

Designing for stakeholder values in port development in Africa



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The Netherlands and Ghana

S.P.



AFRICA

SUSTAINABLE PORTS IN AFRICA

Approach

- Place-based
- Stakeholder-inclusive
- Ecosystem-based
- Design-oriented
- Bottom-up
- Aiming to meet societal, economic & management challenges



Transdisciplinary, game structuring approach

**Applied in:
Texas, USA
South Africa,
the Netherlands**

Context

4 Feb	• Research team travel to Ghana	DIMI Ghana
5 Feb	• Field trip along the coast to	Observation,
6 Feb	• Mini-symposium with research	Knowledge integration
7 Feb	• Data acquisition and interviews	Developing system understanding
8 Feb	• Data acquisition, interviews preparation	Stakeholder-inclusive, value-based design
9 Feb	• Multi-stakeholder Workshop	
10 Feb	• Academic follow-up meeting	Feedback, Integration



6-Step Workshop

1. Getting acquainted **Who are we?**
2. Developing the system story; local context, history, past, present and future of Tema **What do we care**
3. Developing the system story; research on Sustainable Ports in Africa, Tema **Who cares?**
4. Identifying key stakeholders **Visioning**
5. Developing visions **Valuing**
6. Voting on visions from the point of view of stakeholders

#2 – Developing the system story: local stakeholders on past, present, future Tema

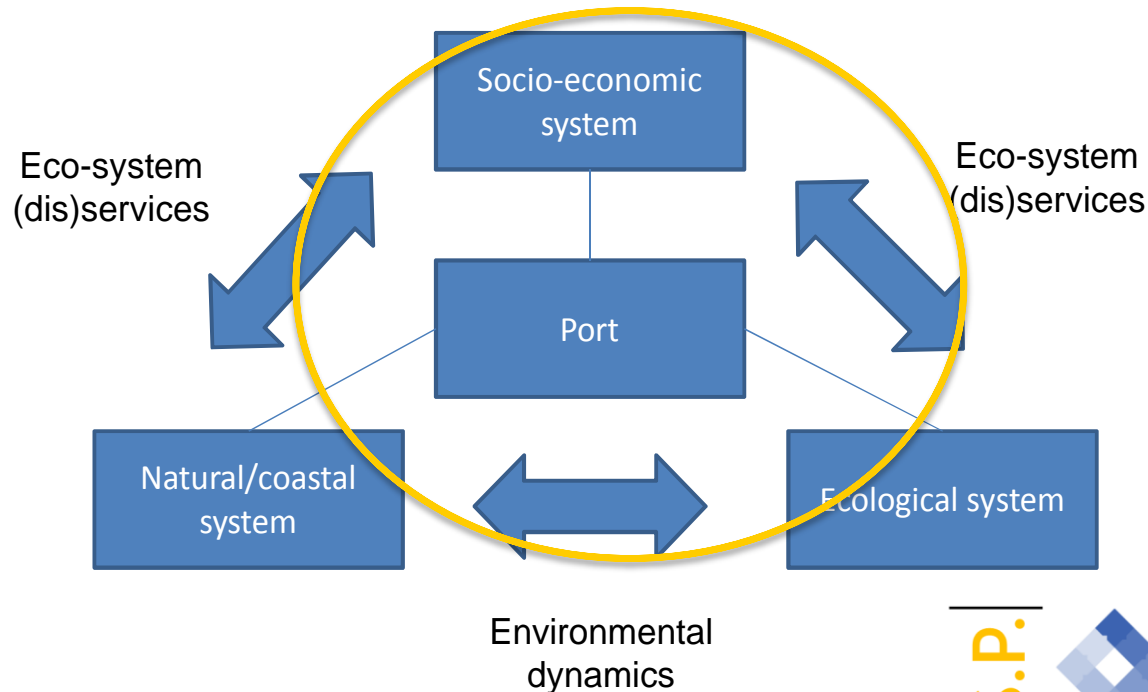


#2 – Developing the system story: local stakeholders on past, present, future Tema



#3 Developing the system story: researchers on Tema and its Port

Interaction
people, planet and profit



#3 Developing the system story: Researchers on Tema and its Port

- Tema Coastal System
 - Kwasi Appeaning-Addo, Wiebe de Boer
- Coastal Ecosystem Response to Change
 - Edem Mahu, Arno Kangeri
- Values Associated with Ecosystem Services
 - Mark Koetse, Barnabas Amisigo

#4: Who cares?

