The promise and peril of deploying artificial intelligence for climate security

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ARTIFICIAL INTELLIGENCE FOR CLIMATE SECURITY

Possibilities and Challenges

KYUNGMEE KIM AND VINCENT BOULANIN

- Can Artificial Intelligence (AI) play a role in addressing the security challenges posed by climate change? If so, how? What are the entailed risks?

- The report provides:
  - An overview of opportunities that AI offers in tackling the emerging and urgent challenges, with concrete examples of existing initiatives; and
  - Safeguarding measures for ensuring diversity and equity, and by attention to the accountability of AI-generated or -assisted insights.
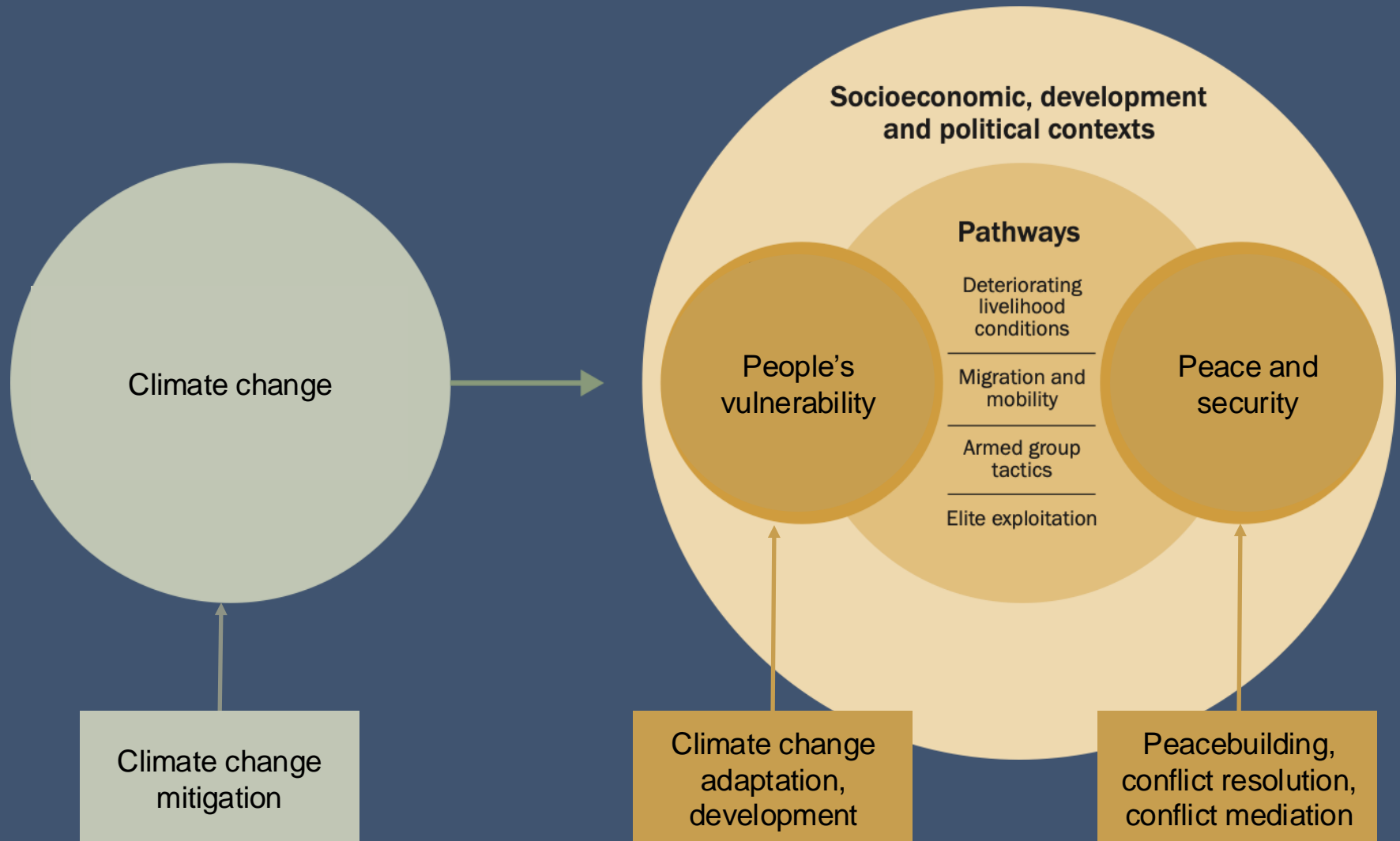
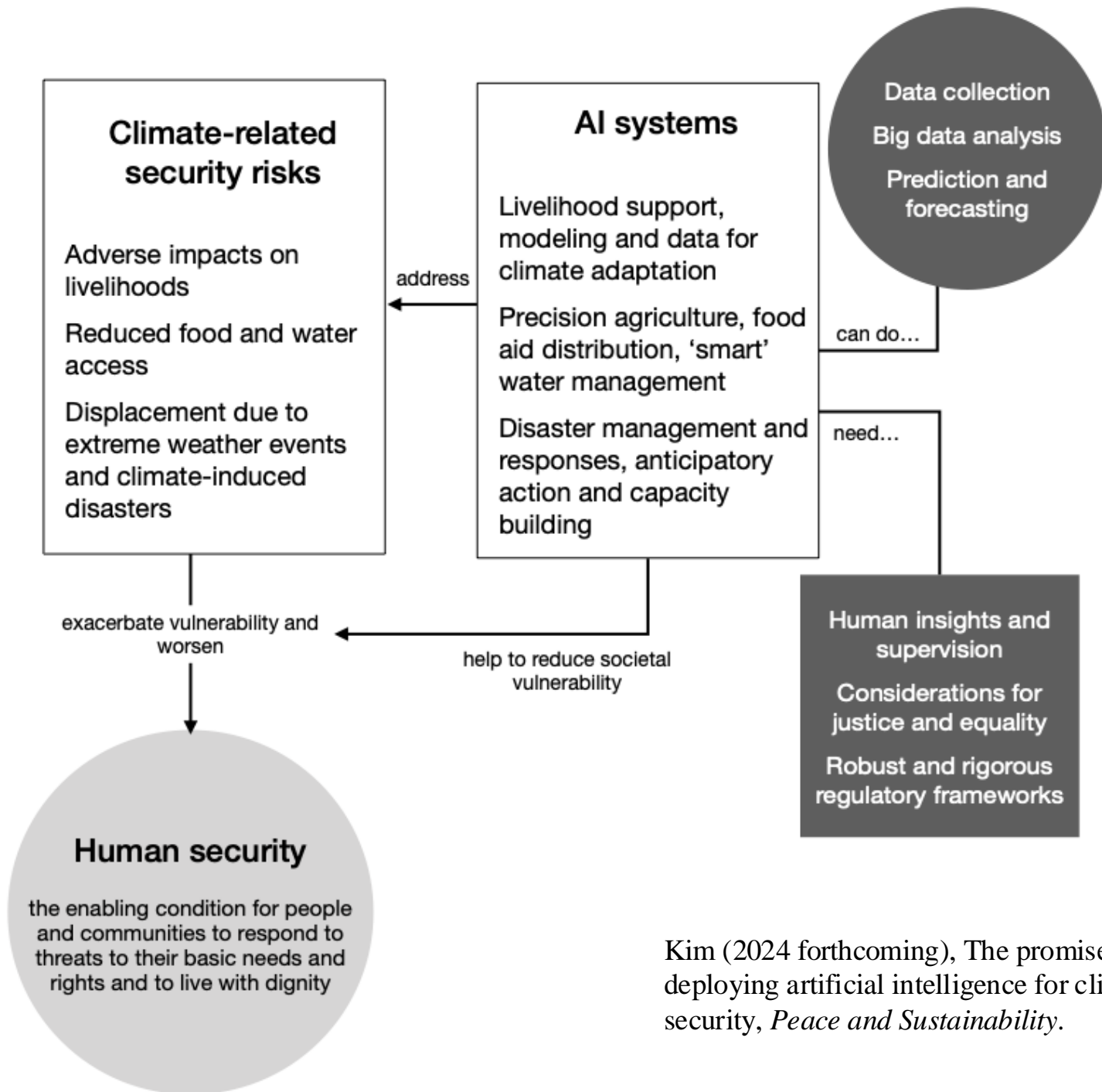# What are the linkage between climate change and security?

