Integrated Resource Management

(Water / Energy / Food Security / Land Use) in Asian Cities:

THE URBAN nexus

1st Phase 2013-2015
2nd Phase 2016-2019

Financed by:
BMZ
(German Federal Ministry for Economic Cooperation & Development)

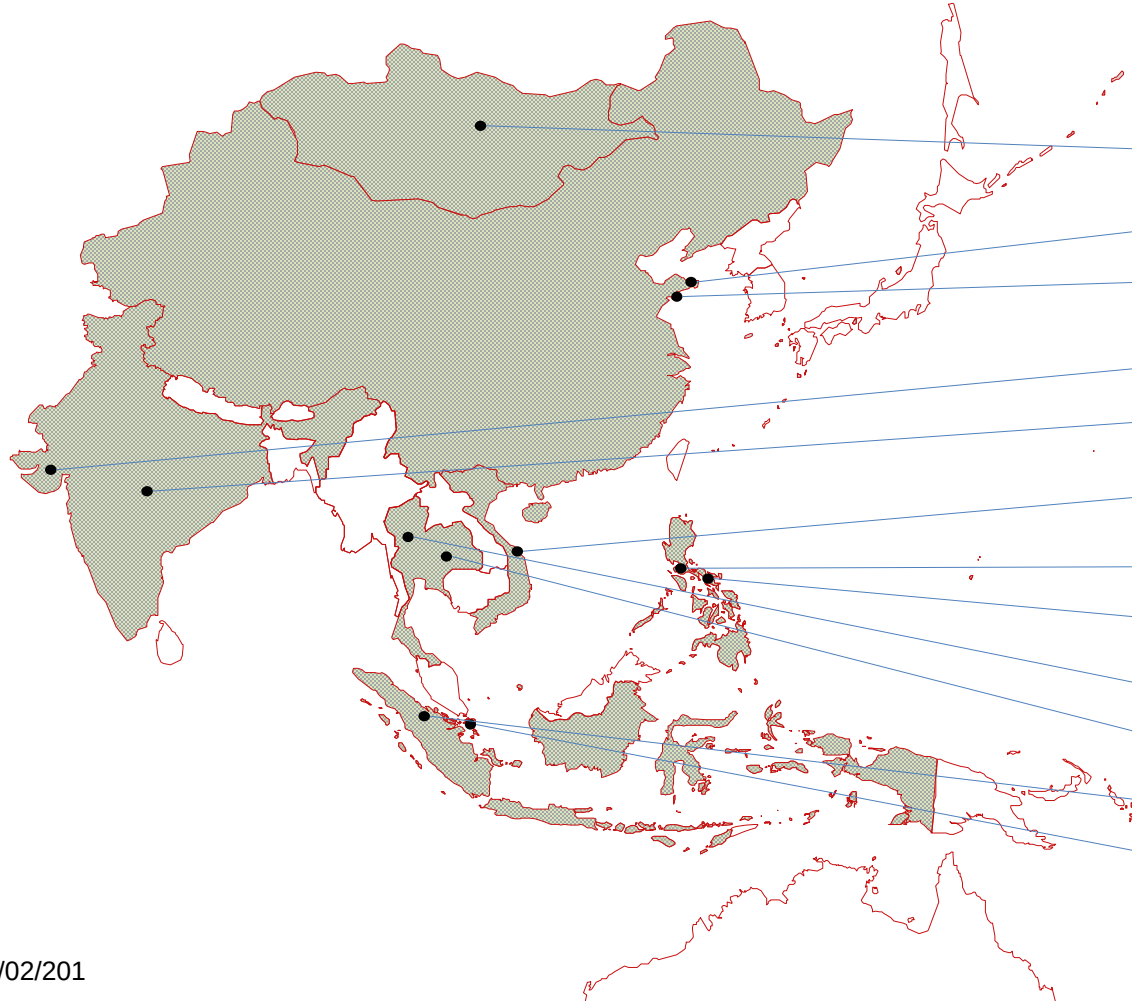
Implemented by:
GIZ
German International Cooperation

