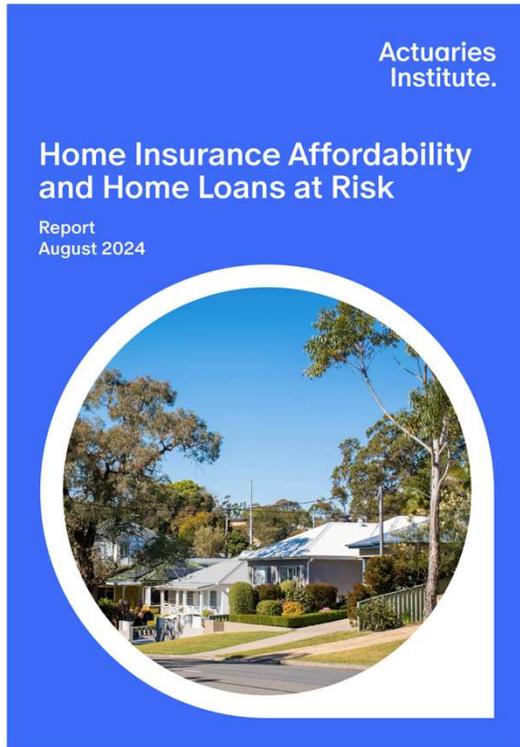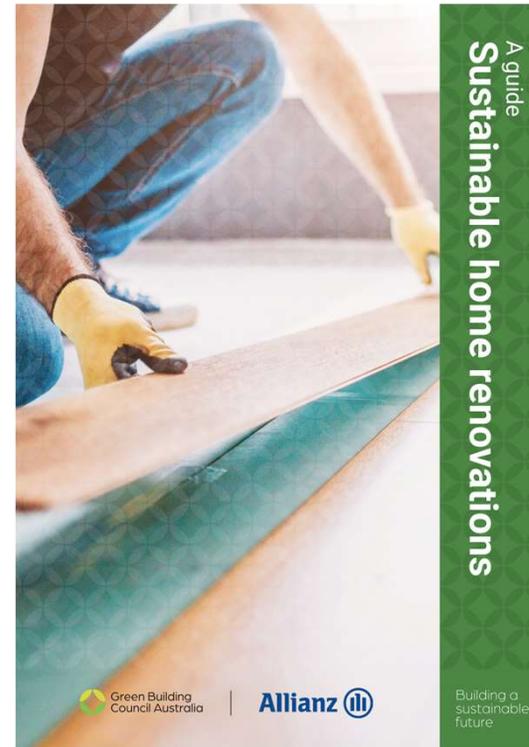
Disaster Risk Finance forms one part of a comprehensive approach to disaster risk management

Pillar 1: Risk Identification

Pillar 2: Risk Reduction

Pillar 3: Preparedness

Pillar 4: Financial Protection

Pillar 5: Resilient Recovery

IAA SL Actuarial Association of Sri Lanka

CONVENTION ASIA

There are four core principles to Disaster Risk Finance

Timeliness of funding

Disaster risk layering

Disbursement of funds

Data and analytics

Source: Global Facility for Disaster Reduction and Recovery

AASL Actuarial Association of Sri Lanka

CONVENTION ASIA

Disaster Risk Finance works best when set up in layers

Hazard type	Disaster risk	Instruments to manage risk	
Low frequency /High severity	**High risk layer** (e.g. major tropical cyclone or earthquake)	**Market-based Instruments**	Transfer risk
	Medium risk layer (e.g. national floods, minor earthquake)	**Contingent Financing**	Retain risk
High frequency /Low severity	**Low risk layer** (e.g. local floods and landslides)	**Budgetary Instruments**	

Uncertain International Assistance

Source: Global Facility for Disaster Reduction and Recovery

AA SL Actuarial Association of Sri Lanka

CONVENTION ASIA

Governments seek protection for four main groups

National and local governments

Homeowners and small and medium-sized enterprises (SMEs)

Farmers and agriculture

Poorest members of society

IAASL Actuarial Association of Sri Lanka

CONVENTION ASIA

Homeowners and SMEs incurred heavy losses during Ditwah

Reuters
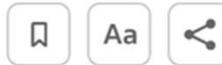
Sri Lanka cyclone survivors afraid to go home, stuck in relief centres

By Uditha Jayasinghe

December 5, 2025 11:05 PM GMT+13 · Updated December 5, 2025

the SUNDAY TIMES

Sunday, December 21, 2025

Cyclone Ditwah exposes deep issues in Sri Lanka's MSME sector

By Bandula Sirimanna

View(s): 411

DW IN FOCUS Iran war German politics Ukraine

CATASTROPHE | SRI LANKA

Sri Lanka: Cyclone Ditwah kills over 600

Rana Taha with AFP, dpa, Reuters
12/05/2025

The cyclone caused landslides and floods that have killed hundreds of people, with hundreds more still missing. Sri Lanka is trying to secure IMF assistance to deal with the aftermath of the disaster.

