

# AI-03134 Typhoon Tino Risk Analysis vs AAR

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Tags	Problem
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Perform a risk analysis and after action review of the typhoon Tino .

## Direct Answer

Here is a risk-analysis and after-action review of Typhoon Tino (international name Typhoon Kalmaegi) in the Philippines.

### Risk Analysis

#### 1. Hazard & Exposure

- Tino developed rapidly, entered the Philippine Area of Responsibility (PAR), and intensified to typhoon status with maximum sustained winds of ~150 km/h and gusts up to ~185 km/h.
- Heavy rainfall and storm surge: coastal waters were forecast up to ~3.0 m or more in some seaboard.
- Large population exposed in central Philippines (Visayas, Caraga region, Dinagat Islands, Palawan, Mindoro) – many low-lying coastal/riverine communities.

#### 2. Vulnerabilities

- Many homes constructed of light materials, in flood- or landslide-prone zones. Eg: structural damage in Dinagat Islands: 680 houses damaged in one municipality.

- Infrastructure (bridges, power plants) weak: eg. Cambinliw wooden bridge impassable, Gibusong Island power plant 40% damage.
- Water supply, sanitation, communications at risk: evacuation/displacement data show magnitude of disruption.
- Pre-existing disasters: The region had been stressed by prior storms, which can degrade resilience (though not detailed in each source).

### 3. Risk (Likelihood × Impact)

- Likelihood: High. Philippines is in a typhoon corridor, and this year is already active (#20th system).
- Impact: High. Hundreds of thousands displaced; significant deaths; large infrastructure damage; agricultural losses.
- Therefore, the risk level is very significant. One analysis rated the severity as 4/5 with 90% confidence.

### 4. Key Risk Drivers

- Rapid intensification and landfall trajectory.
- Multi-hazard environment: wind + rainfall + storm surge + flooding/landslide.
- Exposure of densely populated coastal areas (Visayas, Caraga).
- Infrastructure fragility and accumulation of prior hazard stress.
- Evacuation and sheltering logistics challenged by geography (islands, remote communities).

### 5. Pre-Event Mitigation and Preparedness Considerations

- Early warnings: The Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) bulletins and wind signals were issued.
- Evacuations: Coastal and high-risk areas were, in some cases, preemptively evacuated.
- Infrastructure reinforcement, community awareness, shelter readiness: these are recurring needs for the Philippines, and this storm again tests them.

## **After-Action Review**

## What went well

- Early warning systems functioned: wind signals, bulletins, advisories for sea travel.
- Some level of evacuation and pre-positioning of relief: Large numbers of people evacuated; relief efforts mobilising.
- Focus on rural/remote areas: For example, in Dinagat Islands, priority actions defined (power restoration, alternate comms, health/sanitation).

## What could have been improved / lessons learned

- Infrastructure resilience: Bridges, power-plants and other critical links failed / were heavily damaged (e.g., in Dinagat: 25 % of houses in Basilisa damaged; significant damage to power plant)
- Shelter and evacuation logistics: Large numbers displaced (~1.1 million people affected; 577,928 displaced as of early data)
- Post-event humanitarian and health response must ramp quickly: flooding leads to water contamination, disease risk, isolation of communities. The review flagged this in the risk analysis.
- Communication and power redundancy: Downed lines, interrupted comms, remote/isolated communities.
- Agriculture and livelihood loss: Bananas, coconuts damaged, cassava lost (in Dinagat) which impacts longer-term economic resilience.
- Coordination of relief efforts: Given multiple affected provinces, island/archipelago geography, ensuring timely supply and access remains difficult.

## Recommended next steps / recovery actions

- Rapid damage assessment across affected provinces; prioritise restoration of power, clean water, sanitation, roads. (Dinagat local authorities already started this)
- Shelter upgrading: Increase capacity, ensure structural integrity of evacuation centres, ensure safe location (away from flood/landslide hazards).