Climate-Conflict Nexus

- Extreme weather and climate events can prolong and/or escalate violent conflict and, by implication, aggravate humanitarian consequences of conflict. The relevance of climate for conflict is expected to increase with climate change.

- Climate change may alter resource distribution and cause supply chain disruptions and compound other societal risks, which have the potential to trigger (geo)political conflict.

- Violent conflict is an important driver of social and climate vulnerability.

- Social responses to climate change (e.g., maladaptation) also can increase conflict risks.

Climate insecurity and policy responses

Climate change

Socioeconomic, development and political contexts

People's vulnerability

Pathways

Deteriorating livelihood conditions

Migration and mobility

Armed group tactics

Elite exploitation

Peace and security

Climate change mitigation

Climate change adaptation, development

Peacebuilding, conflict resolution, conflict mediation

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Climate-related security risks

Adverse impacts on livelihoods

Reduced food and water access

Displacement due to extreme weather events and climate-induced disasters

AI systems

Livelihood support, modeling and data for climate adaptation

Precision agriculture, food aid distribution, 'smart' water management

Disaster management and responses, anticipatory action and capacity building

Data collection

Big data analysis

Prediction and forecasting

Human insights and supervision

Considerations for justice and equality

Robust and rigorous regulatory frameworks

address

can do...

need...

exacerbate vulnerability and worsen

help to reduce societal vulnerability

Human security

the enabling condition for people and communities to respond to threats to their basic needs and rights and to live with dignity
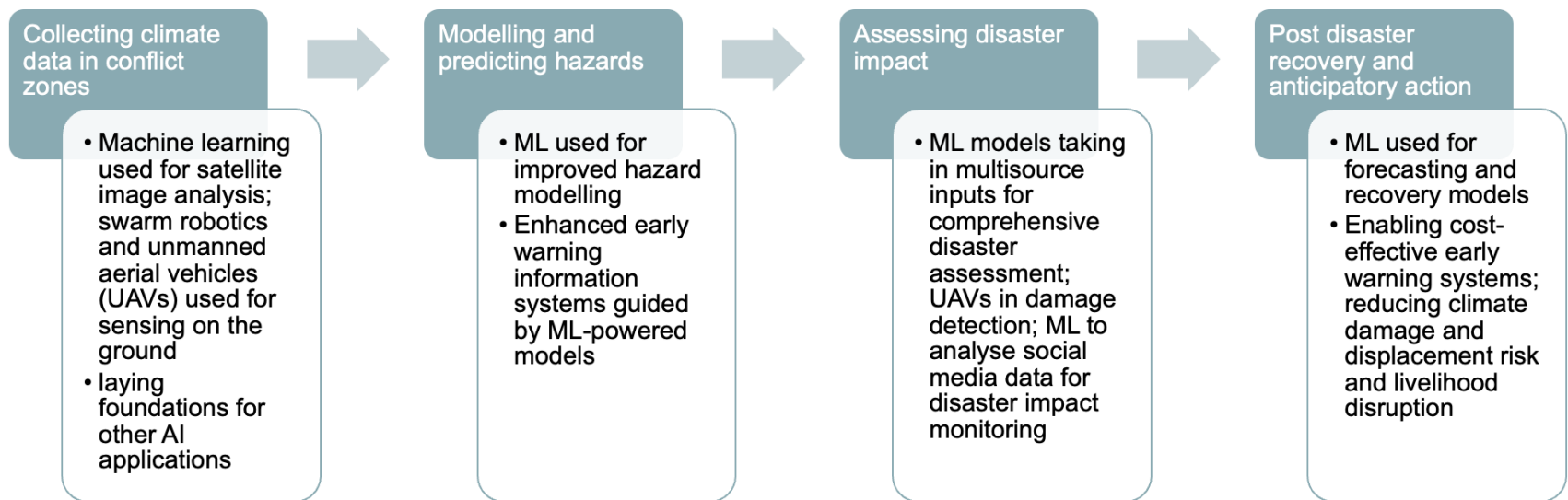
Kim (2024 forthcoming), The promise and peril of deploying artificial intelligence for climate security, *Peace and Sustainability*.

Responding to climate-related disasters

Collecting climate data in conflict zones

- Machine learning used for satellite image analysis; swarm robotics and unmanned aerial vehicles (UAVs) used for sensing on the ground
- laying foundations for other AI applications

Modelling and predicting hazards

- ML used for improved hazard modelling
- Enhanced early warning information systems guided by ML-powered models

Assessing disaster impact

- ML models taking in multisource inputs for comprehensive disaster assessment; UAVs in damage detection; ML to analyse social media data for disaster impact monitoring

Post disaster recovery and anticipatory action

- ML used for forecasting and recovery models
- Enabling cost-effective early warning systems; reducing climate damage and displacement risk and livelihood disruption

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Unpacking climate-related security risks