Daily FT Be Empowered

Sri Lanka's SMEs need more than relief: They need reform, protection

Monday, 16 February 2026 02:03   💬 -   ⏲ - 192

Source:
Sri Lanka cyclone survivors afraid to go home, stuck in relief centres | Reuters
Sri Lanka: Cyclone Ditwah kills over 600
Cyclone Ditwah exposes deep issues in Sri Lanka's MSME sector | Print Edition – The Sunday Times, Sri Lanka
Sri Lanka's SMEs need more than relief: They need reform, protection | Daily FT

AASL Actuarial Association of Sri Lanka

CONVENTION ASIA

Increasing insurance penetration is one way to increase financial protection

Private sector

Property insurance

Accidental death insurance

Business interruption

Public sector

Government budget management
(e.g. parametric insurance, catastrophe bonds)

But there are some challenges to overcome when developing products
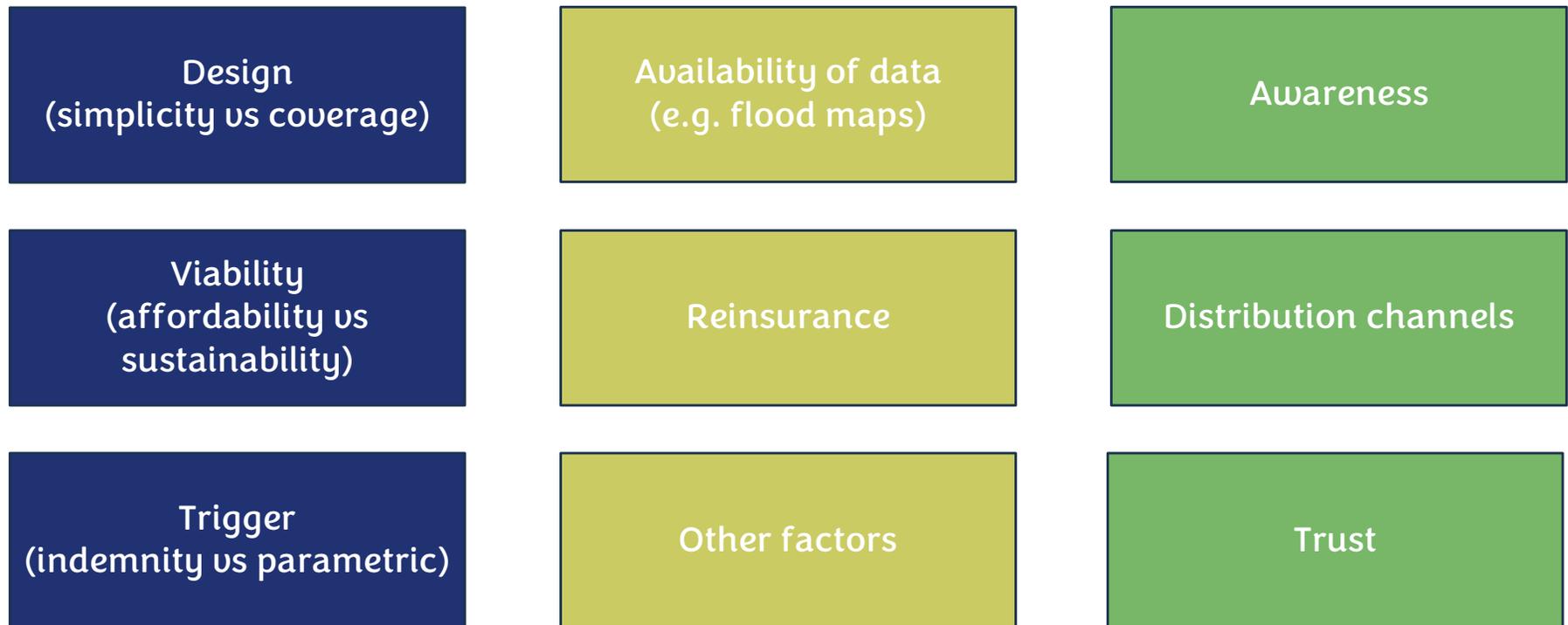
Design (simplicity vs coverage)	Availability of data (e.g. flood maps)	Awareness
Viability (affordability vs sustainability)	Reinsurance	Distribution channels
Trigger (indemnity vs parametric)	Other factors	Trust

