Theme: Urban planning, heritage conservation, and "Build Back Better" (damage assessment for future preparedness, Resilience roadmap'…etc.)

Disaster-Resilient Integrated Urban Planning Concept

TIN TIN KYI
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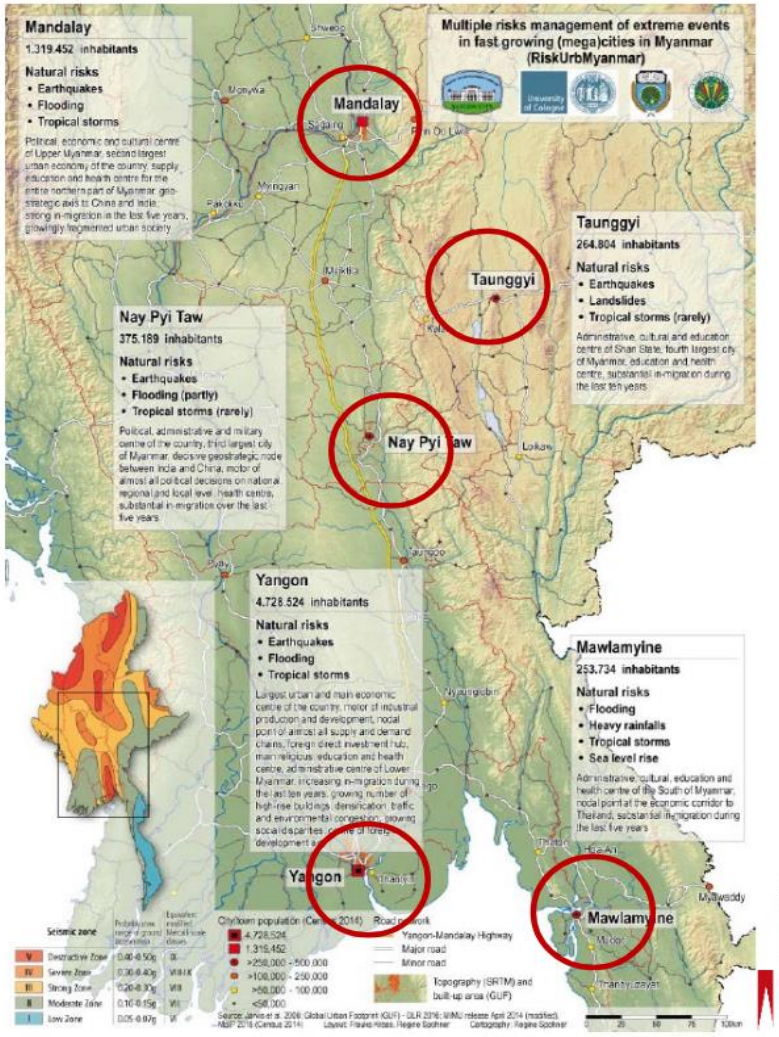
Yangon City Development Committee

5 April, 2026

Urbanization and Multiple Risks

Myanmar is threatened by numerous types of natural hazards;



People are at risk in almost every part of the country.

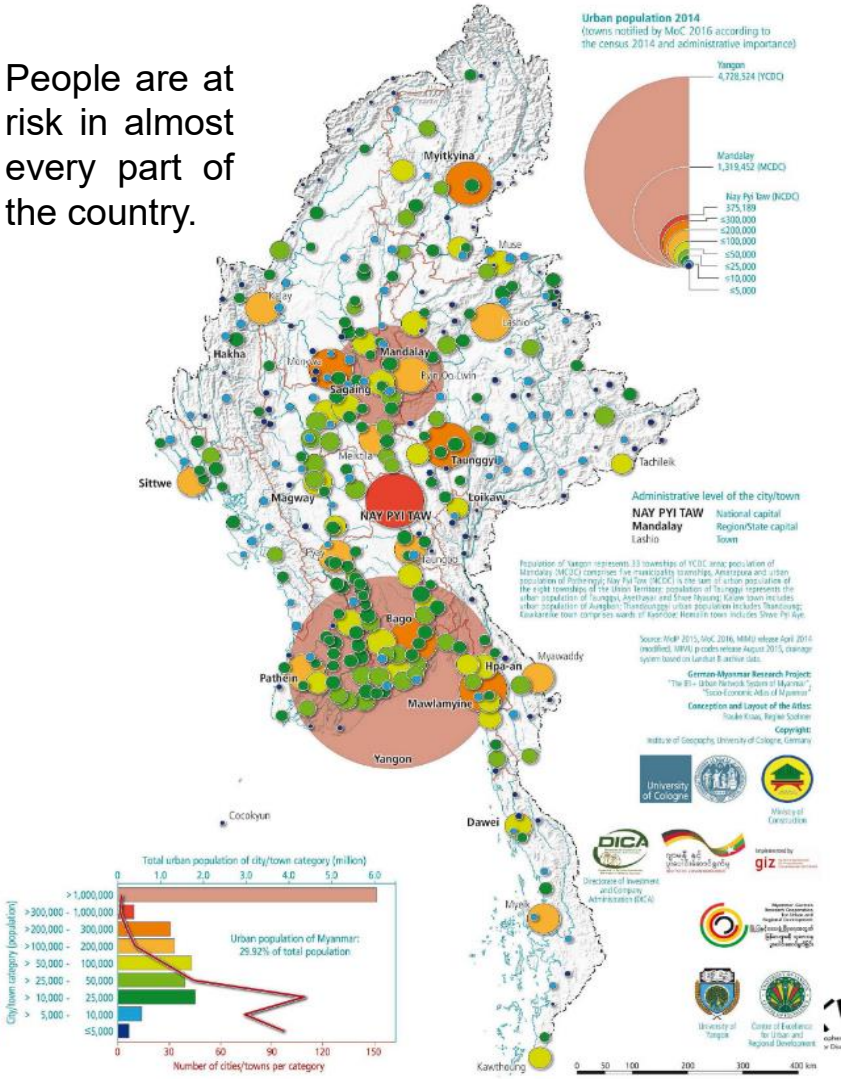


Fig. 2: Location and risk profile of the five selected Myanmar cities (own compilation)

- The major cities of Yangon, Mandalay and Nay Pyi Taw, as well as numerous regional towns (e.g. Taunggyi, Myitkyina and Bago), lie along **significant fault** lines, particularly the **1,500 km-long Sagaing Fault.**
- Coastal regions are at risk from **tsunamis** triggered by **seaquakes**. Along the coasts, in the Ayeyarwady Delta and in adjacent coastal regions, tropical cyclones frequently make **landfall,** bringing **heavy rain** and causing widespread **flash floods**.
- In mountainous regions, particularly on **steep slopes**, **landslides** pose a threat to infrastructure, towns and villages.
- Particularly in Myanmar´s dry zone, there is a risk of prolonged **heatwaves, droughts and fires.**