- Example: UNEP Strata
  - Climate hazards and socio-economic stressor mapping tools
  - Climate, violence and conflict events, demographic and socio-economic data
  - Hotspot maps of climate-related security risks
  - Convergence of evidence approach
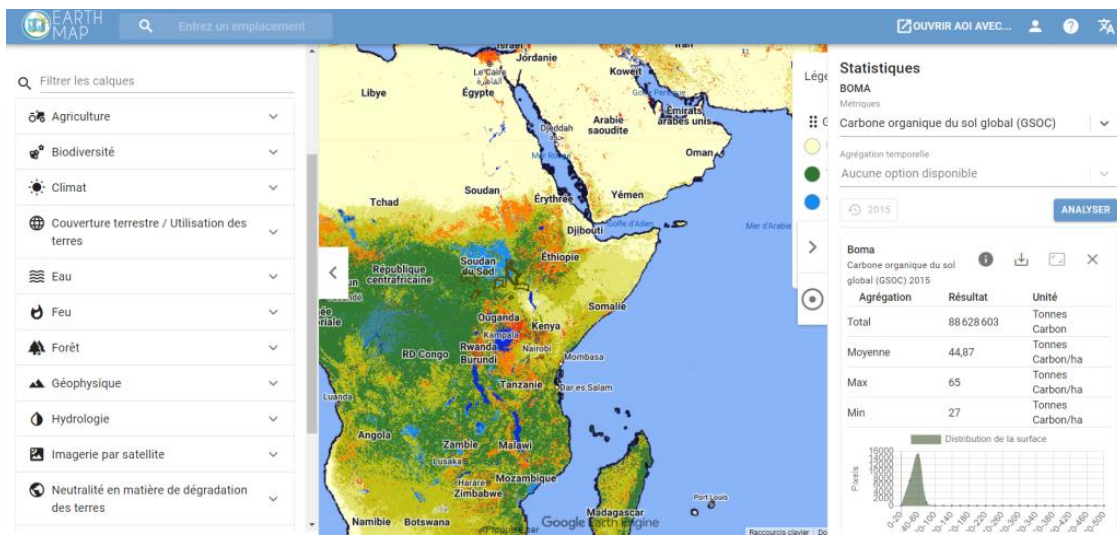
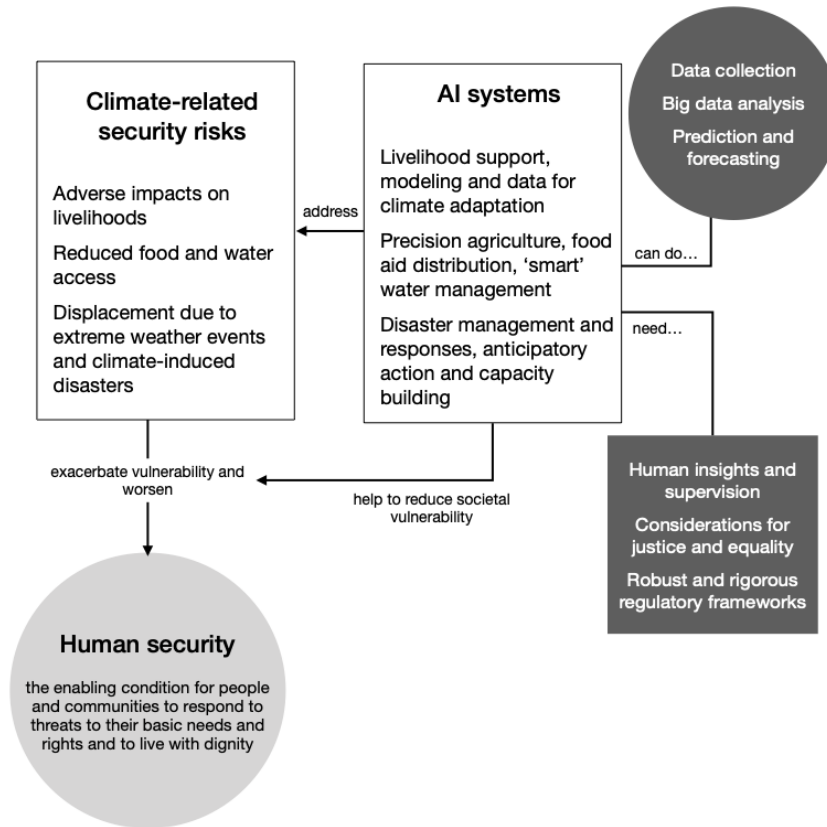# Detecting climate change-related grievances and tensions

- Tracking grievances on public service provision
  - Social media data analysis
  - Large-language model based consultations
- Sentiment analysis and public opinion surveys
- Prompt conflict mediation and service improvement
- Useful feedback on government and private service providers

Risks of AI-based systems

- "Do no harm"
- Algorithmic biases
  - Unintended errors vs systematic discrimination
- Risks of automated analysis
- Forecasting – risk-based approaches
- Knowledge-to-decision needs to be reconsidered
- Inequality exacerbated?

Thank you!
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