

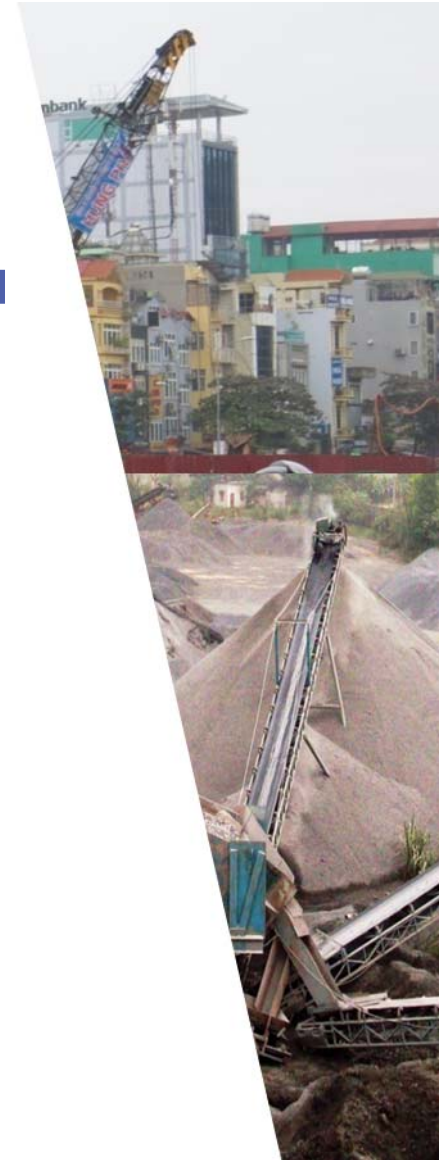
Analyzing Material Flows of Urbanization - a Basis for the Management of Mining Activities in Ha Noi City and its Hinterland

Georg Schiller, Peter Wirth

Dresden NEXUS CONFERENCE 2015

Population Growth and the Increasing Demand
for Environmental Resources

27. March 2015



Project MAREX

Management of Mineral Resource Extraction in Hoa Binh Province – a Contribution to Sustainable Development in Vietnam

Quản lý Khai thác Tài nguyên Khoáng sản tỉnh Hòa
Bình – phục vụ cho phát triển bền vững tại Việt nam





MAREX - Objectives

- To enhance the **knowledge base** about the impacts of mining
- To improve **cleaner production technologies** (mining and recycling)
- To introduce methods of **material flow analysis**
- To establish a **business-policy interface** for the management of mineral resources

Outlook

- Framework
 - SDG
 - Green Economy
- Drivers of construction material demand
 - Population Growth
 - Resource Consumption
- MAREX – modules and products
- MFA – Concept
- Final reflections



Sustainable Development Goals (SDG)



(UN 2014)

Sustainable Development Goals (SDG)

- advancing economic growth
- reducing disparities in living standards and the creation of equal opportunities
- sustainable management of natural resources
- Emphasizing the importance of people in the development process
- strengthening of the regional and local dimension
- implementation of sustainable development into concrete activities

“From ‘silo thinking’ towards an integrated approach”

(side event at Rio +20, 19 Jun 2012)

Green Economy



Source UNEP.org

- United Nations Environment Program (UNEP):
 - economy that results in improved human well-being and social equity, while (...) reducing environmental risks and ecological scarcities
 - ... seeks to unite under single banner the entire suite of economic policies (...) of relevance to sustainable development

Green Economy and Sustainable Development



Sustainable Development Concept
basic principles
three pillars concept



Source www.cleanbiz.asia

Green Economy
embedding the economy
in the society and on the ecology

- *systemic approach more emphasized*
- *emphasize application*

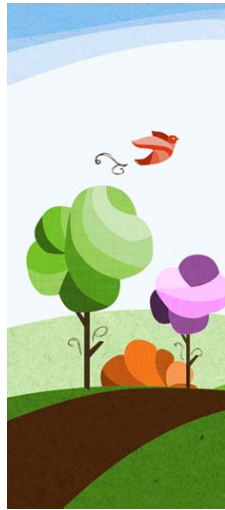
- *social instabilities*
- *ecological limits* → *collapse of the whole system*



Source UNEP.org

(UNEP 2012, Hoff 2011, Reddy et al 2015)

Viet Nam
National
Green
Growth Strategy



many links in terms of
resource conservation,
recycling, planning issues ...

Viewpoints

- contribution to climate change strategy
- efficient use of natural capital
- using modern technologies
- ...every level (government, ministries, localities, enterprises, social organizations)

Objectives....

Strategy tasks...