Political Partner:
UN ESCAP
United Nations Economic & Social Commission Asia Pacific

Implementation Partner:
Local Governments for Sustainability
(ICLEI South Asia & South East Asia)

THE URBAN nexus

12 Partner Cities in 7 Countries



Ulaanbaatar	*Mongolia*
Weifang Rizhao	*China*
Rajkot Nagpur	*India*
Da Nang	*Vietnam*
Santa Rosa Naga City	*Philippines*
Chiang Mai Korat	*Thailand*
Pekanbaru Tanjungpinang	*Indonesia*

THE URBAN nexus Rationale

- **Demand for fresh water, energy and food will rise** between 40-50% by 2030
- **Security of supply** in one sector is inextricably linked to security of supply in each of the other two sectors.

Cities:

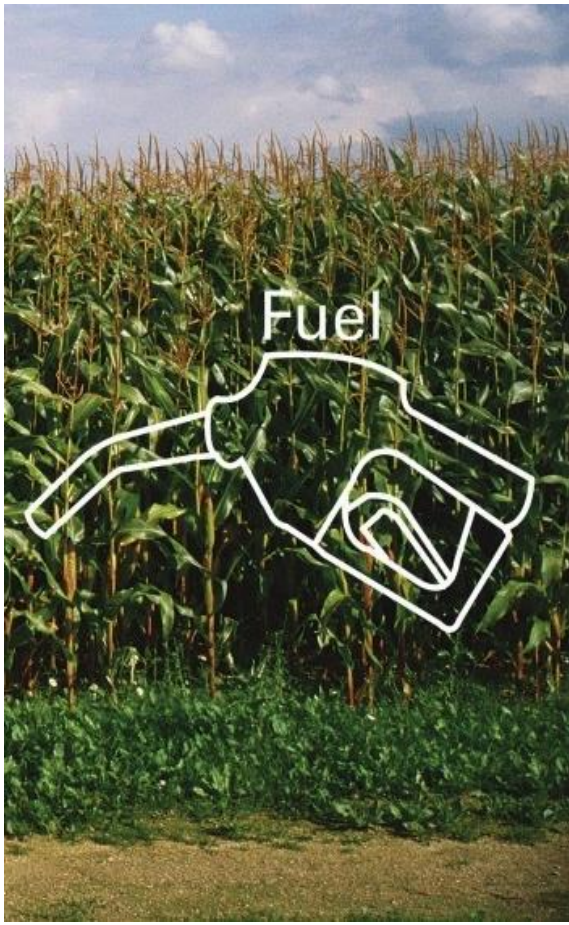
- **2 / 50 / 75 / 80 "Formula" (challenges and opportunities)**

(Land, population, greenhouse gas emissions, GDP)