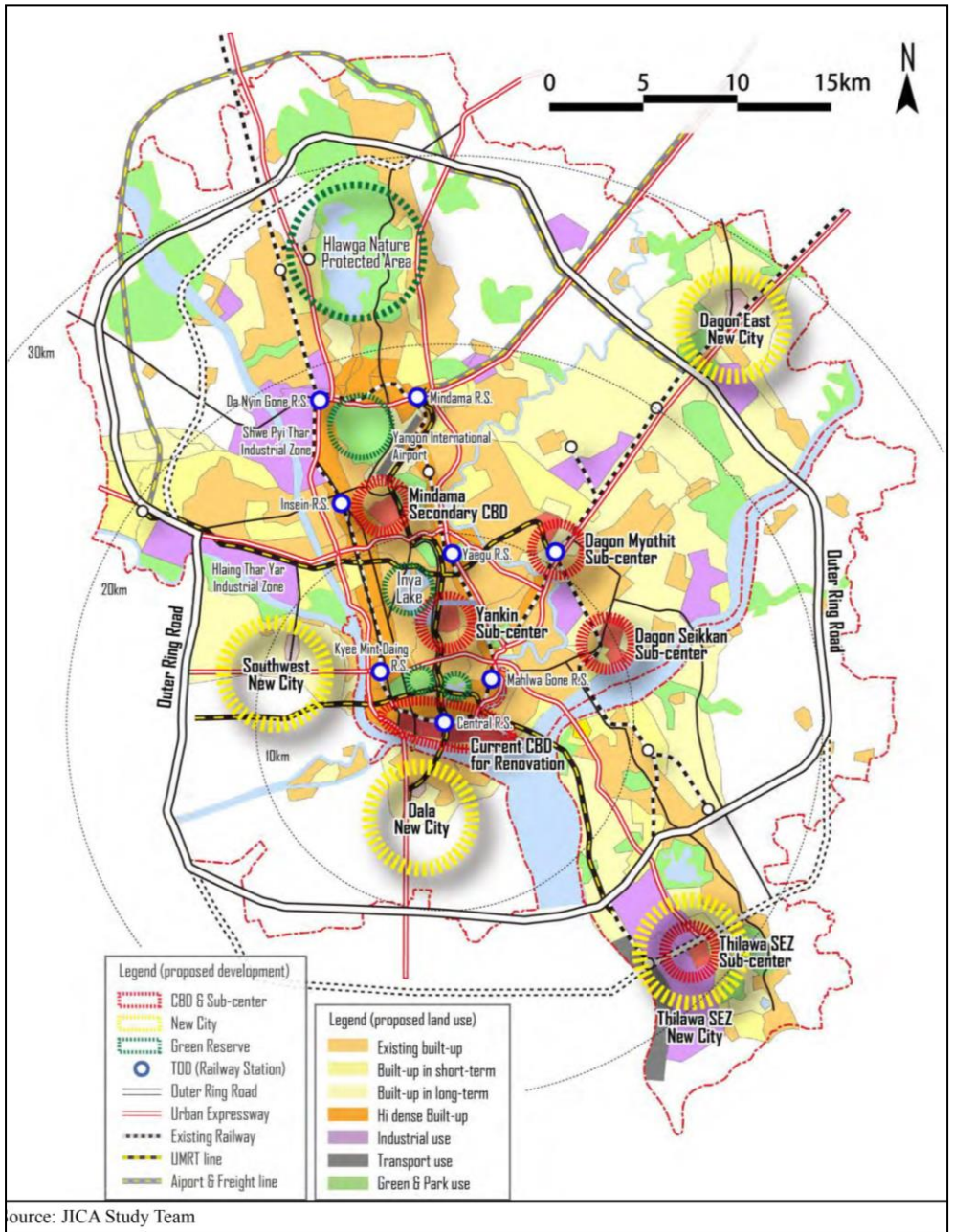
Kraas, Frauke, Regine Spohner, Aye Aye Myint (2017): Socio-Economic Atlas of Myanmar. Stuttgart

Urban Planning

- **A plan formulated with the short-term and long-term visions**
  - **including land-use, zoning, social and technical infrastructures, etc.,**

for urban expansion, new town development and urban renaissance to promote the sustainable development of the urban areas.

မြို့ပြစီမံကိန်းဆိုသည်မှာ မြို့ပြများ ရေရှည်စဉ်ဆက်မပြတ်ဖွံ့ဖြိုးရေး အတွက် မြေအသုံးချမှု၊ ဇုန်သတ်မှတ်မှု၊ လူမှုရေးနှင့် နည်းပညာပိုင်း ဆိုင်ရာအခြေခံအဆောက်အအုံ စသည်တို့ကို ပေါင်းစပ်ထည့်သွင်း၍ မြို့ပြချဲ့ထွင်ခြင်း၊ မြို့သစ်တည်ထောင်ခြင်း၊ မြို့ပြပြန်လည်ဆန်းသစ်ခြင်း စသည့် ကာလတို၊ ကာလရှည်မျှော်မှန်းရေးဆွဲသည့် မြို့ပြဖွံ့ဖြိုးရေး စီမံကိန်း (Urban Planning) ကို ဆိုလိုသည်။



ource: JICA Study Team

Urban Resilience

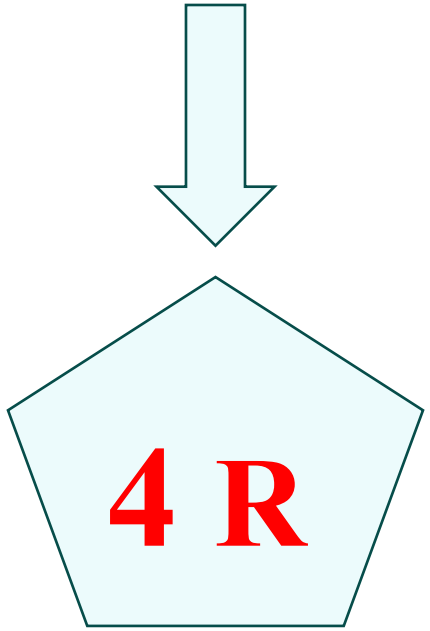
The ability of an urban system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management. (UNISDR 2005: online)

မြို့ပြစနစ်၊လူမှုဝန်းကျင်တစ်ခုသို့ ကျရောက်လာသောသဘာဝဘေးများ၏ သက်ရောက်မှုကို ဘေးအန္တရာယ်စီမံခန့်ခွဲမှုမှတစ်ဆင့် လိုအပ်သည့် အခြေခံအဆောက်အအုံများနှင့် ၎င်း၏လုပ်ဆောင်မှုများကို ထိန်းသိမ်းပြုပြင်ခြင်းဖြင့် အချိန်တိုအတွင်းကောင်းမွန်သောနည်းလမ်းဖြင့် ရင်ဆိုင် ကျော်လွှားပြန်လည်ကောင်းမွန်လာစေနိုင်သည့်အရည်အချင်းကို **မြို့ပြခံနိုင်ရည်ရှိမှု (Urban Resilience)** ဟုခေါ်သည်။

Critical Infrastructure Resilience

Resilience has become a very important concept in disaster research and disaster management.

Critical infrastructure comprises physical structures, facilities, networks and other assets, which provide services that are essential to the social and economic functioning of a community or society (UNISDR 2017b).



What makes a critical infrastructure resilient – four requirements (Zin Mar Than et al. 2023)**:**

(1) Robustness, strength of a system to withstand the disaster situation

(2) Rapidity, the speed to overcome the situation

(3) Redundancy, that allows for alternate options

(4) Resourcefulness, the capacity to mobilize resources; in particular capacity of identifying problems and establishing priorities

Zin Mar Than et al. (2023): Critical infrastructure in Yangon, Myanmar, in case of disaster: the readiness of providers. Journal of the Myanmar Academy of Arts and Science (MAAS) XX (2): 125-139.

