

# 國立臺北大學自然資源與環境管理研究所

## 110 學年度第二學期『環境災害與風險管理』

課程講義 (05)：生活防災與氣候變遷調適

Disaster Prevention in Life and Adaptation to Climate Change

### ● INTRODUCTION (DISASTER PREVENTION AND PROTECTION)

#### □ 災害防救法 (089.07.19 => 108.05.22 )

⇒ 災害：指下列災難所造成之禍害 (106.11.22)：

- (一)風災、水災、震災 (含土壤液化)、旱災、寒害、土石流災害、火山災害等天然災害。
- (二)火災、爆炸、公用氣體與油料管線、輸電線路災害、礦災、空難、海難、陸上交通事故、森林火災、毒性化學物質災害、生物病原災害、動植物疫災、輻射災害、工業管線災害、懸浮微粒物質災害等災害。

⇒ 災害防救法第 47-1 條 => 司法院-常見問答-失蹤多久時間才能向法院聲請死亡宣告?

(099.01.27) 人民因災害而失蹤時，檢察機關得依職權或應為繼承之人之聲請，經詳實調查後，有事實足認其確已因災死亡而未發現其屍體者，核發死亡證明書。

(105.04.13) 對於因災害失蹤之人，有事實足認其確已因災死亡而未發現其屍體者，法院得依利害關係人或檢察官之聲請，確定其死亡及死亡之時間。

⇒ 全球災害事件簿-梅姬颱風資訊 (nat.gov.tw) => 蘇花改環評

#### □ 中央災害防救會報 => 行政院中央災害防救會報-災害防救白皮書(ey.gov.tw)

⇒ 行政院中央災害防救會報-防災宣導 (ey.gov.tw)

⇒ 毒性化學物質災害防救-行政院環境保護署毒物及化學物質局(tcsb.gov.tw)

⇒ 緊急避難資訊-新北市三峽區公所 (ntpc.gov.tw)

⇒ <https://www.sanxia.ntpc.gov.tw/uploaddowndoc?file=sanxia05/202104280944070.pdf&filedisplay=新北市三峽區避難收容處所暨防災民生物資設置計畫.pdf&flag=doc>

#### □ 國土計畫：水土資源、海岸、濕地 => 國土計畫法、海岸管理法、濕地保育法

⇒ [https://ws.moi.gov.tw/001/Upload/OldFile/news\\_file/全國國土計畫懶人包.pdf](https://ws.moi.gov.tw/001/Upload/OldFile/news_file/全國國土計畫懶人包.pdf)

強化國土保育保安 => 國土復育促進地區、國土保育地區

⇒ 國土保育地區：依據天然資源、自然生態或景觀、災害及其防治設施分布情形加以劃設，並按環境敏感程度，予以分類。(第一、二類)

(豐富資源、重要生態、珍貴景觀或易致災條件)

⇒ 全國區域計畫對「環境敏感地區」定義係指對於人類具有特殊價值或具有潛在天然災害，極容易受到人為的不當開發活動之影響而產生環境負面效應的地區。

(第一、二級) (災害、生態、文化景觀、資源利用及其他等 5 類)