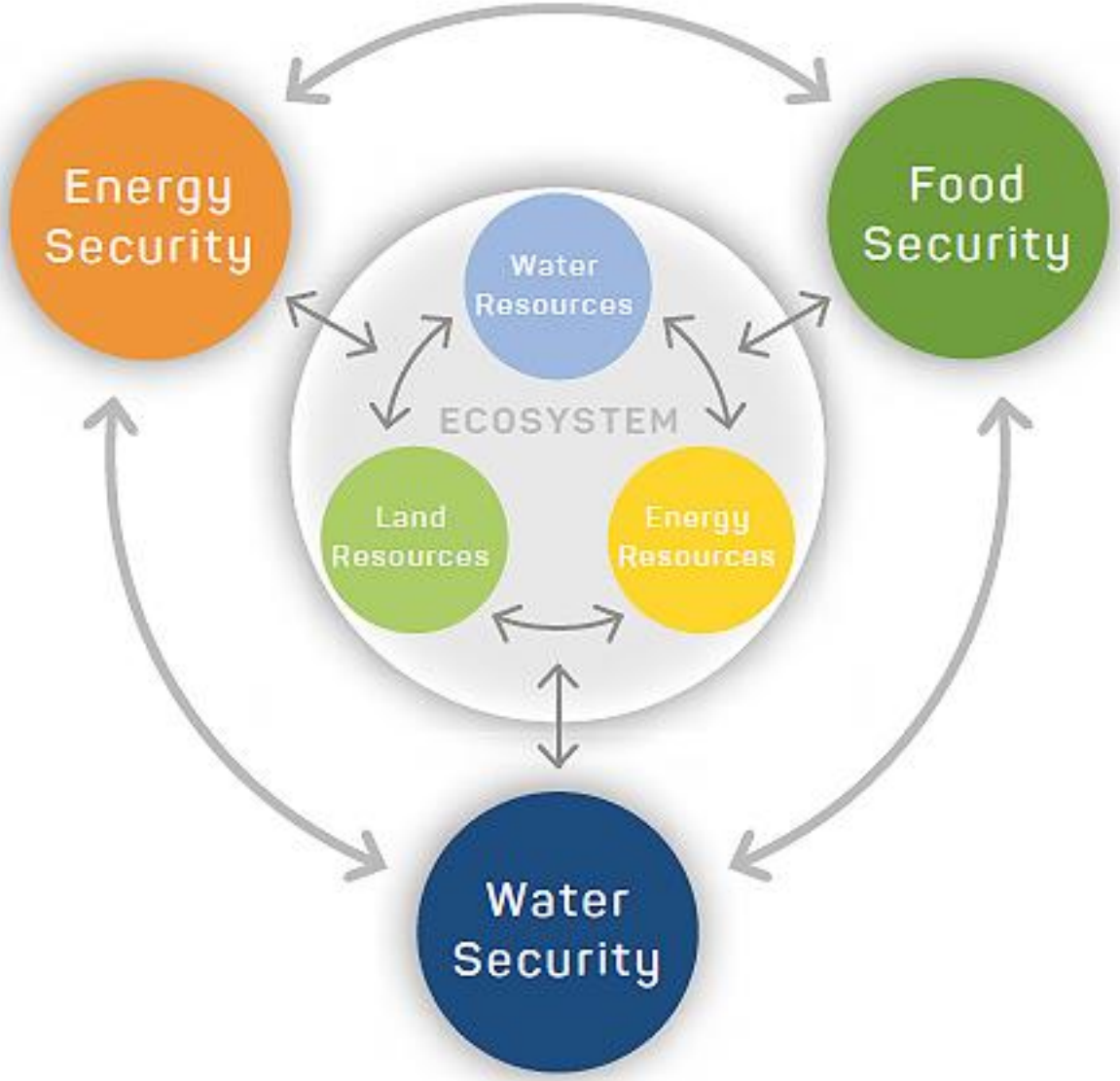
- **Cities** are the **power machines** of the world!
- **Cities** play a **leadership** role to address **climate** change and in achieving the **SDGs** and the **New Urban Agenda (NUA)!**
- **Cities should be empowered (financially, human resources, mandates)**

THE URBAN nexus approach highlights:

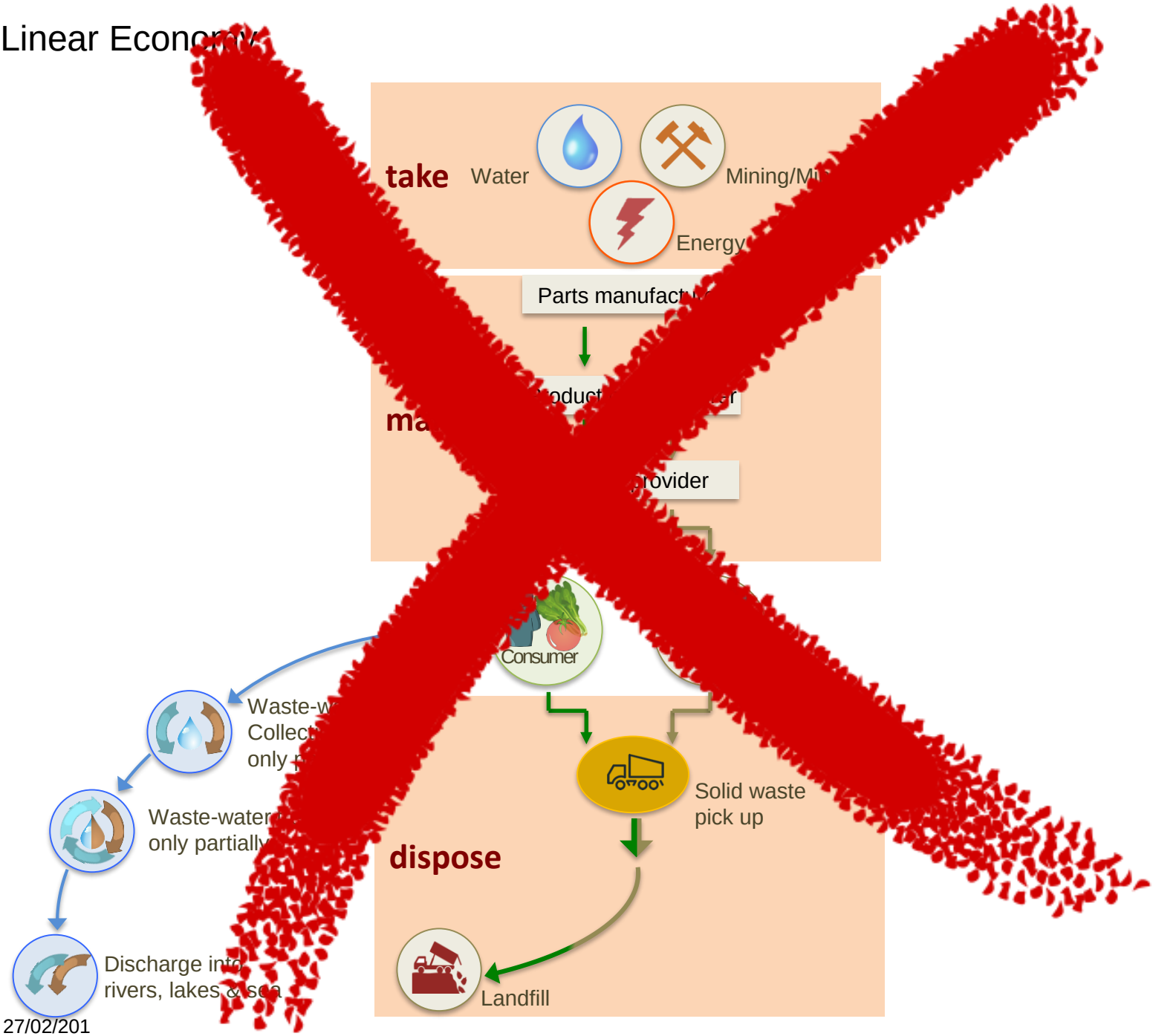
- the **interdependencies** between water, energy and food security
- the **synergies** and **competing uses** of water, land and energy-related resources.
- a **fundamental shift**, from a sectoral to a **cross-sectoral, integrated** approach
- the **Nexus approach challenges existing structures**, sector policies and procedures.
- The three "supply securities" **water, energy and food** to be **protected** and **used in a balanced manner**.