Build Back Better

The term is more popular after the Aceh tsunami in 2004/ Based on the UN report written by Bill Clinton in 2006

Giving an idea how the recovery after the tsunami should have to take place / Include in the priority 4 of the Sendai Framework.

- **Build?** reconstruction of physical structures (i.e. housing, infrastructure) In addition, mental and emotional – soft skill

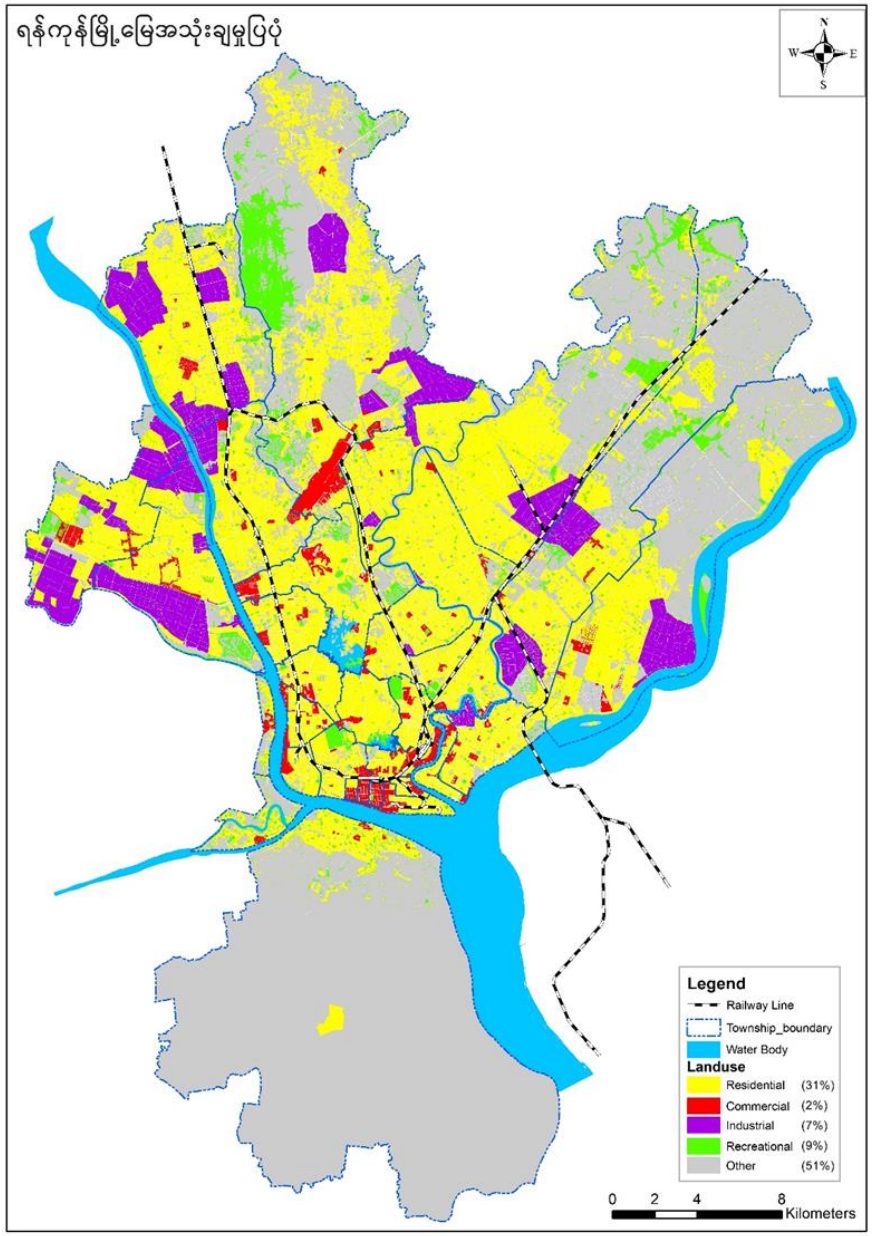
- **Better?**
  safer, more efficient, faster, more inclusive, more solid, better than at the moment, back to normal life (e.g. Kennedy et al. 2008; Maly 2017)

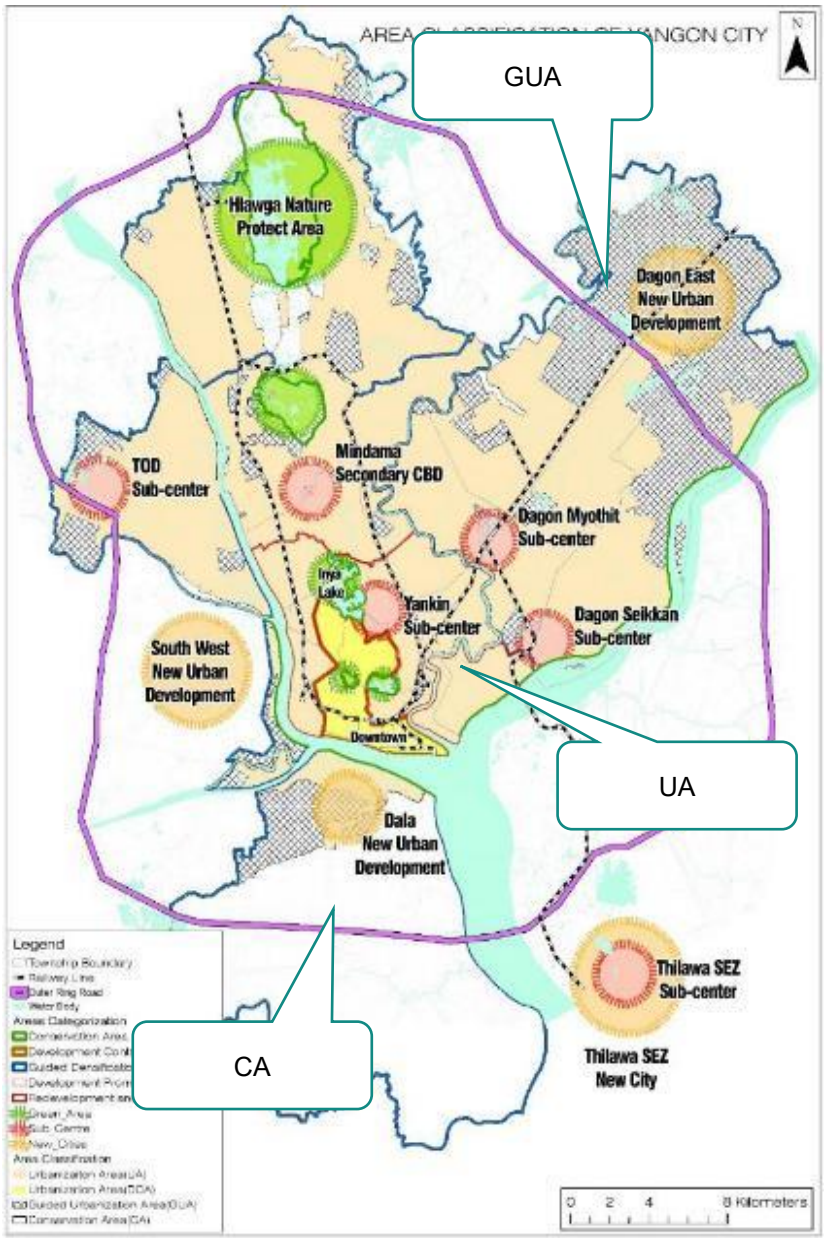
- **Time span Build Back?**
  The activity build back better does not start after disaster, but already (a long time) before = preparing and being aware of the disasters (= lesson learned)