Solutions

Drivers for construction materials demand



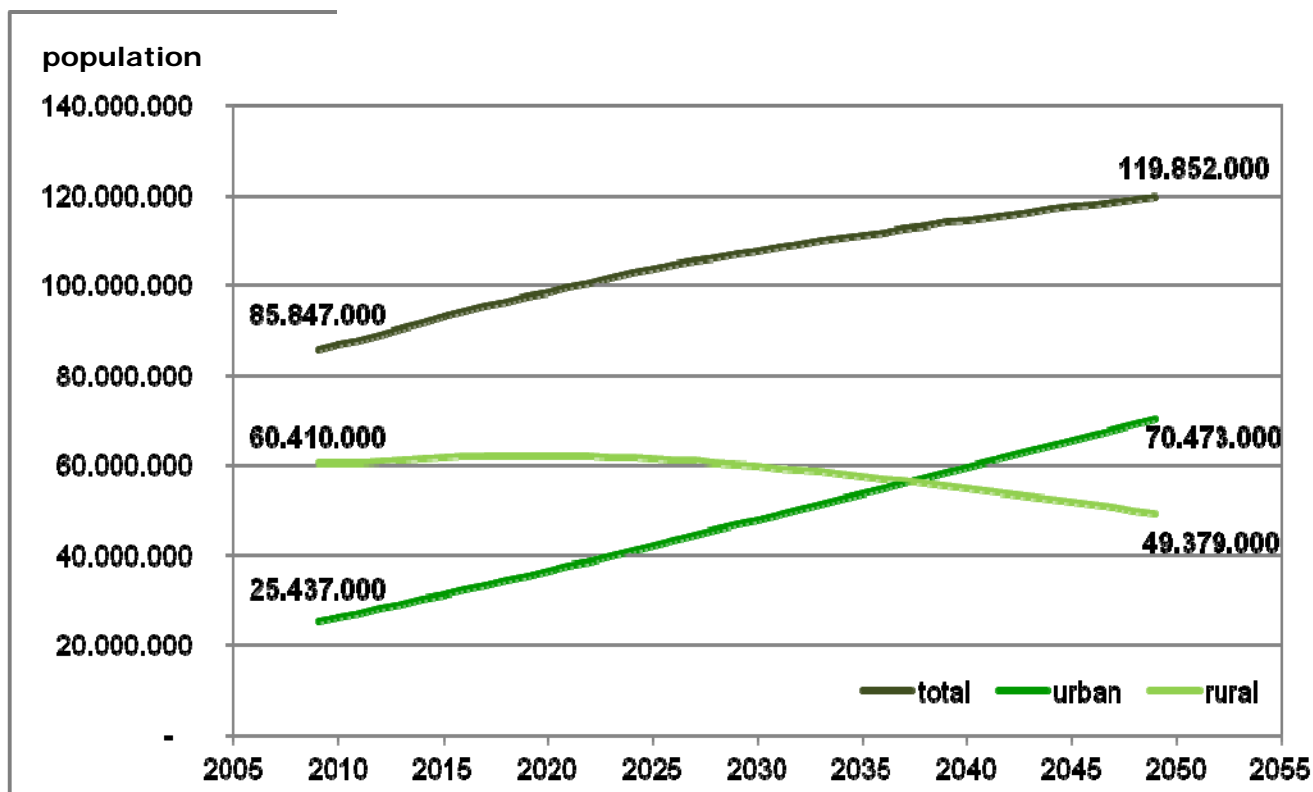
- population development
- development of prosperity / change of live style
- demand for buildings and infrastructures

Population Development

Vietnam
2009-2049

+ 40 % in 40 Years (total) (+ 1% / year)

+ 177 % (urban areas) (+ 4,4% /year)



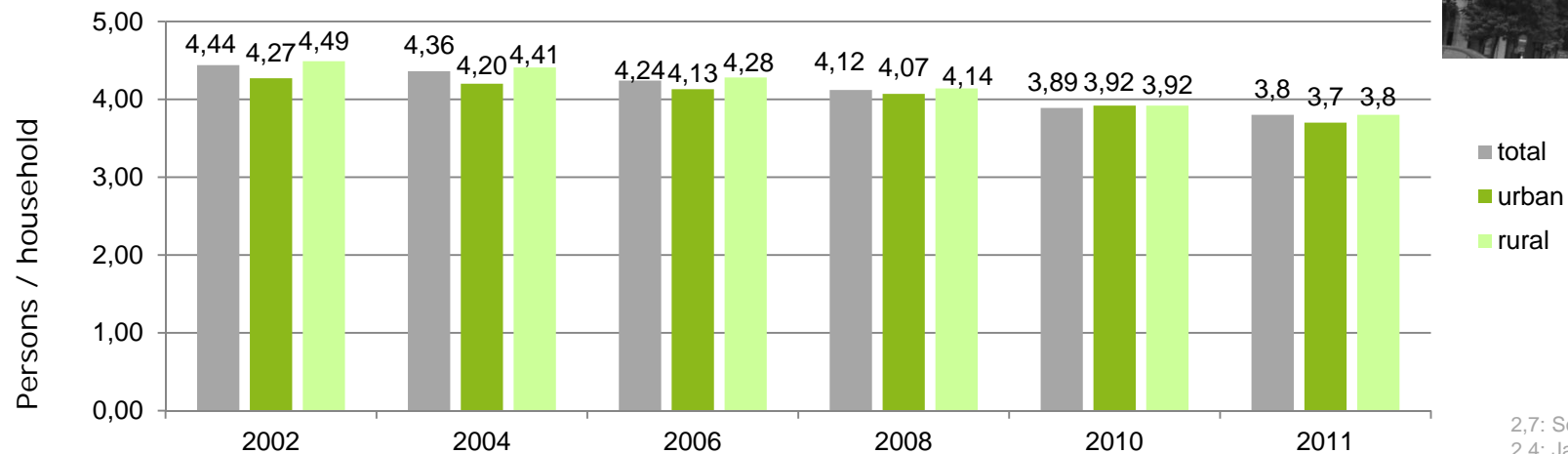
Source: Population projection for Vietnam 2009-2049, Part 2: Projection result tables, S. 33, variant high