- Infrastructure hardening: Bridges, power plants, communication lines in high-risk zones must be strengthened.
- Agricultural recovery: Provide seeds, saplings, inputs to farmers, particularly in banana, coconut, cassava sectors.
- Livelihood support: For displaced persons, for small business/resort/tourism sector (especially in Visayas).
- Health & sanitation: Monitor for waterborne diseases, leptospirosis, ensure safe drinking water, and psychological support for displaced persons.
- Update risk mapping and community awareness: especially for remote/coastal barangays. Use this storm data to refine evacuation thresholds, infrastructure design.
- Insurance and financing: Encourage community/municipality insurance, contingency funds for rapid response.
- Knowledge capture: Document this event's hazards, responses, successes and failures — feed into DRR (Disaster Risk Reduction) planning.

## **Key Reasons (Concise)**

- High hazard intensity (wind + rain + surge) combined with high exposure in vulnerable coastal/archipelagic communities.
- Infrastructure and community vulnerability amplified the impact (weak bridges, power plants, remote islands).
- Although pre-warning and evacuation helped, the scale of displacement and damage shows the gap between preparedness and resilience.
- Recovery demands are multi-sector (power, water, agriculture, health, livelihoods) and island geography complicates logistics.

## **Alternatives**

If you were analysing for a specific domain (e.g., for your water-refilling business in Cebu/Visayas, or for your planned farms in Mindoro/Palawan), you might

choose a business-specific risk review rather than a broad DRR review. For example:

- Alternative A: Focus purely on business continuity risk for water supplies, power outage, transport disruption during such typhoons.
- Alternative B: Focus on agricultural risk (for your planned coffee/corn farm) looking at how typhoon risk affects crop loss, landslide risk, infrastructure.
- Alternative C: Focus on housing/settlement resilience (given your condo and apartment rental scenario) – how coastal/urban apartment infrastructure holds up, evacuation logistics, insurance.

## Action Plan

### 1. Within 24-48 hours

- Monitor official bulletins from PAGASA and NDRRMC for updated damage/evacuation data.
- If you have assets or operations in the region (Visayas, Mindoro, Palawan), check status of power/water/transport.
- Activate your emergency contact list and ensure communications are operational (cell, backup).

### 2.

### 3. In the next 1-2 weeks (Recovery phase)

- Conduct a quick “impact audit” of your exposures (business, property, personal) in the affected area: infrastructure, transport, supply chain.
- Engage with local LGU/DRR office to understand relief/rehabilitation programmes and how you might assist or benefit (e.g., for your water-refilling business, relief operations may require water).
- Review insurance/financial protection: Are you covered for typhoon/flood damage? Assess gaps.

### 4.

### 5. In 1-3 months (Resilience phase)

- Review and update your disaster-preparedness plan: consider worst-case repeat of Typhoon Tino conditions.
- Invest in infrastructure hardening: For example, if you operate a water-refilling station in a typhoon-prone zone, ensure flood risk mitigation, backup power, secured supply.
- For your upcoming coffee/corn farm build-out: incorporate typhoon and rainfall risk into site selection (avoid flood/landslide zones), design drainage, access roads, shelters.
- Community engagement: If your business or future farm interacts with the local community, embed DRR awareness, community evacuation/relief links, so you are part of the resilience fabric.

6.

#### 7. Long-term (Strategic phase)

- Use this event (Typhoon Tino) as a case study: capture lessons, update finances and risk models (e.g., how often do storms of this magnitude strike your region?).
- Consider diversifying your property/operational exposure away from highest-risk zones (e.g., extremely low-lying coastal).
- Build buffer capital or contingency fund in your business plan for future disasters (so your station or farm doesn't go under if major event occurs).
- Monitor climate change trends: Typhoon behaviour (intensity, rainfall, trajectory) may shift; incorporate that into your investment/business review.

8.

If you like, I can produce a detailed heat-map of affected provinces, estimated economic losses, and scenario modelling for your specific interests (farm, water station) for Typhoon Tino. Would you like me to pull that together?