Identifying key stakeholders

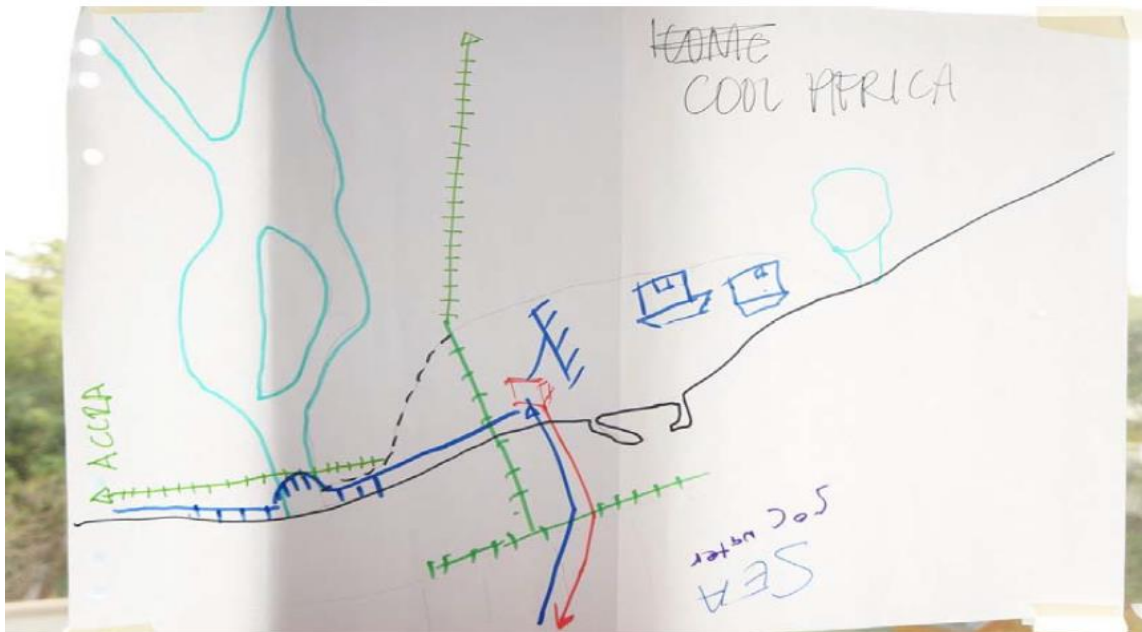


1. Civil society organizations
2. Private Sector
3. International
4. Education and Research
5. Ministry of Transport & Agencies
6. Local and Traditional
7. Ministries
8. Environmental Regulators
9. Politicians