Development of prosperity/change of lifestyle

Decreasing household size

- > more floorespace per person
- > demand for buildings and infrastructures



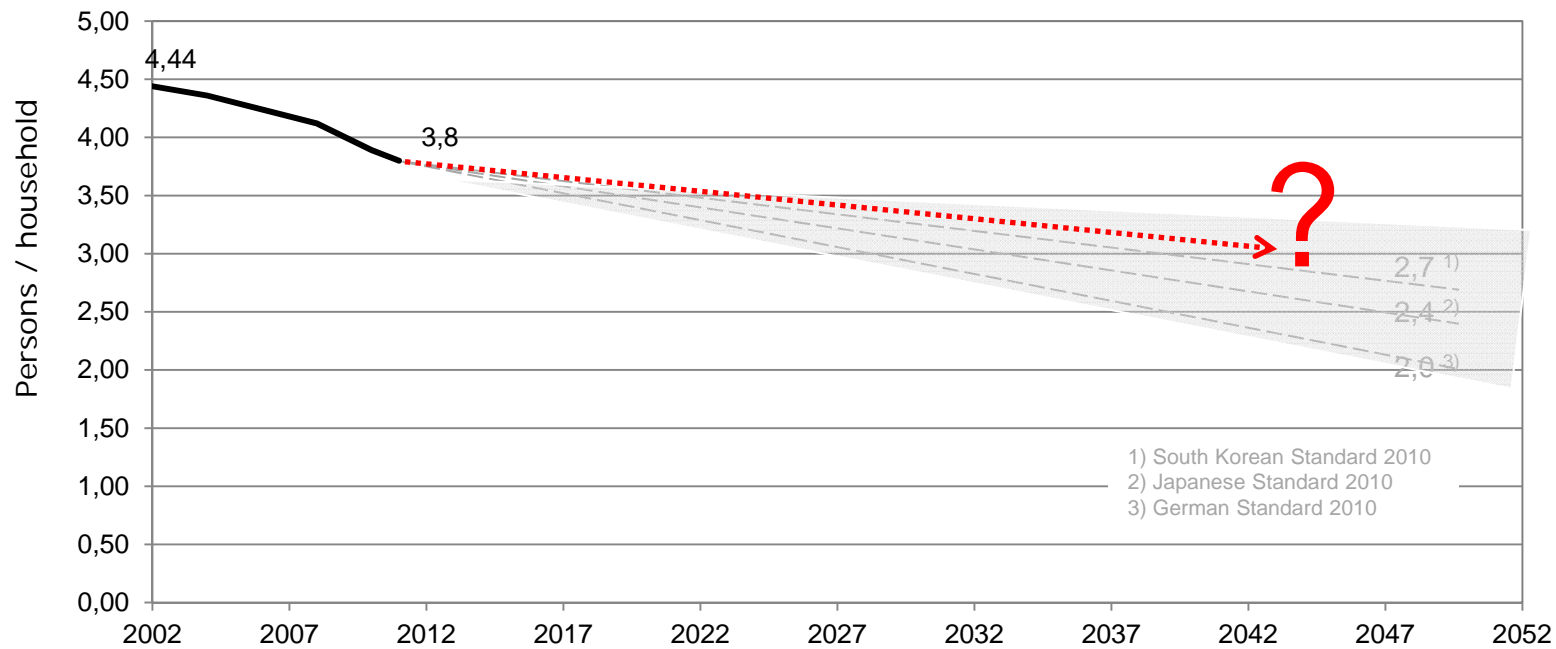
Sources: Vietnam household living standards survey 2010, the 1/4/2011 population change and family planning survey



2,7: South Korea 2010
2,4: Japan 2010
2,0: Germany 2010

Future development?

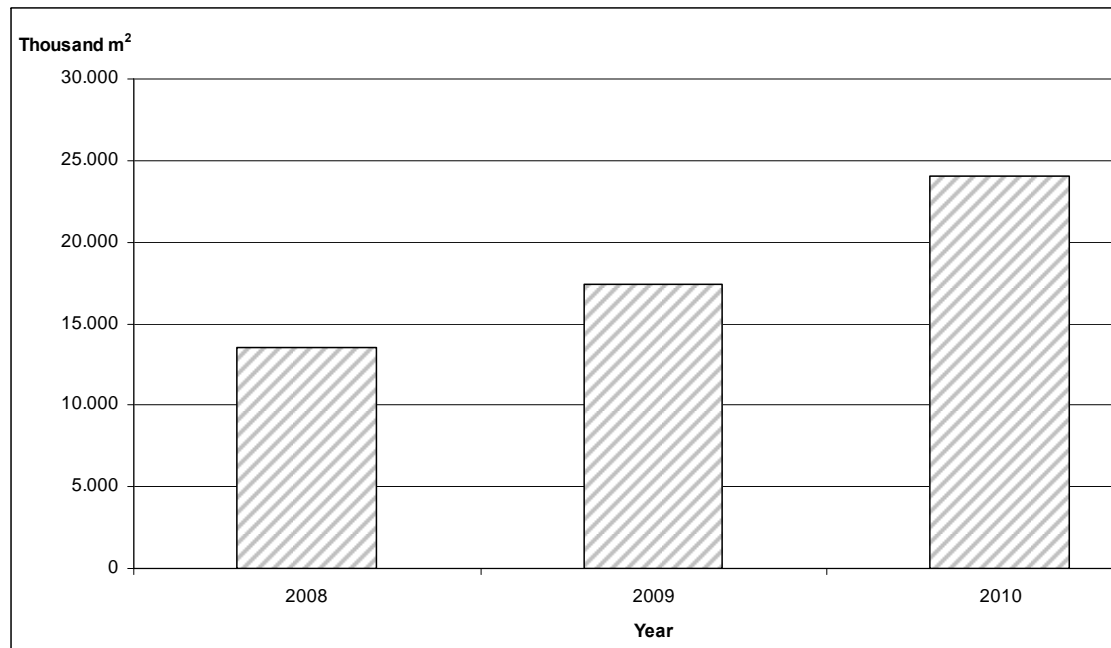
Increasing prosperity is related to increasing consumption of floor space in general



