Self Introduction (CV)

Specialized research field is Applied System Analysis
(PhD, University of Tokyo, Graduate School of Macro Systems Science)

Working at the National Institute for Environmental Studies since 1991.
Established the GCP Tsukuba International Office in 2001.

Contributed to the IPCC "Climate Change and Land Use" Report and
6th Assessment Report WG3 "Urban System" chapter as a Lead Author.

Currently studying climate resilient sustainable Urban System Design

IIASA (Visiting Researcher), Institute of Statistical Mathematics (Visiting
Professor), Committee member of Science Council of Japan (Environment)
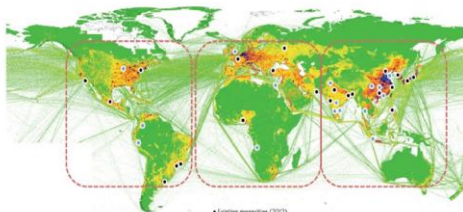
Lecturing "Sustainable Urban Systems" at Georgia Institute of Technology,
University of Tokyo and Keio University.

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Key-messages:

Cities are important for investigating emissions, drivers and mitigation options

- Cities are the growing sources of CO2 emissions
- Cities are responders to climate change
- City emissions reporting enables comparisons
- City emission data accuracy is not high

Duren, R.M and C.E.Miller (2012), Measuring the Carbon Emissions of Megacities, *Nature Climate Change* 2, 560–562 (2012) doi:10.1038/nclimate1629.

Agendas for Sustainable Urban Systems Design

Decarbonization
- Renewable Energy
- Smart Grid
- Smart Mobility
- Technology Assessment
- Land use–Transport model   CO2 Map
- Zero Carbon Cities

Climate Resilience
- Heat and Flood risks
- COVID risks
- Wellbeing
- Navigation
- Bigdata & AI
- Adaptation measures   洪水リスク

Optimization based on analysis of synergies and trade-offs in cities

Regional symbiosis
- Use of local resource
- Independency
- Society5.0
- GeoDesign

Local Revitalization
- New Smart Life-style
- Sharing Economy
- Ecological Tourism
- Work＋Vacation

Urban System Design fuses various future smart technologies by integrating Architecture and Transport systems for improving Human Wellbeing

Diverse Urban Environment in Tokyo

Large-scale redevelopments in contrast with existing human-scale urban environment

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Diverse Urban Environment in Tokyo

High density, mixed-use, human-scale environment

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Diverse Urban Environment in Tokyo

Typical urban sprawl resulting in the mix of land use and vulnerable infrastructure
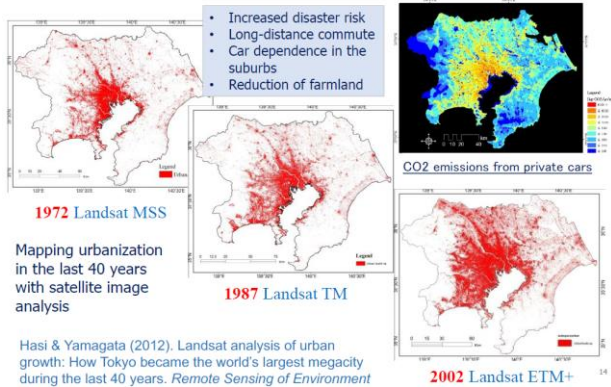
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Diverse Urban Environment in Tokyo

Spontaneous generation of unmanaged buildings and plots due to population decline and aging in the edge of suburban area

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Problems due to population concentration and suburbanization in the Tokyo metropolitan area

- Increased disaster risk
- Long-distance commute
- Car dependence in the suburbs
- Reduction of farmland

CO2 emissions from private cars

1972 Landsat MSS

Mapping urbanization in the last 40 years with satellite image analysis

Hasi & Yamagata (2012). Landsat analysis of urban growth: How Tokyo became the world's largest megacity during the last 40 years. *Remote Sensing of Environment*

1987 Landsat TM

2002 Landsat ETM+

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Creating Comfortable Community Spaces with Next Generation AEV

Empty walk path   Car congestion

IoT sensors   Share office

NG AEV   Community space

Provision of various services by NG AEV

[Currently]
Although the sidewalks were improved by the road widening work, however the traffic volume of vehicles increased and the pedestrian comfort might rather decreased.

[In the future]
Next-generation NG AEV can be operated at low speed and safely in orbit. No need for full paving, greening makes the street a comfortable community space