#5 – Developing future visions

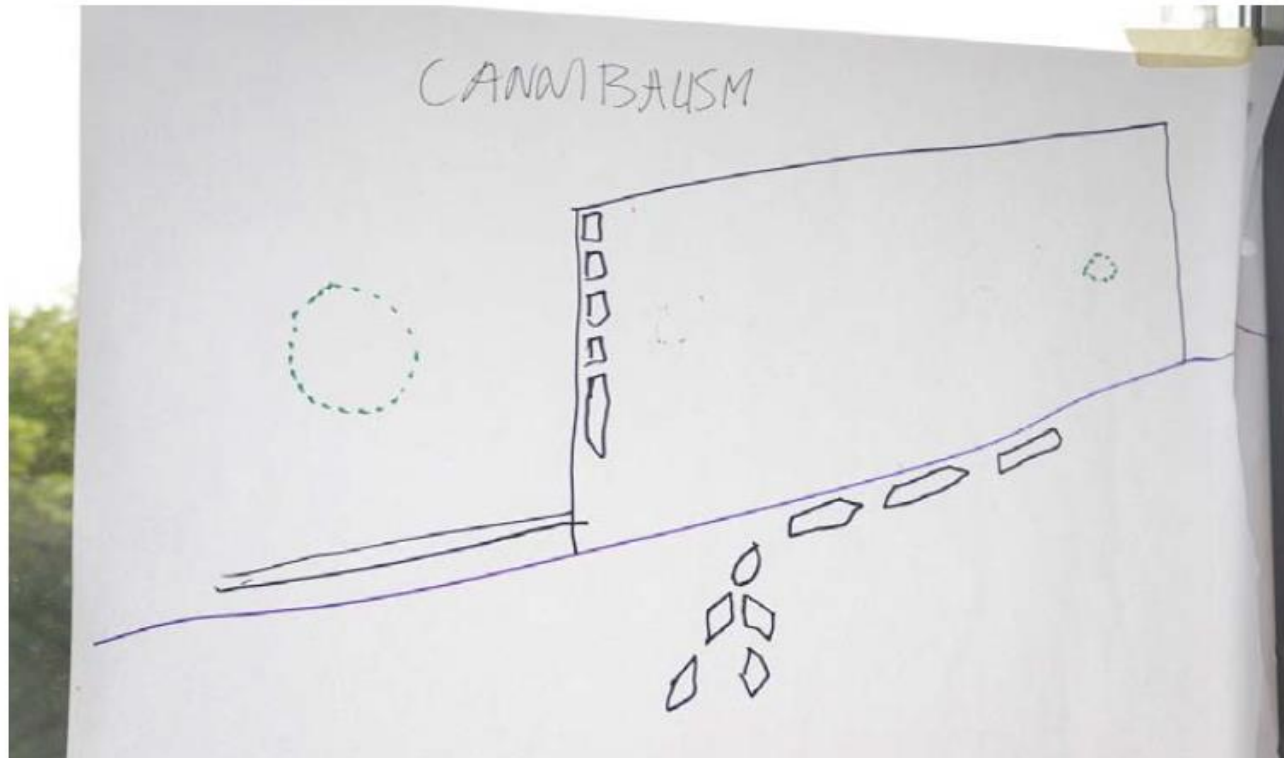
1a. Cool Africa

- ❖ Economic interests and ecology are in balance although there is limited land, growing population
- ❖ Improved transportation including an inland port
- ❖ Estuaries are designated as a critical habitat e.g. sakumono, Chemu lagoons
- ❖ GPHA incorporates the lagoon systems into their development, in an ecologically sensitive way
- ❖ Meridian Rock will also act as a artefact of tourist interest
- ❖ Tema wastewater treatment sewage system is broken now, but then it will be working
- ❖ Tema administration needs to be fixed
- ❖ Port development – 10 million euros
- ❖ Offshore docks will be linked by rail systems to the mainland and hinterland
- ❖ 5°C water from deep sea will be used to cool facilities and improve export potential



1b. Cannibalism

- ❖ Chemu and Sakumono lagoons have almost vanished
- ❖ No humans are living in Tema or near the port
- ❖ Containers abound
- ❖ There is cannibalism, as food is short and only port development counts



2a. State of the Art

- ❖ Gateway terminal with low waiting time for goods by maritime transport
- ❖ Terminals outside the port
- ❖ Little travel time for port employees
- ❖ Direct link to the national road network, good roads, dedicated lane for port traffic
- ❖ Good rail network
- ❖ Cranes that can work on both road and rail, rather than one or the other
- ❖ Cross modal transport system
- ❖ Link to Volta via canal
- ❖ Fully automated cranes and gates, CCTV cameras and systems to regulate access where you want to go
- ❖ Port has own tram system
- ❖ All waste well managed
- ❖ Residential areas close to the port with affordable housing (for port workers)
- ❖ Hovercraft to attract tourists, local people as tourists
- ❖ Port not only for cargo, also for passengers and local people
- ❖ Experienced as a State of the Art port