THE URBAN nexus

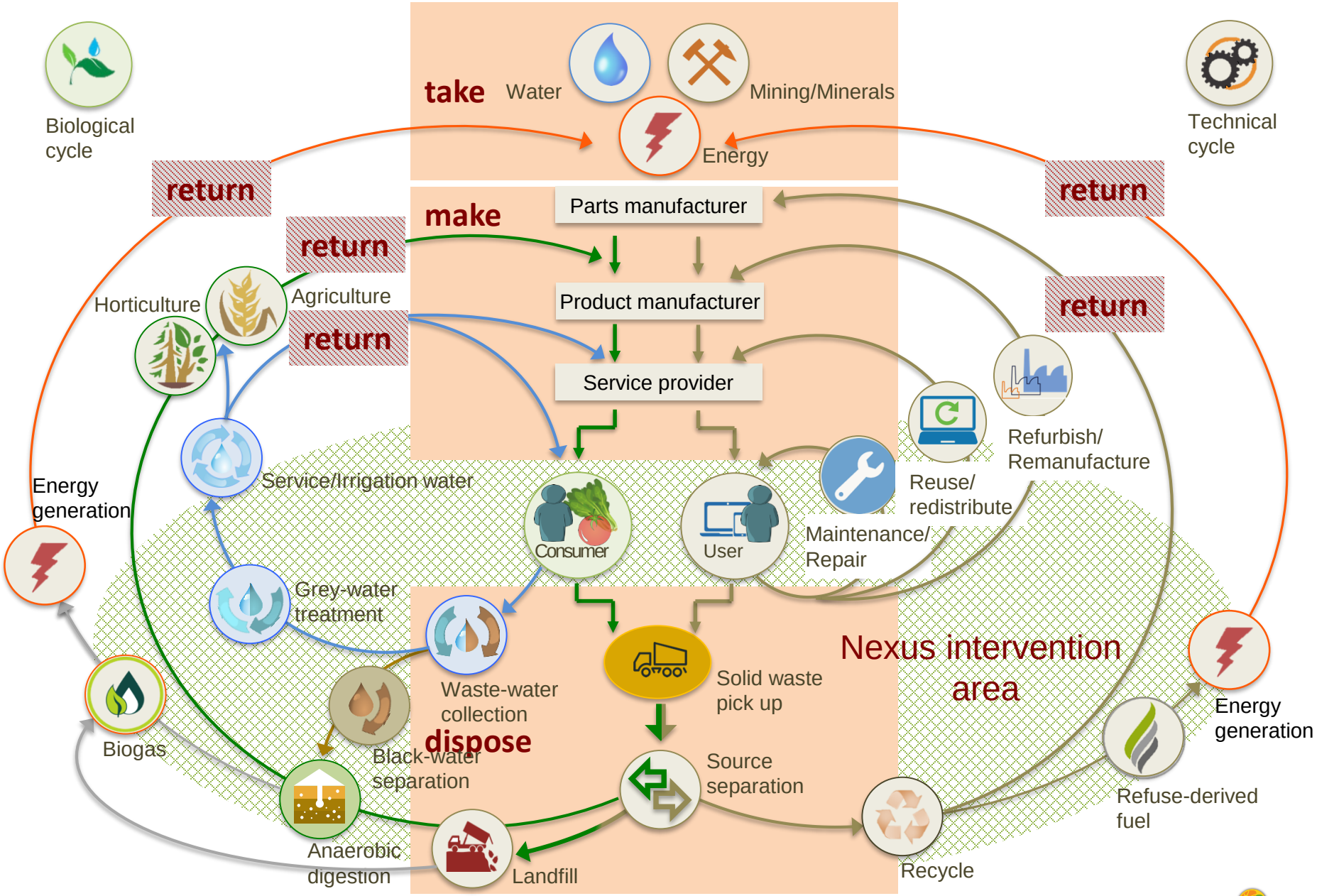


Linear Economy



nexus

Circular Economy with Energy & Mass Flow Cycles

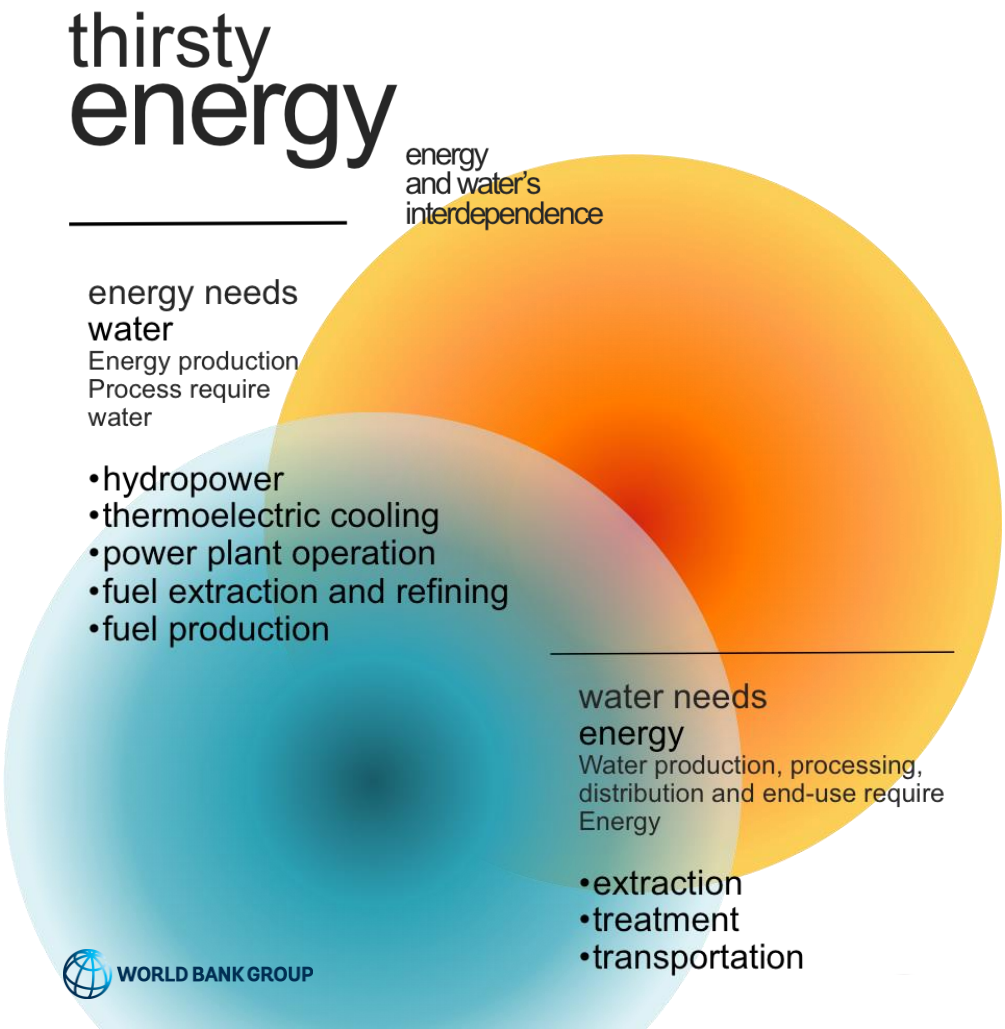


THE URBAN nexus

Water and energy interconnected

- For nearly all types of energy production (coal, geothermal, hydro, oil, gas and nuclear) huge amounts of water are required
- On average **15% of the world's total water withdrawals are used for energy** production;
- **Energy is the dominant cost factor in the provision of water and wastewater** services
- Energy can account for up to **30% of total operating costs** of water and waste water utilities.