At the Heart of Risk: The Evolving Role of Actuaries from Natural Catastrophes to Neural Networks

Actuaries in the Age of AI: Evolving Roles, New Risks, and Responsible
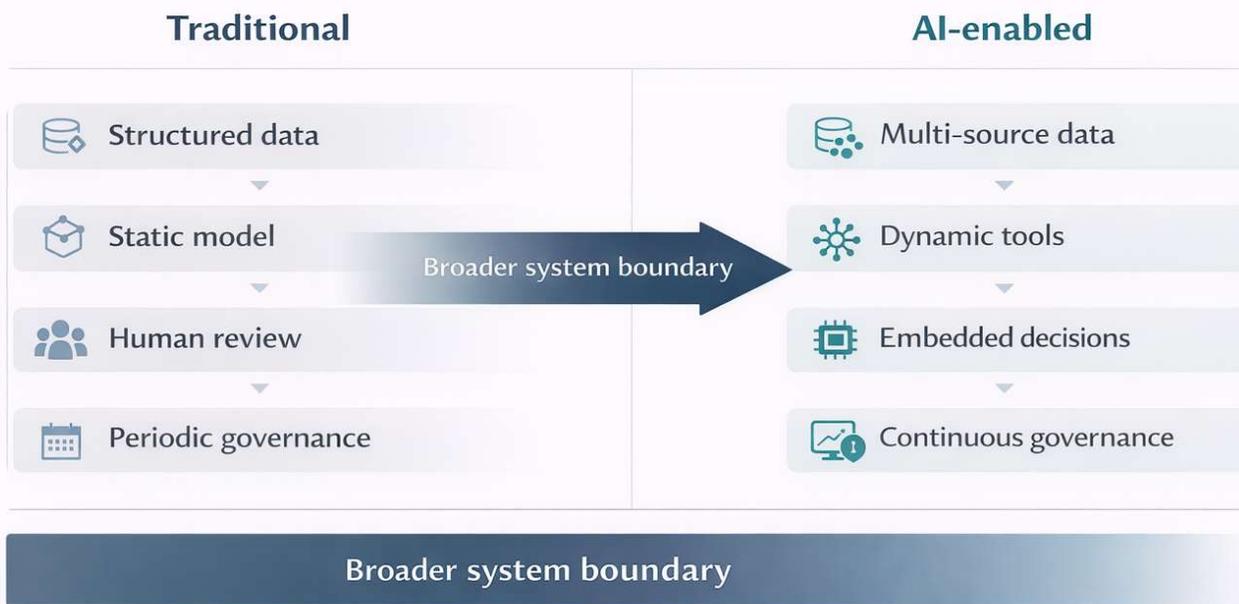Innovation

Why this matters now

- AI is moving into core insurance processes

- GenAI is changing how technical work is done

- Speed and scale are increasing

- Increasing risk and regulatory scrutiny

Value created	Risk introduced
✔ Speed	⚠ Bias
✔ Scale	⚠ Opacity
✔ Better prediction	⚠ Privacy
✔ Automation	⚠ Drift

AI increases both capability and exposure.