Source: Source: General Statistics Office

Building boom

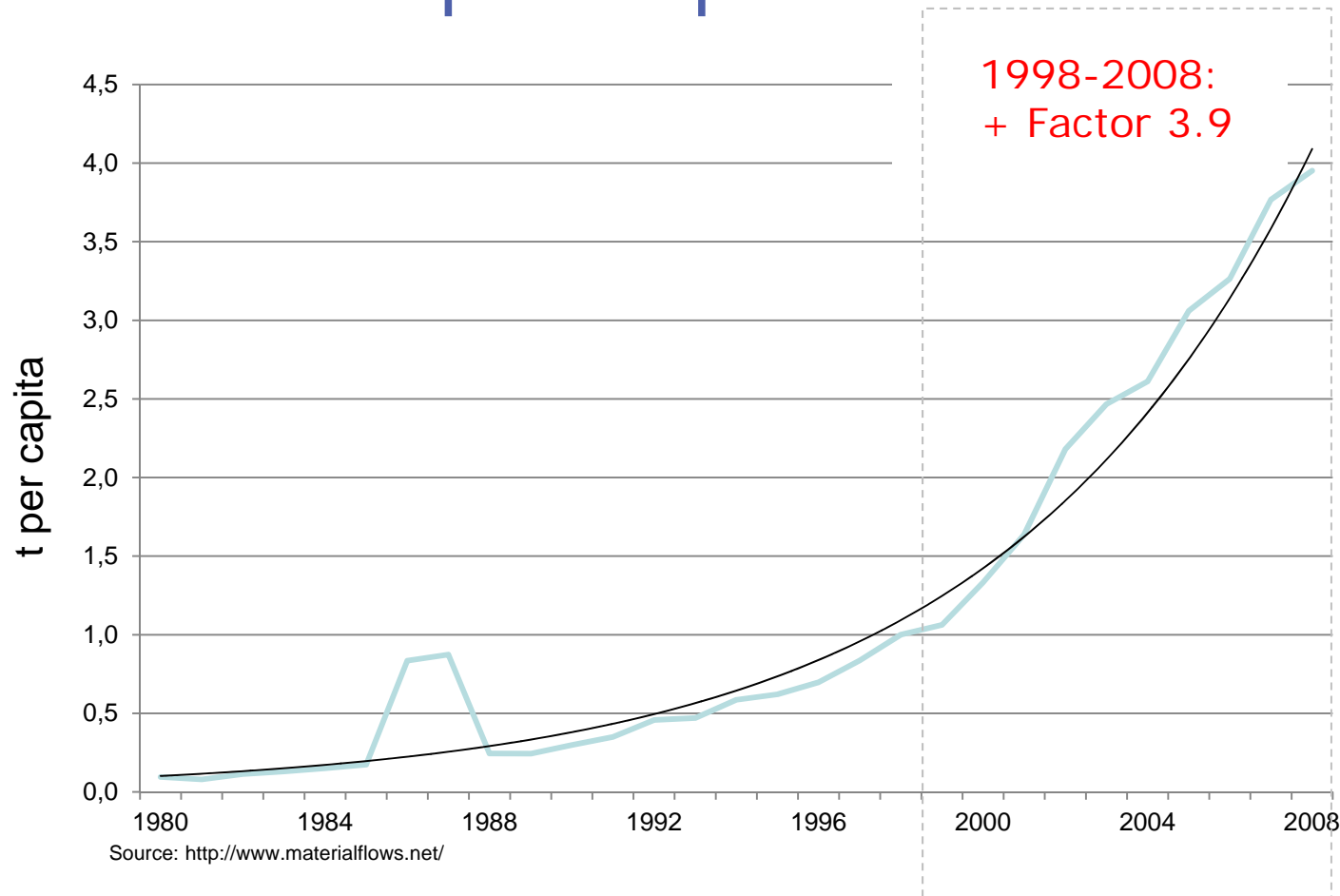
Completed residential floor area
in the Red River Delta region



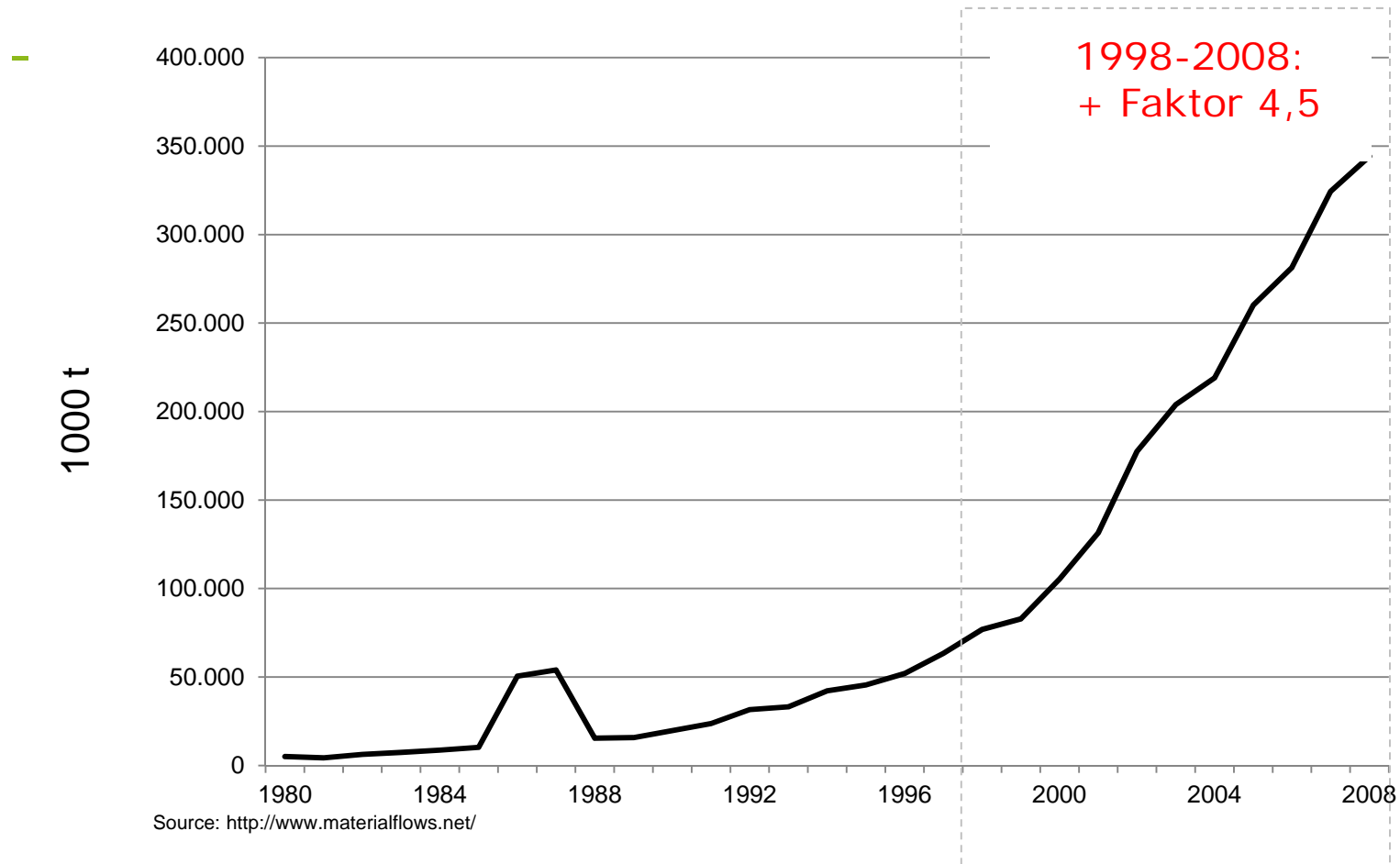
Source: Source: General Statistics Office