Robert C. Brears is the author of Urban Water Security (Wiley)



german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

THE URBAN nexus

Energy & Material Cycle of Solid Waste

- Solid Waste to Energy
- Solid Waste to Water
- Recycling of Solid Waste/Valuables

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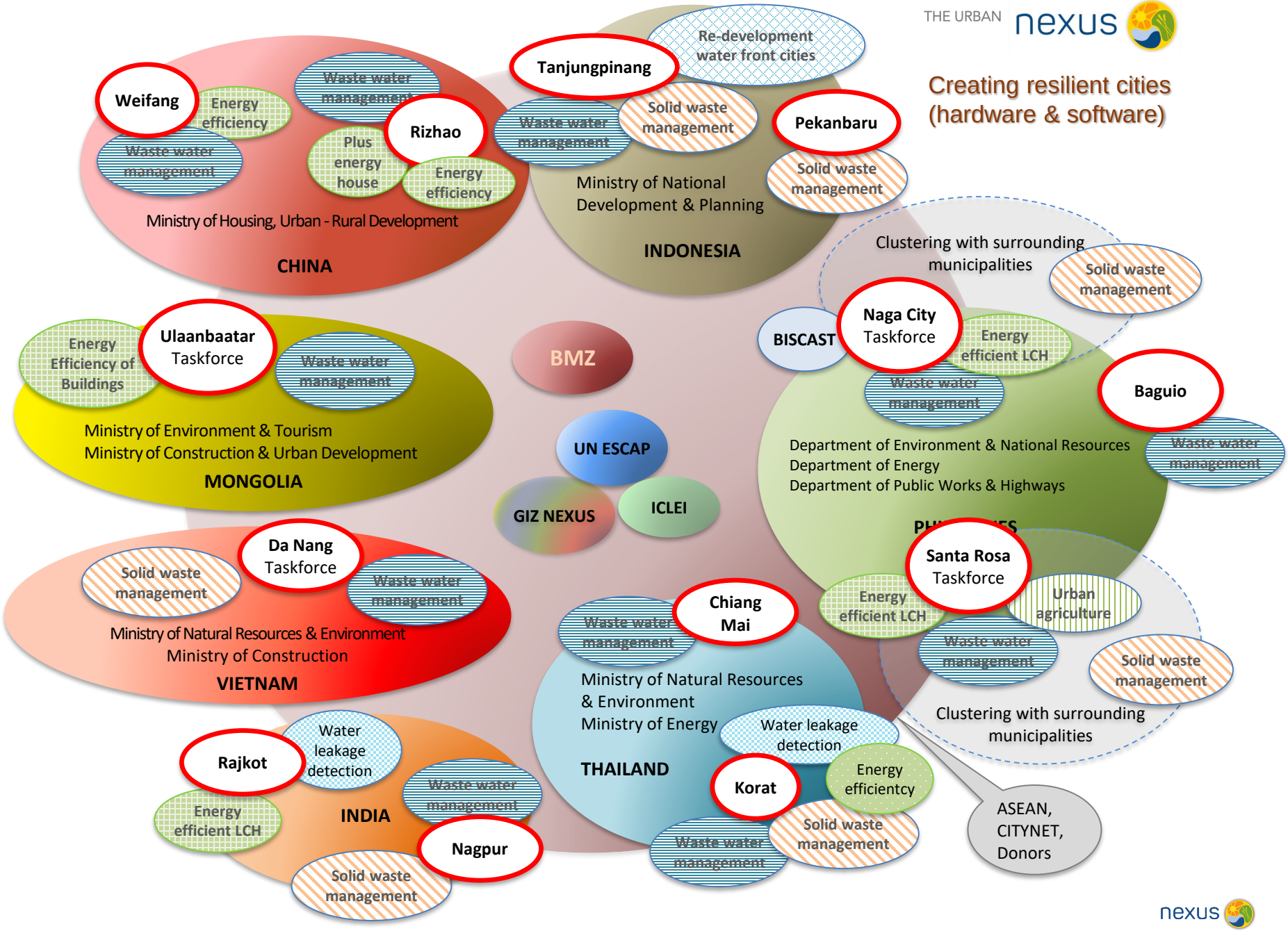
Creating resilient cities (hardware & software)