  (i.e. plans) → extended process of 'BBB' to 'BBBB'
  (= Build Back Better, even Before Disaster' (Okada 2021)

Kennedy J; Ashmore J; Babister E; Kelman I (2008): The meaning of 'Build Back Better': Evidence from post-Tsunami Aceh and Sri Lanka. Journal of Contingencies and Crisis Management, 16(1):24-36.
Maly E (2017): Rethinking "Build Back Better" in housing reconstruction: A proposal for "People Centered Housing Recovery". In: IOP: 10th Aceh International Workshop and Expo on Sustainable Tsunami Disaster Recovery (AIWEST-DR 2016) (IOP Conference Series-Earth and Environmental Science, 56): 012025.
Okada, N (2021): Build back better, even before disaster – Adaptive design of communicative process, place and practice. In: Chatterji M; Gangopadhyay P (eds): New frontiers in conflict management and peace economics: With a focus on human security contributions to conflict management, peace economics and development, volume 29: 27-38.

Land Use Map and Area Classification Map

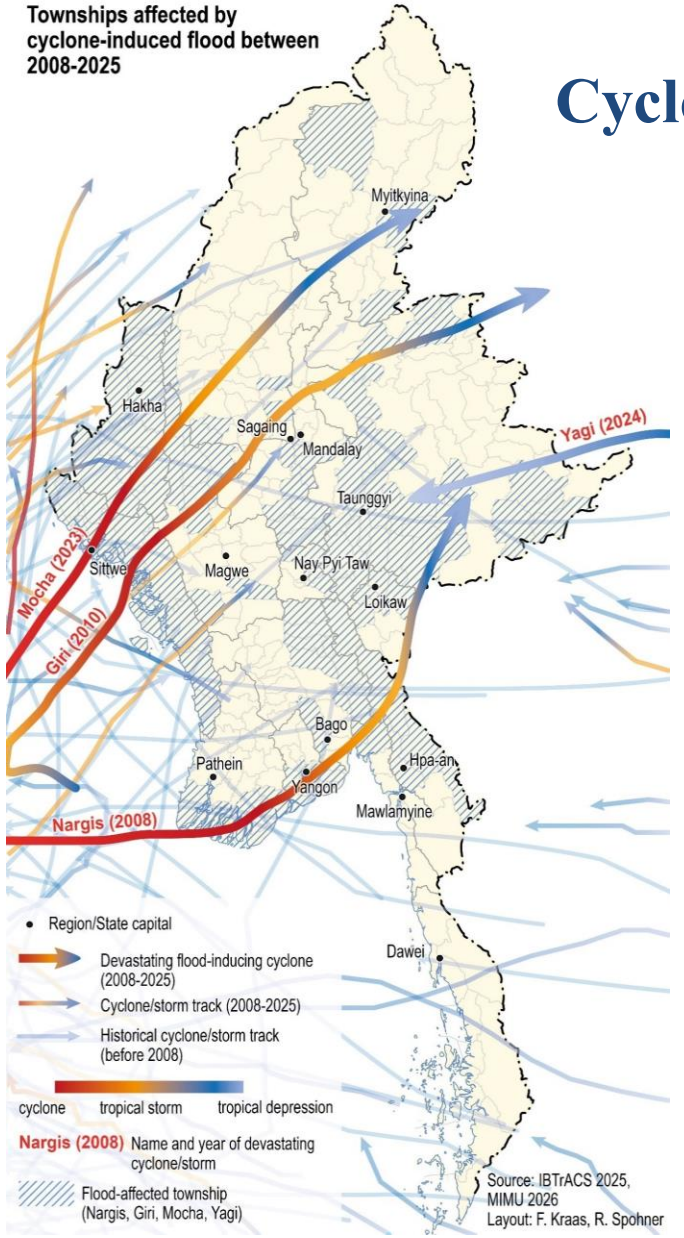




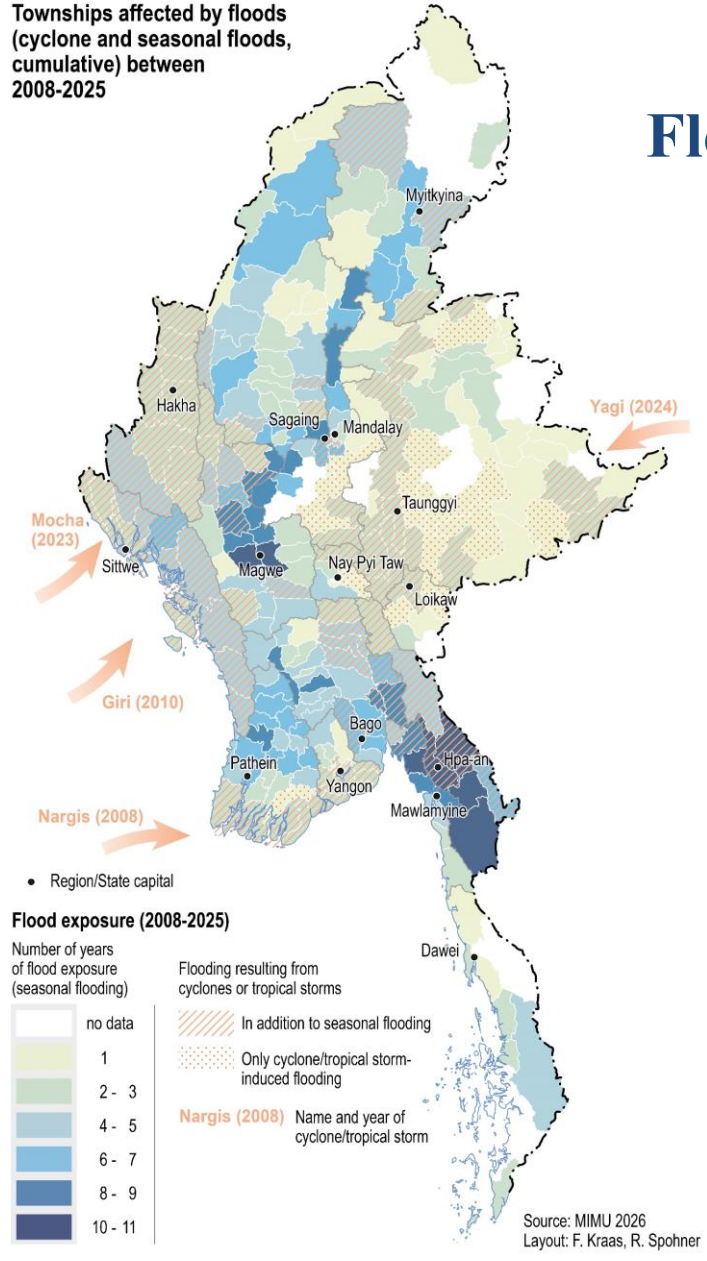
- မြို့ပြဖွံ့ဖြိုးပြီးဧရိယာ (Urbanization Area – UA)
- လမ်းညွှန်ချက်ပါဝင်သည့်မြို့ပြဖွံ့ဖြိုးပြီးဧရိယာ (Guided Urbanization Area – GUA)
- ထိန်းသိမ်းစောင့်ရှောက်ရန်ဧရိယာ(Conservation Area–CA)