#### □ 地質法 => 地質敏感區：活動斷層 山崩與地滑 地下水補注 地質遺跡

#### □ 災害潛勢地圖 => 淹水、坡地災害 (山崩、土石流)、斷層與土壤液化、海嘯溢淹

#### □ Water Conservation, Soil Conservation, Coastal Conservation, Landscape Conservation

#### □ Key Issues => Geomorphology, Geology, Meteorology, Hydrology, and Land Use

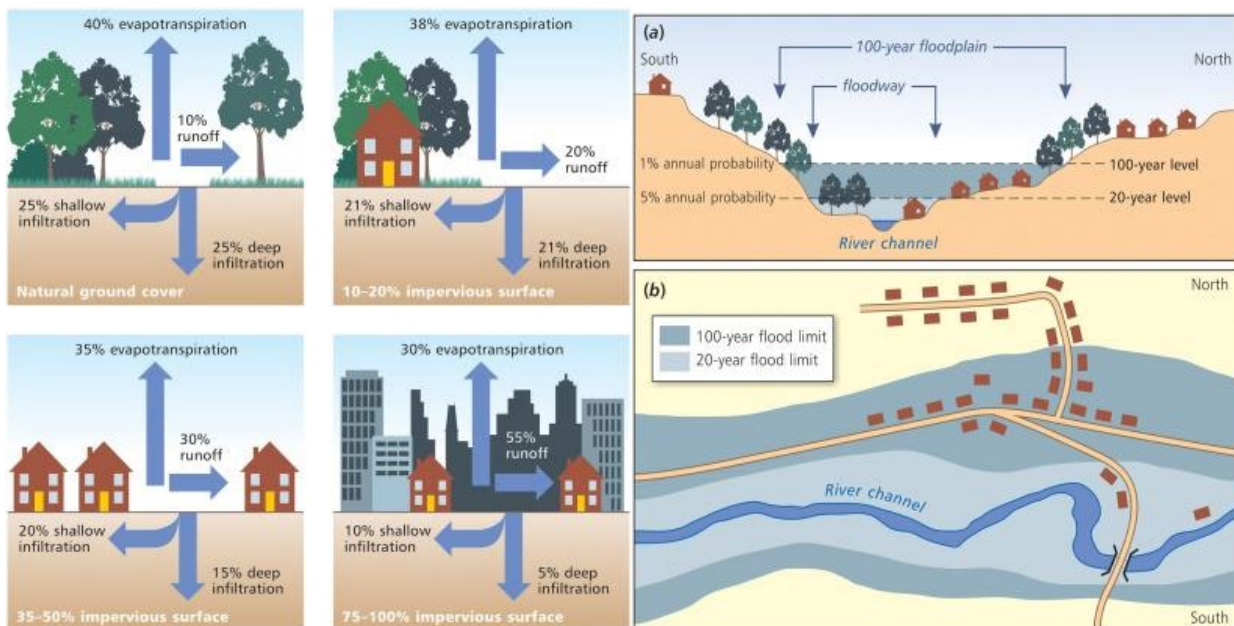
#### □ Managerial Issues => Regulation, Restriction, Watershed Treatment, and Restoration

#### □ Environmentally Sensitive Areas => Vulnerability vs. Resilience

⇒  $Vulnerability = f(Exposure, Sensitivity, Adaptive Capability) \Rightarrow Resilience$