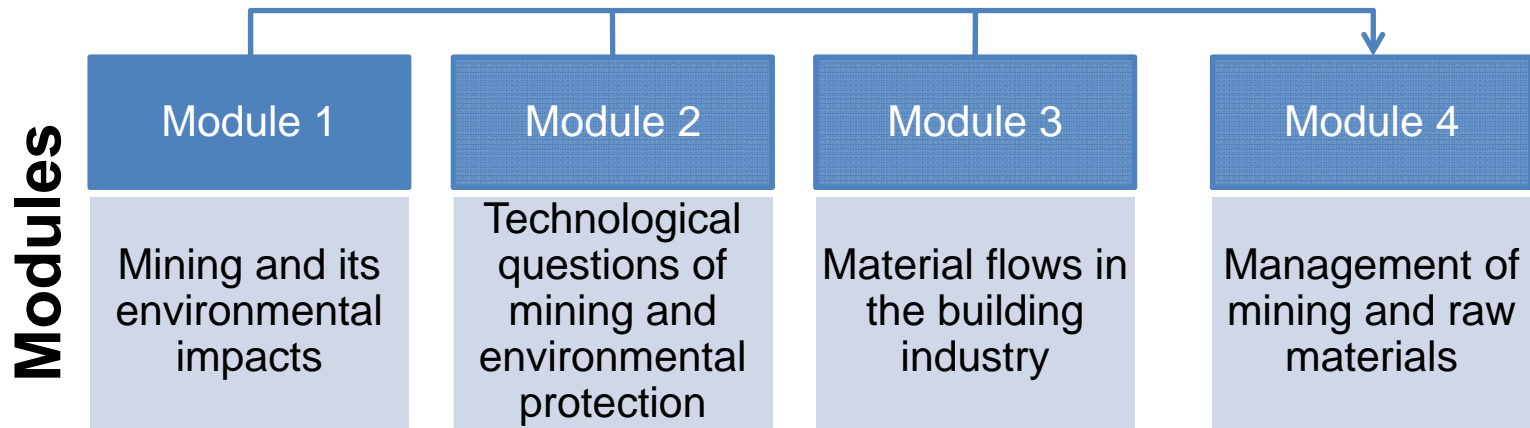
Consumption of construction minerals per capita



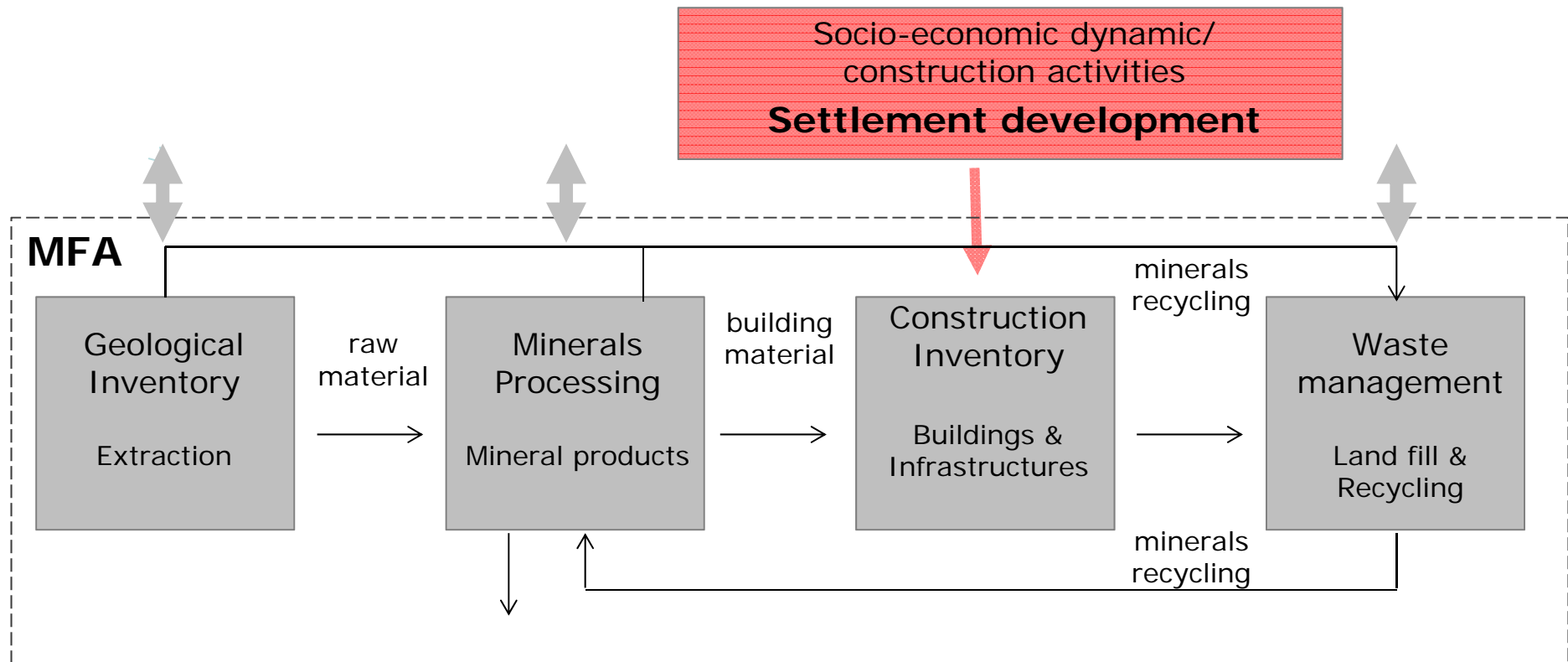
Demand for construction minerals in Vietnam in total