Disaster-Resilient Integrated Urban Planning Concept

Cyclone

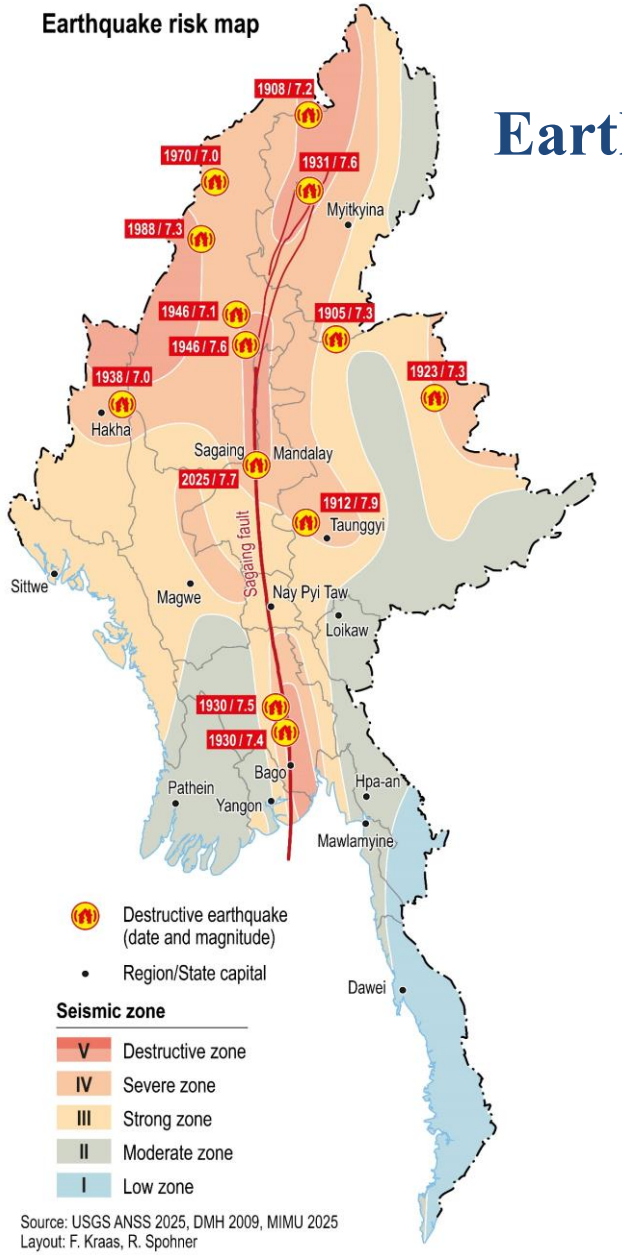


Flooding

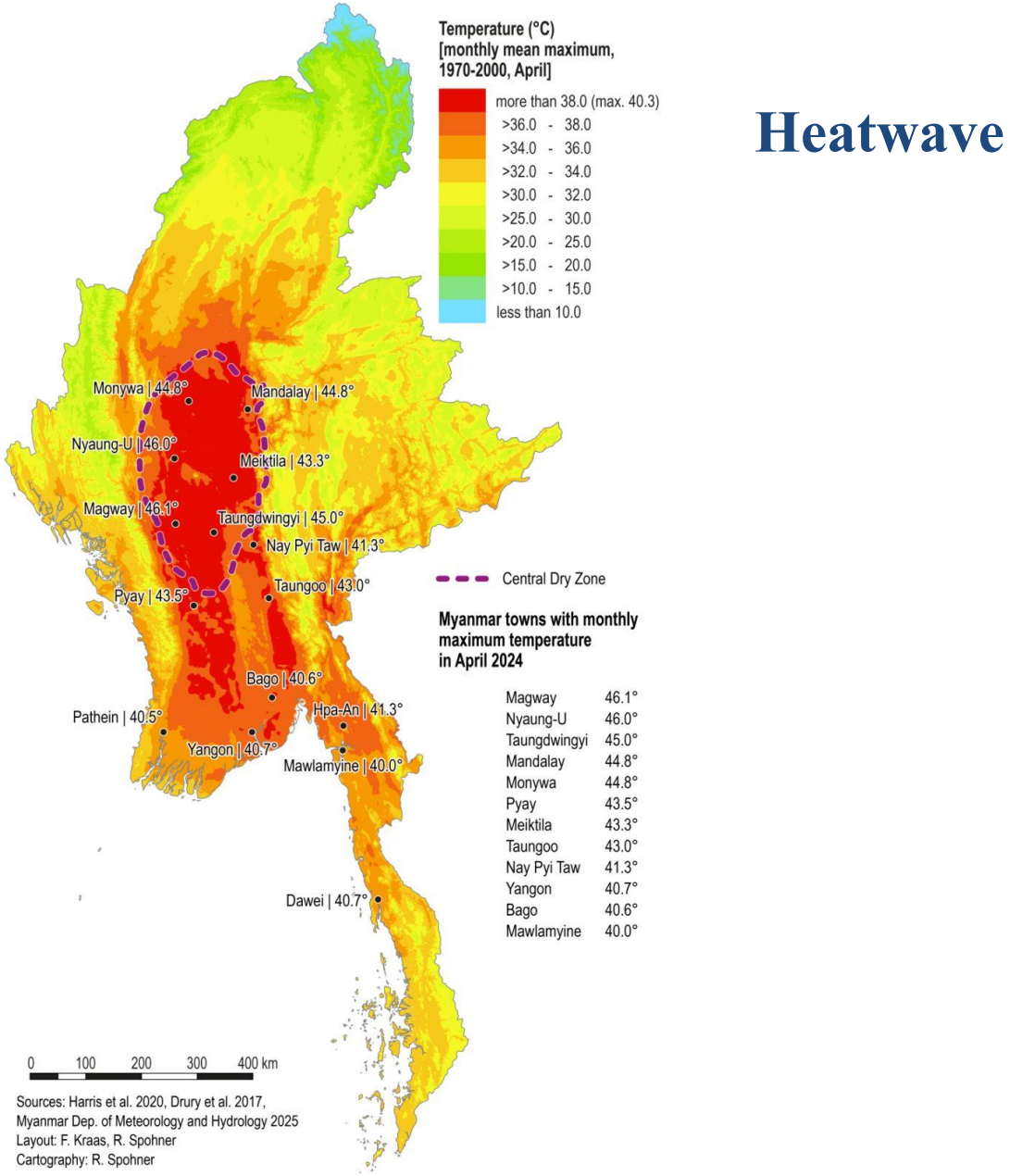


Disaster-Resilient Integrated Urban Planning Concept

Earthquake

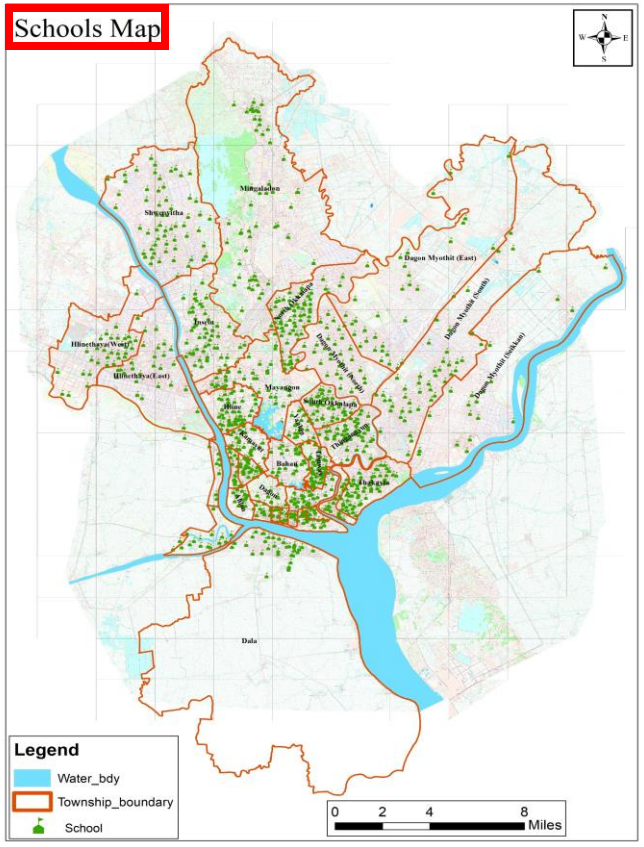


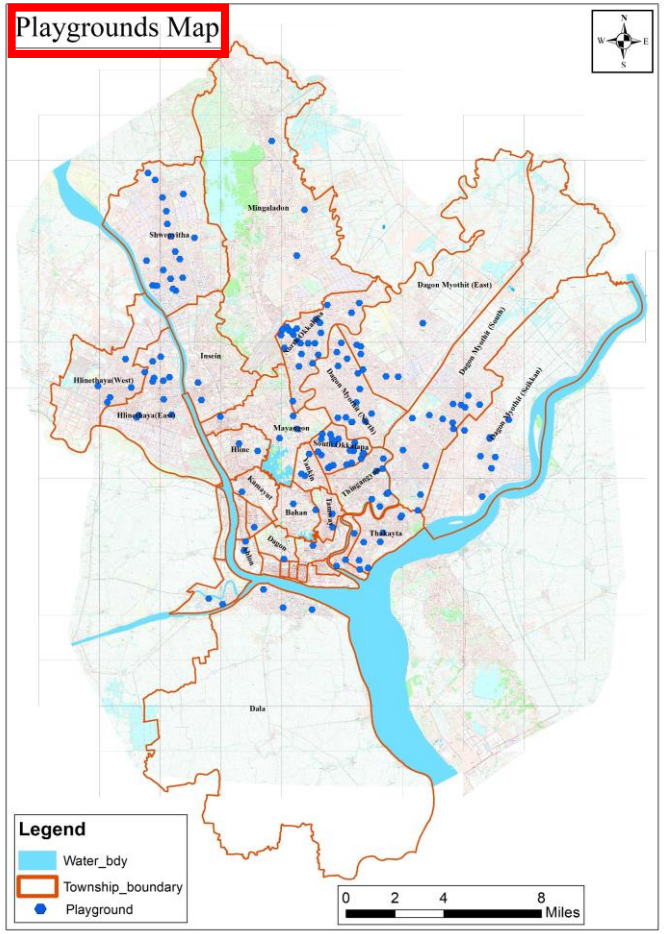
Heatwave

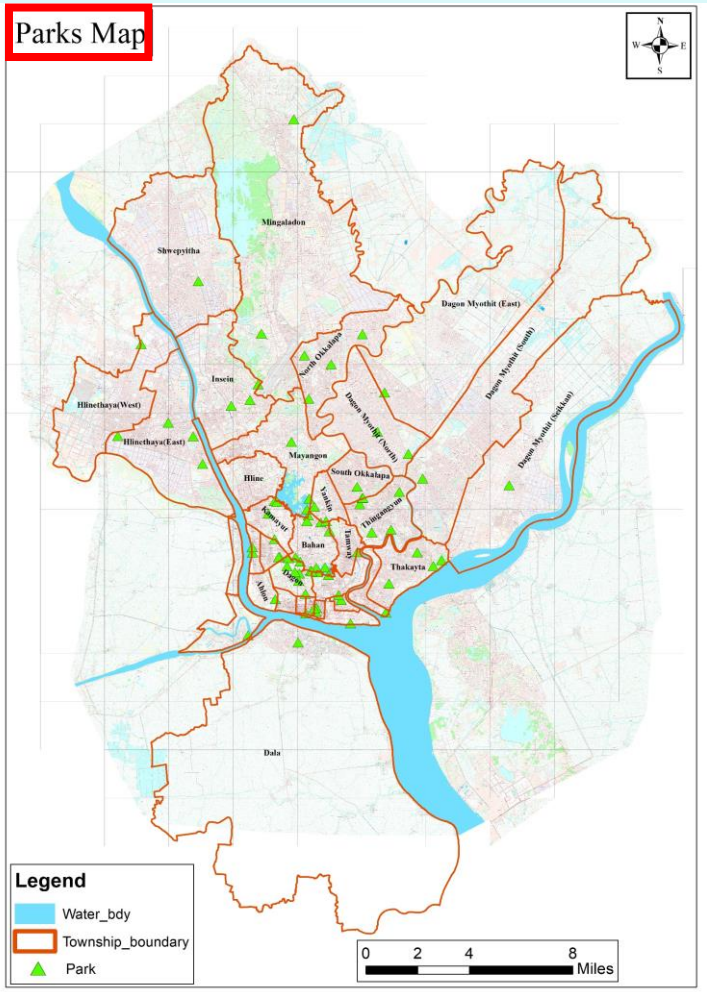


Disaster-Resilient Integrated Urban Planning Concept

YANGON







- ✓ Analyze the road network assessment around schools
- ✓ Analyze how vacant land inside the school compound is spacious and how many people can be fit in this vacant land
- ✓ Data collection of usage and types of building, no of storey

Integrated Multiple Disaster Risk Management (IMDRM): Focus areas of the MYrisk project *