nexus

THE URBAN nexus Results

- More than **30 practically oriented nexus infrastructure (pilot) projects** elaborated in the Nexus partner cities amounting to an **investment volume of USD 300 million CAPEX** (pre- and feasibility studies also including OPEX).
- Decision makers have been made aware that **waste and waste water are not a burden but an opportunity to create additional income.**
- The introduced technologies reflect decentralized approaches, however, being built up as **modular systems**, they can also **be integrated into existing grid systems**.
- Cross-sectorial composed **Nexus Task Forces** in Nexus Partner Cities accompany pro-actively the elaboration of the infrastructure projects.
- In national-subnational-local dialogue forums questions of mandates, technology solutions and decentralization approaches are discussed and have led to improved mutual understanding in the framework of **vertical integration.**
- **Horizontal integration** promoting inter-communal cooperation in particular with regards to infrastructure projects requiring economies of scale are increasingly emerging in the area of solid waste management.
- **Peer-to-peer learning** has led to a better mutual understanding of shared problems and solutions, however, always requiring a tailor-made approach.

THE URBAN nexus

as action-oriented guiding principle!

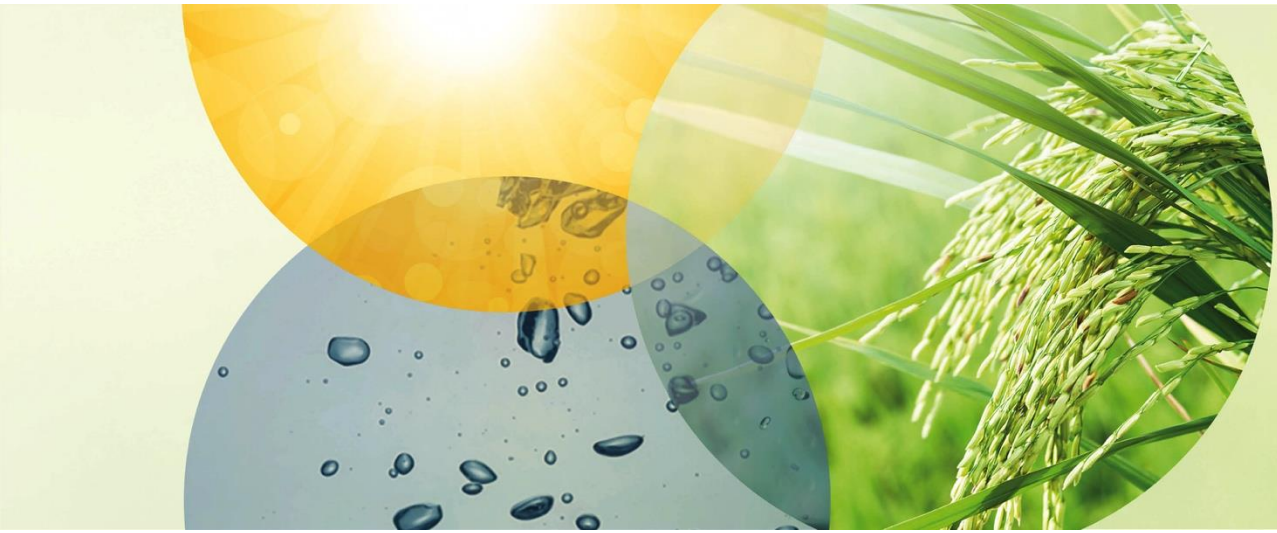
Integrated cross - sectorial system approach within the vision of a circular economy and international agendas

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

7 RENEWABLE ENERGY
6 CLEAN WATER AND SANITATION
11 SUSTAINABLE CITIES AND COMMUNITIES
13 CLIMATE ACTION

HABITAT III
QUITO - OCTOBER 2016
The New Urban Agenda

Graph adapted from German Development Institute / Deutsches Institut für Entwicklungspolitik



"We can not solve problems
with the same level
of thinking
that created them"

Albert Einstein