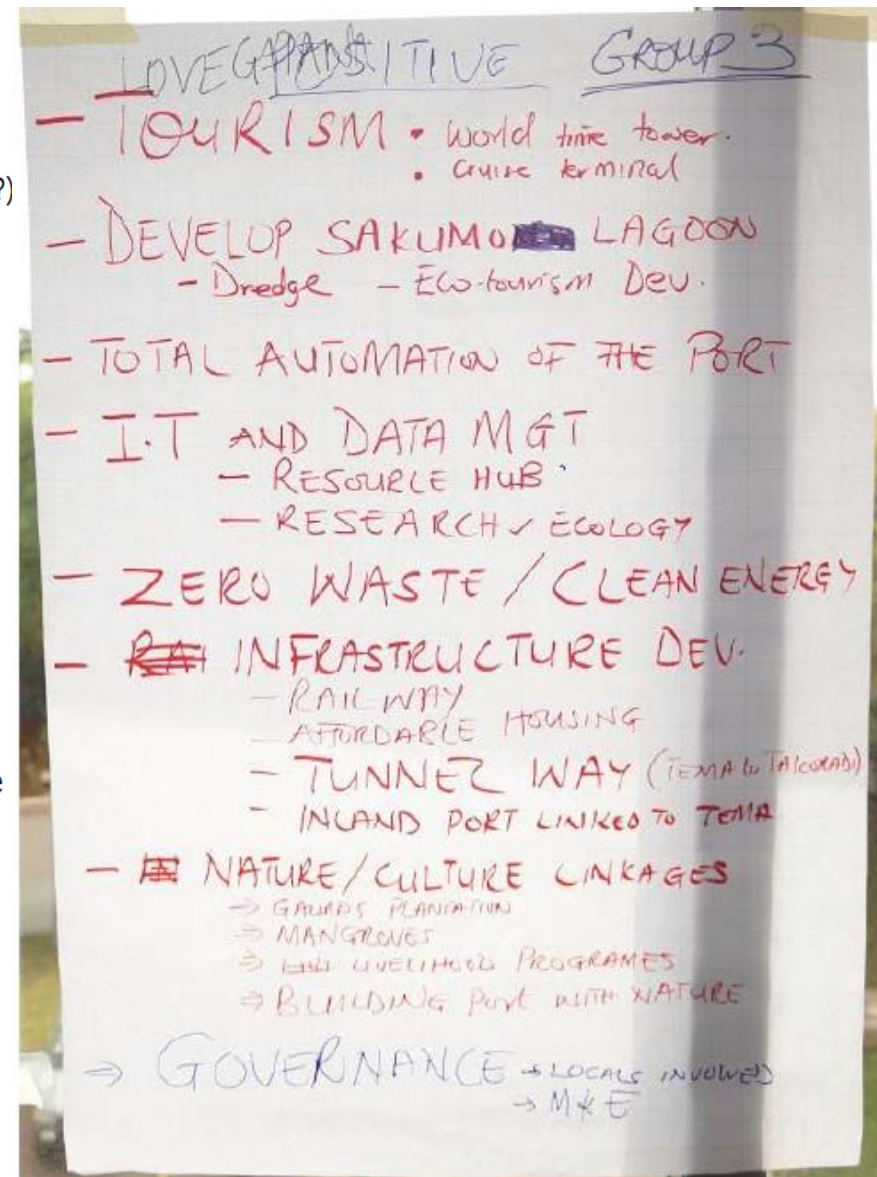
2b. Madness

- ❖ Polluted environment
- ❖ Bad drainage and visible sewerage
- ❖ Congested traffic
- ❖ State interference
- ❖ Duplication of functions
- ❖ Slum development
- ❖ Human traffic into the port
- ❖ More security offices at the port – there are too many now.
- ❖ Depicted on the upper part of the picture above



3a. Love Ghana

- ❖ People need to identify with the port
- ❖ Tourism:
 - World time tower (Meridian line) with museum, tourism office, cultural(?)
 - Cruise terminal for cruises from Tema to the equator
- ❖ Tram system in the port
- ❖ Dredge Sakumono lagoon – eco-tourism development
- ❖ Total automation of the port
- ❖ IT & data center
 - Resource Hub
 - Research (ecology)
- ❖ Zero waste and clean energy
- ❖ Infrastructure:
 - Railway Tema-Takoradi, also for transport of goods
 - Tunnel way, also towards Ada
 - Affordable housing
 - Inland ports linked to Tema
- ❖ Nature-culture linkages
 - Tema was formally Toma – the calabash god
 - Replant the calabash to bring economic value to the surrounding people
 - Mangroves
 - Livelihood
 - Port with nature – leave space for ecological developments
- ❖ Governance:
 - Involve locals
 - They can assist in monitoring and evaluation
- ❖ Depicted below



3b. Hate Ghana

- ❖ Business as usual
- ❖ Loss of revenues/economic opportunities
- ❖ Development agenda driven from elsewhere; (Strong) Investor influence
- ❖ Only containers in the port, no room for anything else
- ❖ Congestion of port
- ❖ Slums- more poverty
- ❖ Increased pollution: river, marine, terrestrial
- ❖ Loss of biodiversity
- ❖ Loss of Sakumono lagoon in the next 10 years
- ❖ Flooding and coastal erosion
- ❖ Depicted below

- HATE GHANA NEGATIVE (GIRP3)
- ⊗ LOSS OF REVENUE & ECONOMIC OPPORTUNITIES
 - ⊗ Investor influence/adverse impact on Socio-cultural values
 - ⊗ Congestion at the Port
 - ⊗ SLUMS - More Poverty
 - ⊗ Increased Pollution
 - ⊗ Loss of Biodiversity / Loss of stable ecosystem
 - ⊗ Loss of Sakumono Lagoon
 - ⊗ Flooding and Coastal erosion