- NATURAL HAZARDS IN URBAN AREAS

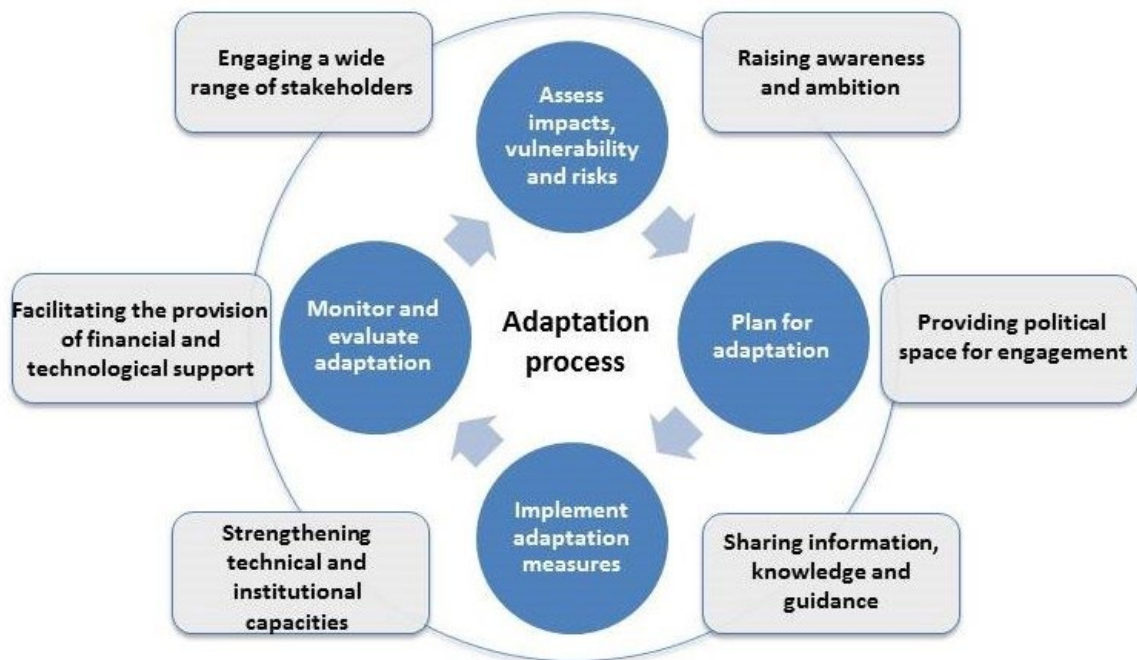
- Common Concerns: Floods and Atmospheric Hazard
- Flood Protection and Flood Control (S. Chp.11: p.312-322)
- Vulnerability Modification Adjustments of Floods (Adaptation; S. Chp.11: p.323-336)
  - ⇒ Community Preparedness; Forecasting and Warning; Land Use Planning
- Other Considerations
  - ⇒ Detention Tanks and Sewage Systems => Basement as Detention Facility
  - ⇒ Underground Flood System / [Underground Discharge Channel](#)
  - ⇒ Response to Emergent Deterioration of Air Quality => Na-Tech Disaster?
    - [空氣品質嚴重惡化警告發布及緊急防制辦法 \(111.03.03\)](#)



- ADAPTATION TO CLIMATE CHANGE

- Definition or Description
  - ⇒ Adaptation refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change. In simple terms, countries and communities need to develop adaptation solution and implement action to respond to the impacts of climate change that are already happening, as well as prepare for future impacts. (<https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/what-do-adaptation-to-climate-change-and-climate-resilience-mean>)
  - ⇒ Adaptation means anticipating the adverse effects of climate change and taking appropriate action to prevent or minimise the damage they can cause, or taking advantage of opportunities that may arise. It has been shown that well planned, early adaptation action saves money and lives in the future. (<https://www.eea.europa.eu/policy-documents/dg-clima-adaptation-to-climate-change>)
  - ⇒ Adapting to climate change means taking action to prepare for and adjust to both the current effects of climate change the predicted impacts in the future. ([https://ec.europa.eu/clima/policies/adaptation\\_en](https://ec.europa.eu/clima/policies/adaptation_en))

⇒ 氣候變遷因應法（草案）－氣候變遷調適：指人類系統，對實際或預期發生氣候變遷影響之調整適應過程，藉以緩和因氣候變遷所造成之損害，包括自然系統對實際發生氣候變遷影響之調整適應過程，必要時透過適當之人為介入，使其調整適應預期發生之氣候變遷影響。



□ [Climate Change 2022: Impacts, Adaptation and Vulnerability](#) (IPCC AR6 - WGII)

- ⇒ Adaptation plays a key role in reducing exposure and vulnerability to climate change. Adaptation in ecological systems includes autonomous adjustments through ecological and evolutionary processes. In human systems, adaptation can be anticipatory or reactive, as well as incremental and/ or transformational. The latter changes the fundamental attributes of a social-ecological system in anticipation of climate change and its impacts. Adaptation is subject to hard and soft limits.
- ⇒ [Figure SPM.1](#) (Figure 1.2, Figure TS.1): From climate risk to climate resilient development: climate, ecosystems (including biodiversity) and human society as coupled systems.
- ⇒ [Overlapping challenges](#)
  - Limited access to water, sanitation and health services
  - Climate-sensitive livelihoods
  - High levels of poverty
  - Weak leadership
  - Lack of funding