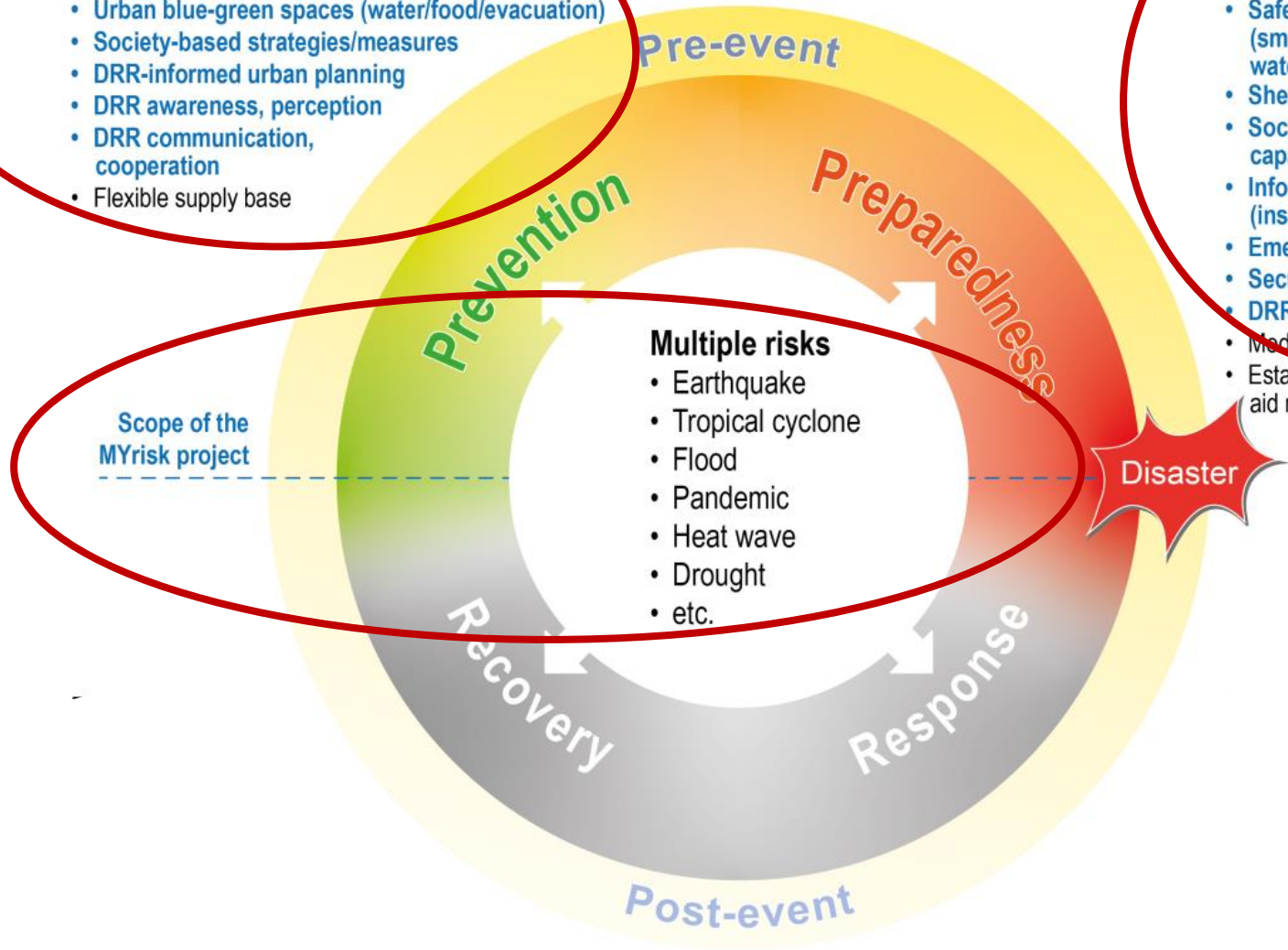
* highlighted in blue colour

Prevention

- Infrastructure-based strategies/measures
- Nature-based strategies/measures
- Urban blue-green spaces (water/food/evacuation)
- Society-based strategies/measures
- DRR-informed urban planning
- DRR awareness, perception
- DRR communication, cooperation
- Flexible supply base

Preparedness

- Urban multiple risk mapping
- Emergency planning
- Safeguarding critical infrastructure (small clinics/pharmacies, water/food providers)
- Shelter points
- Social and institutional education/ capacity enhancement
- Information flyers/vinyls (instructions, contacts)
- Emergency kits/bags
- Securing personal documents
- DRR Apps
- Media training (information dissemination)
- Establishment of international aid networks



Sources: Own draft, adapted to the MYrisk project, based on Aguirre-Ayerbe et al. 2018 (modified), Tay et al. 2022 (modified)

Draft: F. Kraas, R. Spohner

Development Vision

Urban Structure of Greater Yangon, 2018

"Sub-center with Green Isle System"

1 second CBD, **5** Sub-center, **4** New Town

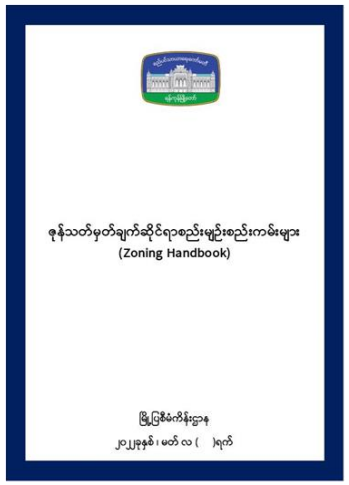
Urban development (25nos)

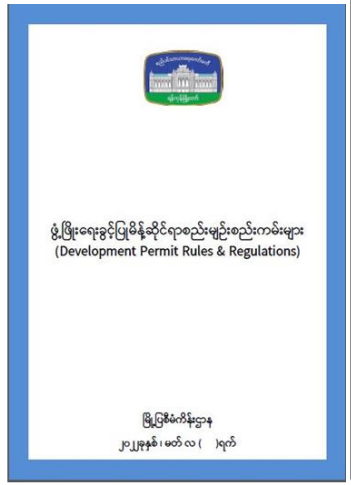
- Urban Development and Management Project
- Capacity Building Project
- Urban Landscape and Heritage Conservation
- People Parks and Green Area Project

Infrastructure development (16nos)

- Water Supply
- Sewerage
- Drainage & Flood
- Solid Waste
- Electricity
- Telecommunication
- Disaster Risk Management