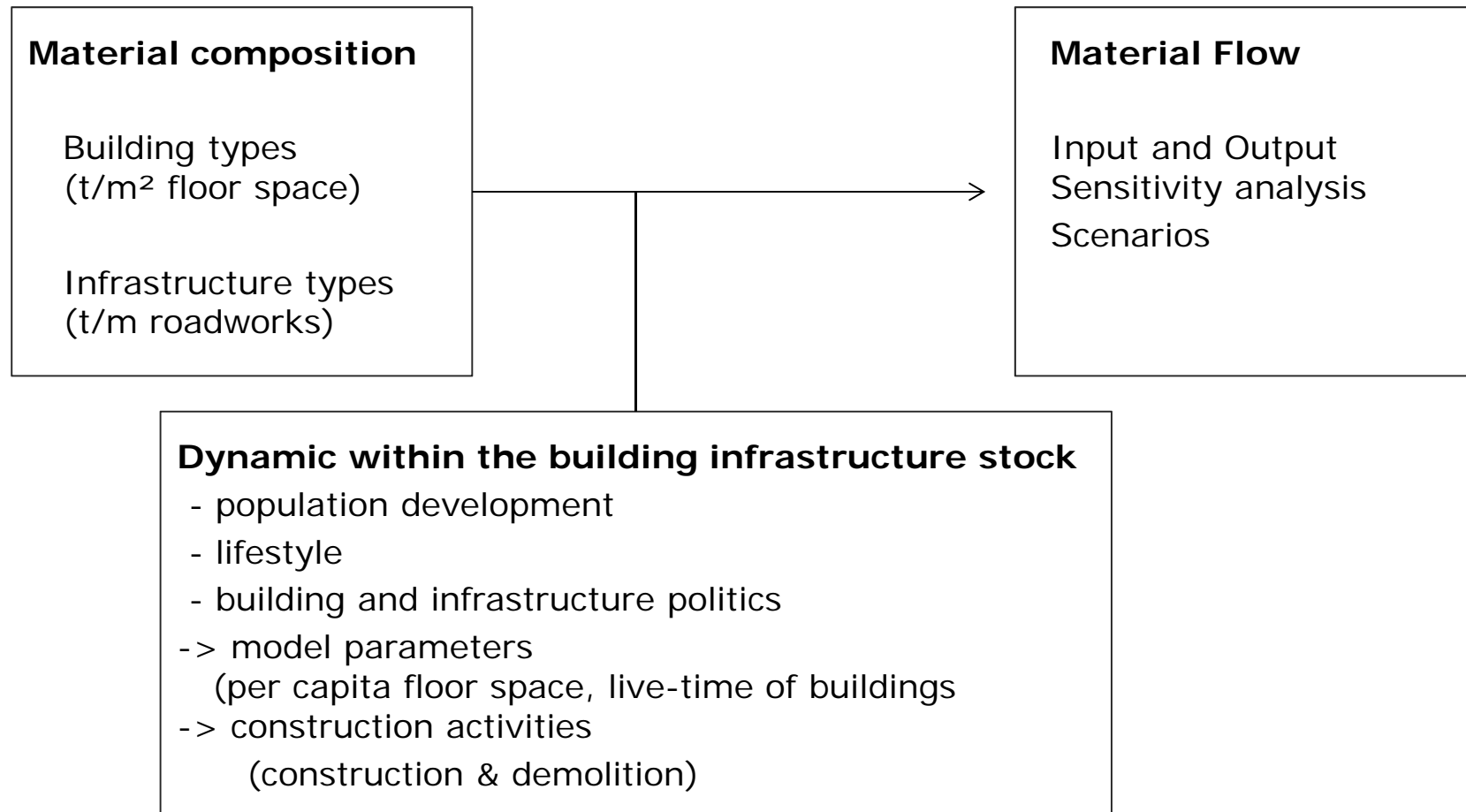
MAREX - Modules



MFA Concept

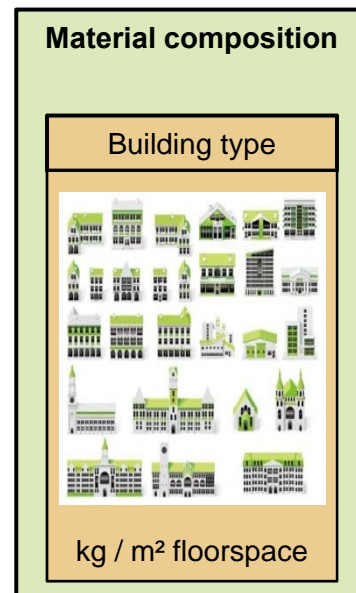
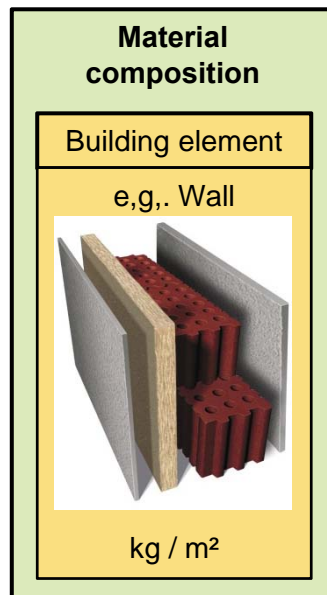


MFA-bottom-up-approach - the principle



Material composition parameters

- examples -



Data bank buildings in Germany

Bestands-Gebäudetyp (Wohnen)	Epoche	Gesamt	Mineralisch	darin		Holz	da
				Betone	Ziegel		
EFH-1	bis 1918	334,09	313,21	73,42	124,83	16	
EFH-2	1919 bis 1948	320,34	300,87	82,8	116,06	12	
EFH-3	1949 bis 1968	305,81	290,86	141,68	4,38	7	
EFH-4	1969 bis 1990	369,18	356,3	196,78	9,26	5	
MFH-1	bis 1918	201,95	189,28	48,32	72,19	8	
MFH-2	1919 bis 1948	187,63	176,05	44,6	67,66	8	
MFH-3	1949 bis 1968	176,33	172,26	90,39	7,52	0	
MFH-4	1969 bis 1990	211,96	206,27	130,1	6,21	0	