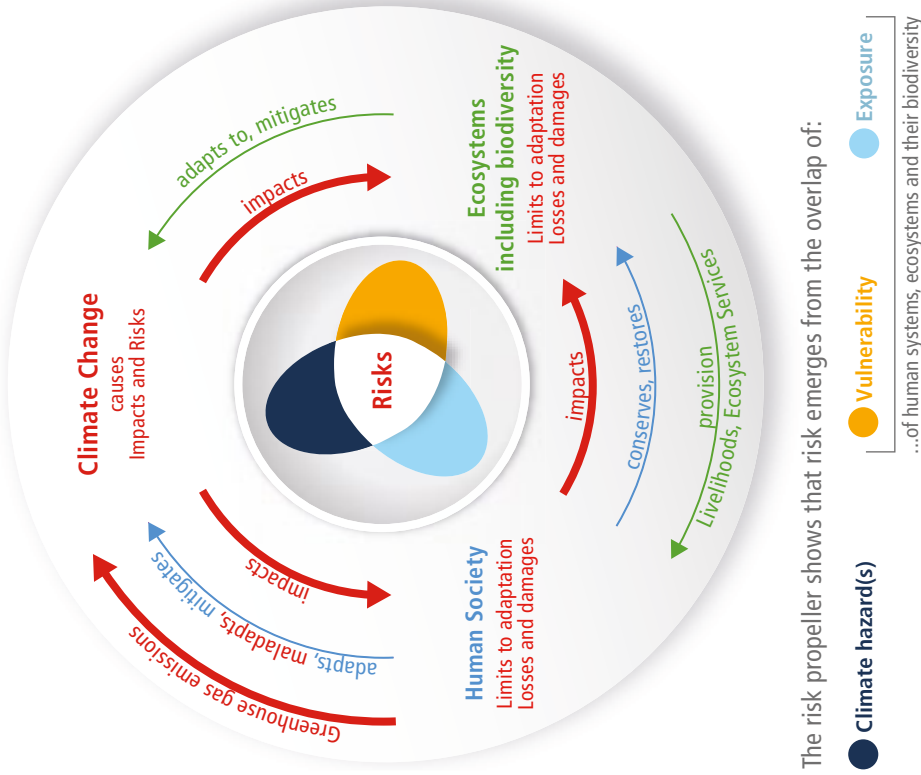
□ [國家氣候變遷調適行動方案\(107-111 年\)](#)

- ⇒ 八大領域＋能力建構：災害 維生基礎設施 水資源 土地利用 海洋及海岸 能源供給及產業 農業生產及生物多樣性 健康
- ⇒ 環保署依「溫室氣體減量及管理法」第 9 條第 1 項規定所擬訂的「國家因應氣候變遷行動綱領」，行政院於 106 年 2 月 23 日由正式核定，明確擘劃我國推動溫室氣體減緩及氣候變遷調適政策總方針，並啟動跨部門的因應行動，期能逐步健全我國面對氣候變遷調適能力，並致力達成我國溫室氣體長期減量目標，以確保國家永續發展。
- ⇒ 願景：制定因應氣候變遷策略，提高調適能力、加強回復力並降低氣候變遷衝擊所帶來的脆弱度，確保國家永續發展。
- ⇒ 總目標：持續精進我國氣候變遷調適能力，連結災害防救策略，扣接永續發展目標，以降低脆弱度並強化韌性。

● HOMEWORK ASSIGNMENT #4: IPCC AR6 (併入期中考試)

# From climate risk to climate resilient development: climate, ecosystems (including biodiversity) and human society as coupled systems