What AI changes

- More data, in particular unstructured data

- Faster, more frequent decisions

- Less visible boundaries between model and processes

- Greater need for ongoing monitoring

- Shift from model building to governing decision systems

Where AI shows up in insurance

- **Product Development** – Customer segmentation

- **Pricing and underwriting** – Risk scoring, underwriting assistance

- **Claims and fraud** – Automated information extraction and flagging

- **Customer operations** – Information retrieval

- **Finance and risk** – Anomaly detection in portfolio experience

Why actuaries matter here

- Strong grounding in risk and uncertainty

- Focus on financial materiality

- Experience with model limitations

- Professional and ethical accountability

- Ability to translate technical results into decisions

Quantitative discipline · Risk judgment · Professional · Accountability · Actuarial value in AI governance
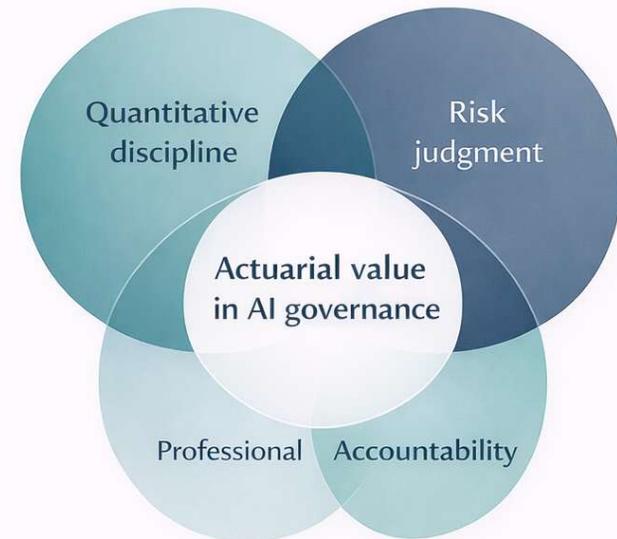
AI needs more than technical skill. It needs disciplined judgment.

Evolving actuarial roles

- From model builder to model steward

- From periodic review to continuous monitoring

- From technical specialist to cross-functional risk partner

- From model focus to decision-system oversight

- From analysis delivery to governance and accountability

New AI risks

- Bias and unfair discrimination

- Weak explainability

- Drift and instability

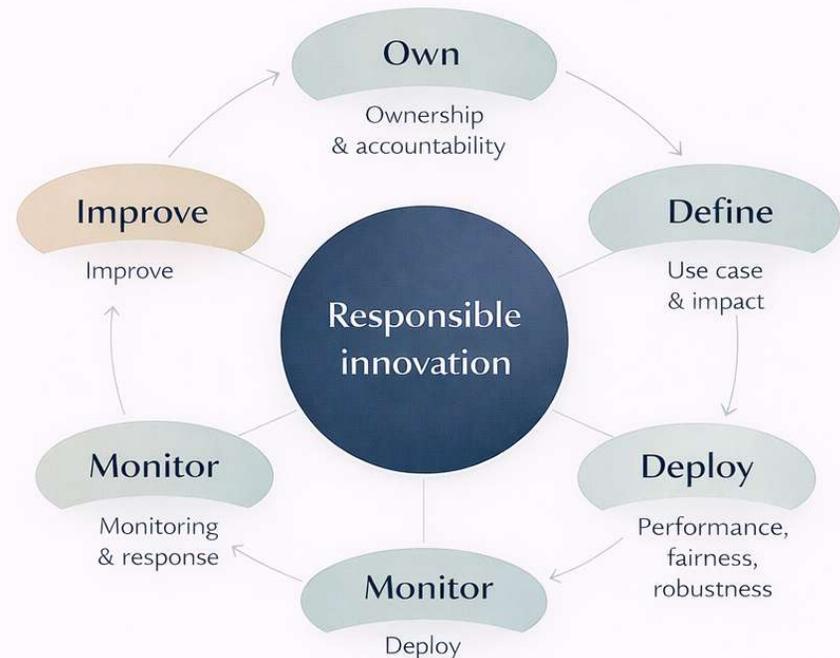- Privacy and confidentiality

- Security and misuse
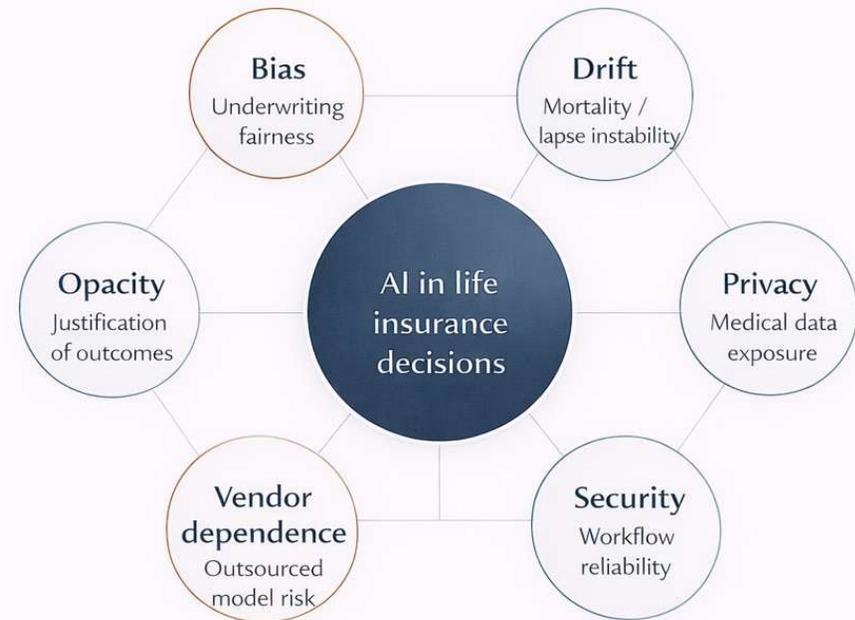
Once AI affects life insurance decisions, its risks become actuarial and governance risks.