Neubau-Gebäudetyp (Wohnen)	Gesamt	Mineralisch	darin		Holz	M	davon
			Betone*	Ziegel			
EZFH	290,4	271	168,7	19,03	12		
MFH	214,9	208,5	123,4	13,89	1,7		

Gewerbe - Gebäudetypen	Baustoff	
	Beton	Ziegel
	Mg/Geb.	Mg/Geb.
Anstaltsgebäude	954	954
Büro- und Verwaltungsgebäude	777	489
Landwirtschaftliche Betriebsgebäude	41	42
Fabrik- und Werkstättengebäude	474	196
Handels- und Lagergebäude	358	203
Hotels und Gaststätten	214	377

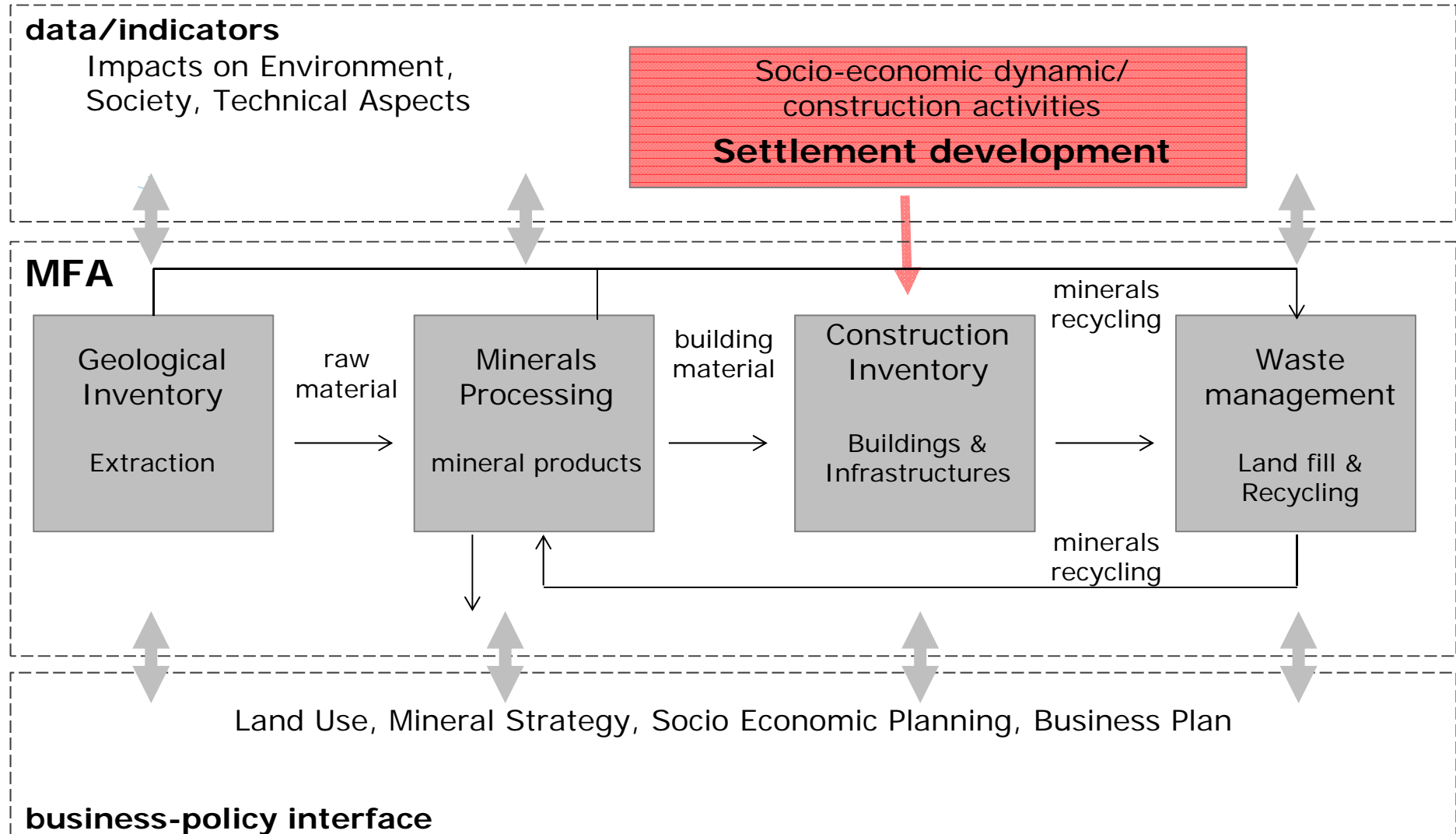
Material composition parameters - examples -

Chinese building types (Hu et al. 2010)