Integrated Urban Planning Concept

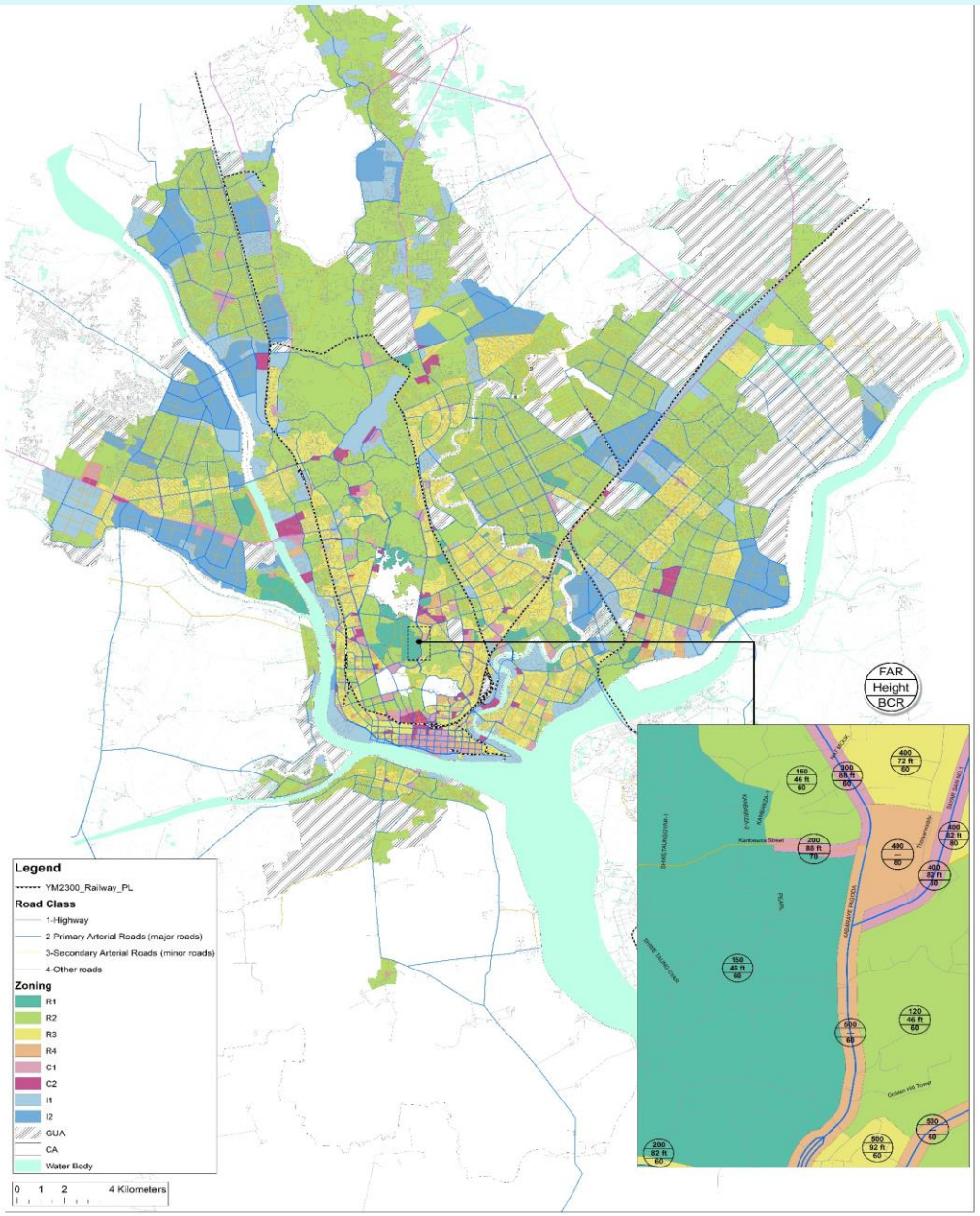




Zone Categories

- **Residential Zone**
  - Exclusive low-density Residential Zone/R1
  - Low-density Residential Zone/R2
  - Mid-density Residential Zone/R3
  - High-density Residential Zone/R4
- **Commercial Zone**
  - Neighborhood Commercial Zone/C1
  - Commercial Zone/C2
- **Industrial Zone**
  - General Industrial Zone/I1
  - Exclusive Industrial Zone/I2

** Regular update of urban plans with most recently obtained risk information **



Natural Hazards
https://doi.org/10.1007/s11069-022-05226-w

ORIGINAL PAPER

Disaster preparedness and resilience at household level in Yangon, Myanmar

Sophie-Bo Heinkel[1,4] · Benni Thiebes[2] · Zin Mar Than[1] · Toe Aung[3] · Tin Tin Kyi[3] · Win Lei Mar[3] · Saw Sandar Oo[3] · Christian Miller[4] · Marlene Willkomm[5] · Win Maung[6] · Zin Nwe Myint[7] · Khin Khin Soe[7] · Regine Spohner[1] · Frauke Kraas[1]

Received: 20 July 2021 / Accepted: 20 January 2022

Abstract
Resilience has become important in disaster preparedness and response. Unfortunately, little is known about resilience at the household level. This study presents the results of a survey into individual and household level preparedness to disaster events in Yangon, Myanmar, which is prone to natural disasters such as tropical cyclones, flooding, and earthquakes. The study aimed to understand societal resilience and to provide information that could be used to develop a holistic framework. In four different Yangon townships, 440

2023 ERDKUNDE Vol. 77 · No. 4 · 303–321

Cities at risk: Flood risk, public awareness, institutional preparedness and risk communication in Yangon, Myanmar

Cities at risk in Southeast Asia

While in 1990 about 2.3 billion of the world's population (43%) lived in urban areas, in 2030 more than 5.1 billion people (56%) are expected to live as urban residents in cities worldwide (WBGU, 2016; UN DESA, 2019). In Southeast Asia, since about 2020, more than half of the population is living in urban areas. Countries like Indonesia, Malaysia, the Philippines, Singapore and Thailand are highly driven by urbanisation (UN DESA, 2019). Even in still relatively rural countries like Cambodia, Laos, Myanmar and Vietnam the trend towards accelerating urbanisation is evident (UN DESA, 2019).

Urbanisation is fundamentally transforming societies and landscapes. Cities in developing countries, currently transforming at a high pace, are particularly complex systems with high transformation dynamics. Megacities and large metropolises provide key functions for growing global and local networks as they are centres of power, innovation and decision-making processes as well as transit points for products and

TV and radio, print and electronic media, cultural properties as well as buildings and places with identity-forming functions) (BBK, 2020) - is a major challenge to government institutions and public administration. Social fragmentation, increasing poverty, and advanced vulnerability, complicate the provision of comprehensive infrastructure and services (Bohle and Sakdapolrak, 2008; Kraas et al., 2019). This leads to momentous vulnerability of at least increasing parts of the urban population with respect to crises and disasters. Thus, fast-growing cities in developing countries can be regarded as "global risk areas" (Kraas, 2003). Rapid and uncontrolled urbanization, including informal settlements, require adequate approaches of disaster risk reduction (DRR) as well as sustainable preparedness and agile disaster response mechanisms (UNDRR, 2005), let alone appropriate laws and regulations. Against this background, improving resilience with resilience education and with improved communication within the administration, with and between the different stakeholders in society, including the citizens, is of crucial importance for successful risk management, disaster response management

lcad. Arts Sci. 2020 Vol. XVIII. No.5B

TITUTIONAL PREPAREDNESS FOR MULTIPLE RISKS IN YANGON, MYANMAR

Zin Mar Than[1], Tin Tin Kyi[2], Frauke Kraas[3]

Abstract

Myanmar is among the most vulnerable states with respect to many kinds of natural hazards. Since 2008, when the Tropical Cyclone Nargis had such a disastrous impact, public awareness to natural hazards has been increasing. It was thus not unexpected that in 2009 the Myanmar Action Plan on Disaster Risk Reduction was introduced (last updated in 2017) and in 2013 the Natural Disaster Management Law was passed. In the Action Plan of 2017, 32 priority actions were established and related responsibilities defined for different administrative and spatial levels. Structures were defined for the specific functions and duties, and in particular for the methods and forms of collaboration between the institutions on different levels. But implementation remains weak. Moreover, the goals set for the first phase (until 2020), for instance that disaster management bodies at all levels should then be fully functional, seem somewhat optimistic.

Based on this situation, the joint Myanmar and German research project aims to understand

DISASTER RISK PERCEPTION AND PREPAREDNESS OF HOUSEHOLDS IN YANGON, MYANMAR: DISASTER EXPERIENCES, SOCIO-DEMOGRAPHIC FACTORS AND SPATIAL VARIATION

Zin Mar Than, Hlaing Maw Oo, Toe Aung, Tin Tin Kyi, Saw Sandar Oo, Win Lei Mar, Marlene Willkomm, Christian Miller, Stefan Martini, Zin Nwe Myint, Khin Khin Soe, Win Maung, Sophie-Bo Heinkel, Benni Thiebes, Regine Spohner and Frauke Kraas

Universities Research Journal 2019, Vol. 12, No. 5

Risks Awareness and Preparedness in Kamayut and Bahan Townships, Yangon, Myanmar

Khin Khin Soe[1], Zin Mar Than[2], Wai Mon Aung[3] & Frauke Kraas[4]

Thank for your kind attention!

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