Direction of regulation

- Accountability

- Documentation

- Testing

- Monitoring

- Human oversight

Responsible innovation

- Clear ownership

- Defined use cases and UAT

- Data governance

- Human oversight

- Monitoring and escalation

- Ability to explain decisions

Controls actuaries need to insist on

Before deployment	During deployment	After deployment
• Intended use defined • Assumptions challenged • Features tested for proxy risk	• Decisions remain reviewable • Changes are controlled • Logging & documentation	• Experience is monitored • Drift is detected early • Models are revalidated when needed

- Clear business purpose

- Data and feature review

- Independent validation

- Monitoring and thresholds

- Human override and escalation

- Audit trail and version control

AASL Actuarial Association of Sri Lanka

CONVENTION ASIA
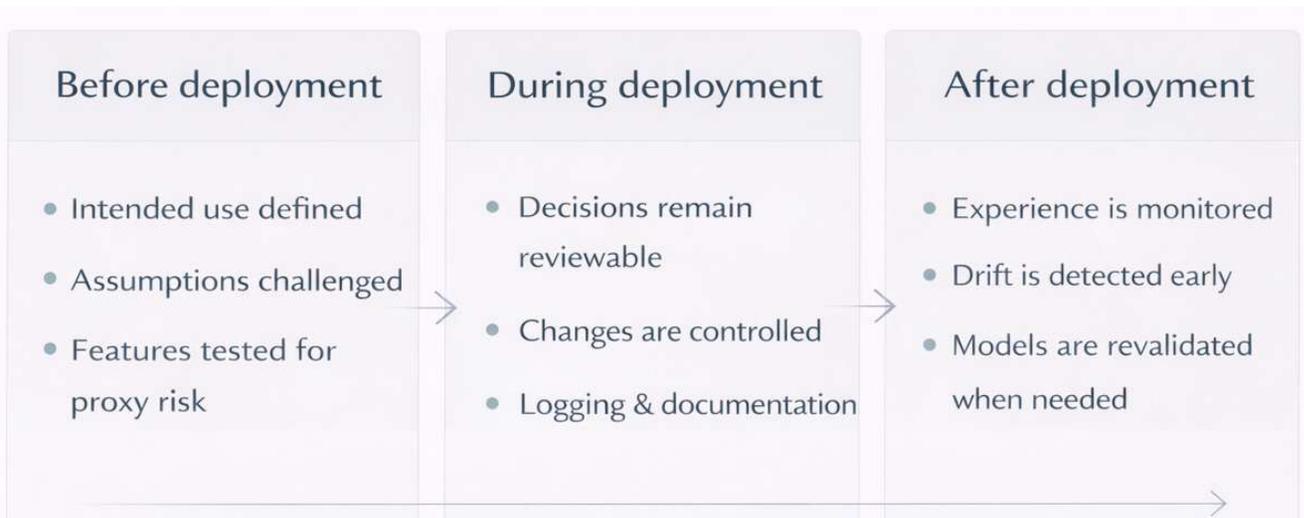
GenAI: Value and danger

- Faster drafting, coding, and summarizing

- Useful as a productivity tool

- However can leak data and mislead

Skills actuaries need

- Data literacy

- AI and ML basics

- Model risk management

- Fairness and governance awareness

- Data translation and communication

What companies (and actuaries) should do next

• AI use cases

• Risk classification of use cases

• Minimum governance standards

• Define standards around GenAI use

• Build monitoring and escalation

THANK YOU!