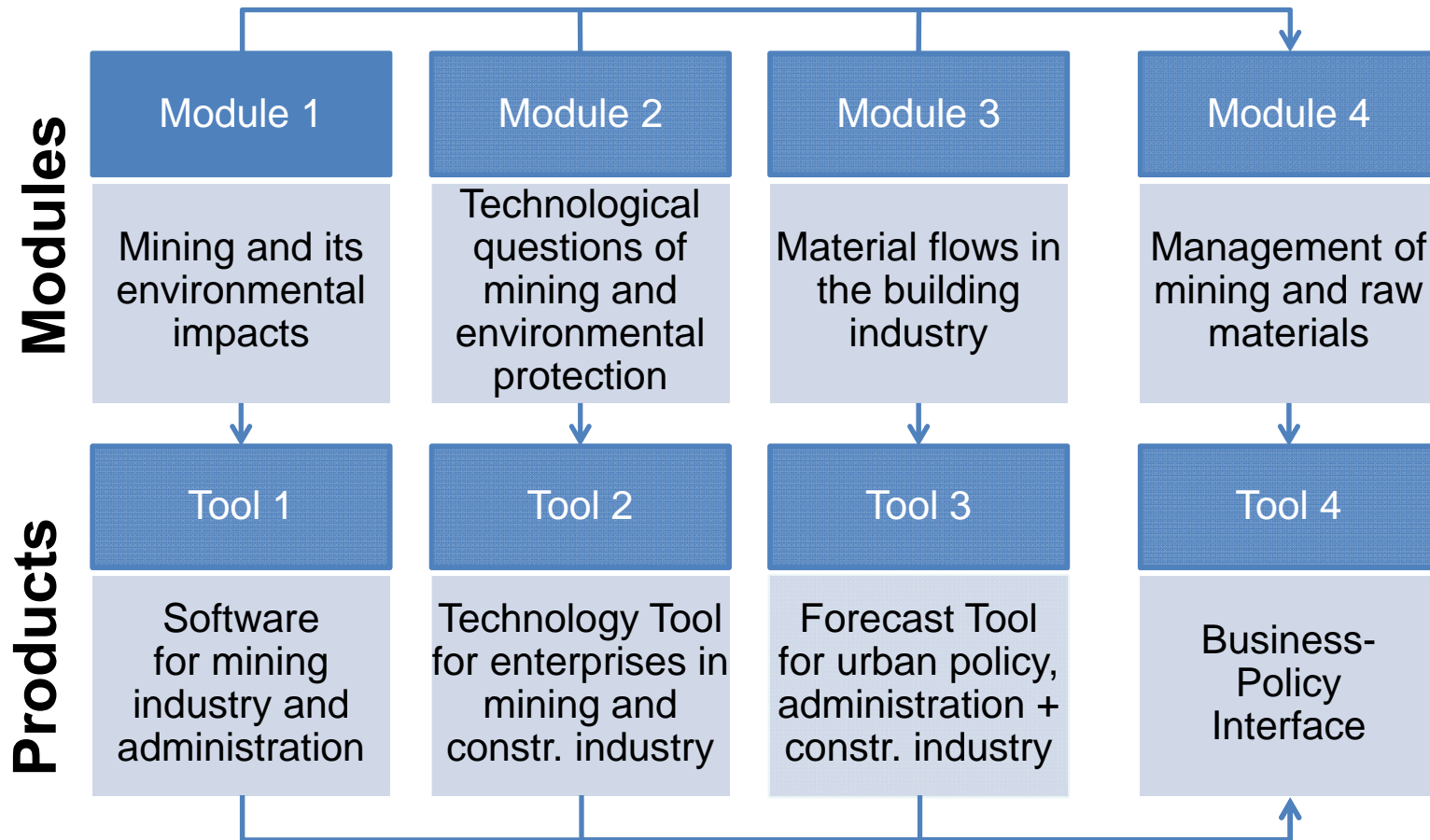
Material composition of three main structures of residential building in Beijing (kg/m²)

Structure	Cement	Steel	Sand	Gravel	Wood	Brick
Brick-concrete	148.1	23.4	573.5	657.8	15.5	364.3
Concrete frame	212.3	46.6l	452.9	838.3	14.9	42.8
Shearing-force	285.7	97.1	579.0	1204.8	13.0	14.0

MFA Concept



MAREX – expected outcome

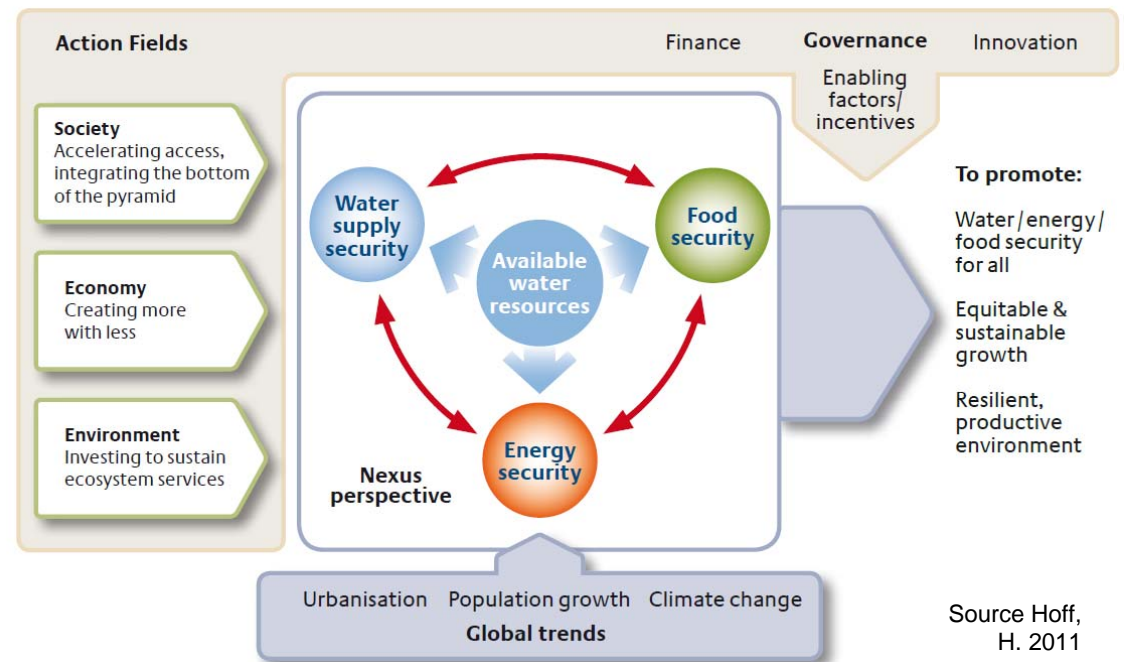


Addressed SDG



NEXUS Dimensions

- Soil , Water, Waste
- Urban, Rural
- Cross sectoral
- Cross government levels



Role of MFA within the implementation – oriented process

- Tool to pinpoint action fields and needs for action
- Vehicle to set off / promote discussion



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