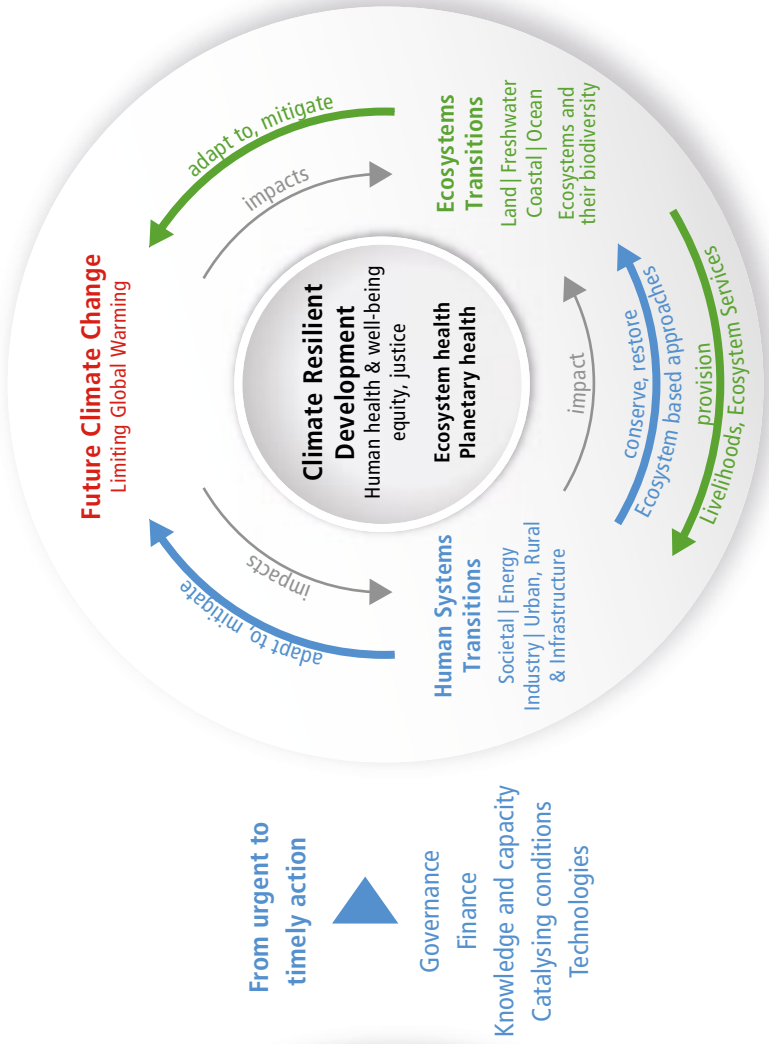
(a) Main interactions and trends



The risk propeller shows that risk emerges from the overlap of:

- Climate hazard(s)
  - Vulnerability
  - Exposure
- ...of human systems, ecosystems and their biodiversity

(b) Options to reduce climate risks and establish resilience



**Figure SPM.1 | This report has a strong focus on the interactions among the coupled systems climate, ecosystems (including their biodiversity) and human society.** These interactions are the basis of emerging risks from climate change, ecosystem degradation and biodiversity loss and, at the same time, offer opportunities for the future.

(a) Human society causes climate change. Climate change, through hazards, exposure and vulnerability generates impacts and risks that can surpass limits to adaptation and result in losses and damages. Human society can adapt to, maladapt and mitigate climate change, ecosystems can adapt and mitigate within limits. Ecosystems and their biodiversity provision livelihoods and ecosystem services. Human society impacts ecosystems and can restore and conserve them.

(b) Meeting the objectives of climate resilient development thereby supporting human, ecosystem and planetary health, as well as human well-being, requires society and ecosystems to move over (transition) to a more resilient state. The recognition of climate risks can strengthen adaptation and mitigation actions and transitions that reduce risks. Taking action is enabled by governance, finance, knowledge and capacity building, technology and catalysing conditions. Transformation entails system transitions strengthening the resilience of ecosystems and society (Section D). In a) arrow colours represent principle human society interactions (blue), ecosystem (including biodiversity) interactions (green) and the impacts of climate change and human activities, including losses and damages, under continued climate change (red). In b) arrow colours represent human system interactions (blue), ecosystem (including biodiversity) interactions (green) and reduced impacts from climate change and human activities (grey). [1.2, Figure 1.2, Figure TS.2]