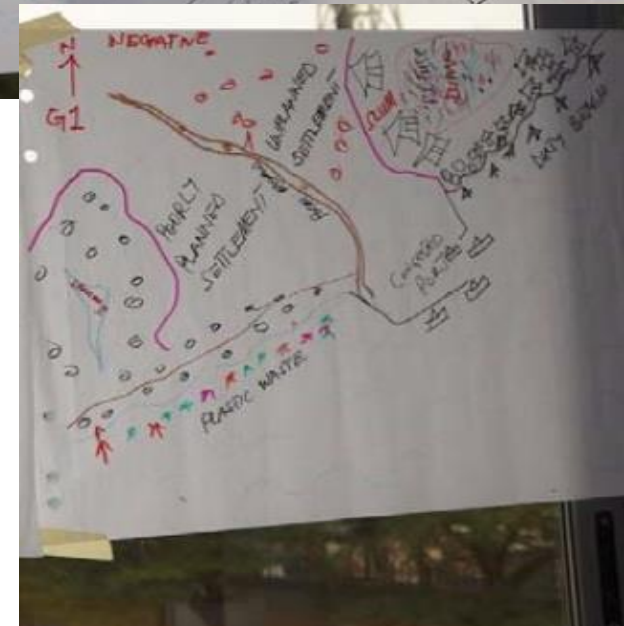
4a. Floating Port

- ❖ Offshore port connecting to Volta Lake and Akasumbo, so that ships don't have to come to shore
- ❖ Underwater road network + railway
- ❖ View of sea from underwater road tunnel, aquatourism as ecotourism
- ❖ Link to Volta river
- ❖ Sufficient inflow to Sakumono lagoon and restoration
- ❖ Chemu lagoon restored
- ❖ Enough fish and vegetation in the lagoons
- ❖ Well planned settlement
- ❖ Well planned roads
- ❖ Green energy – windmill, productivity high, off the national grid
- ❖ Beach nourishment to create beach at Tema with eco-tourism
- ❖ Relocatable offshore floating system

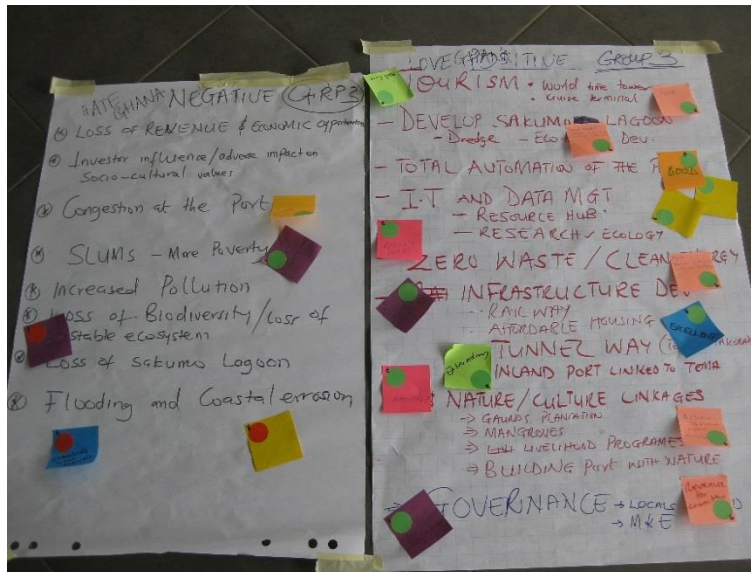
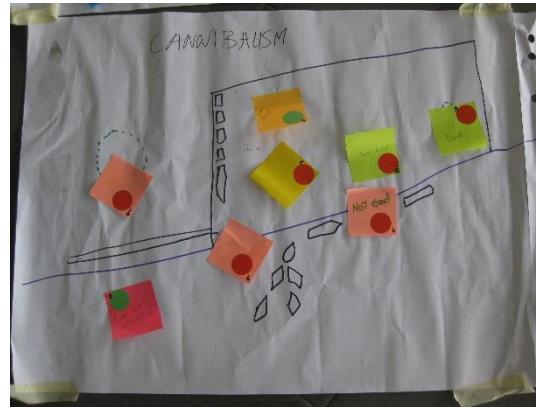
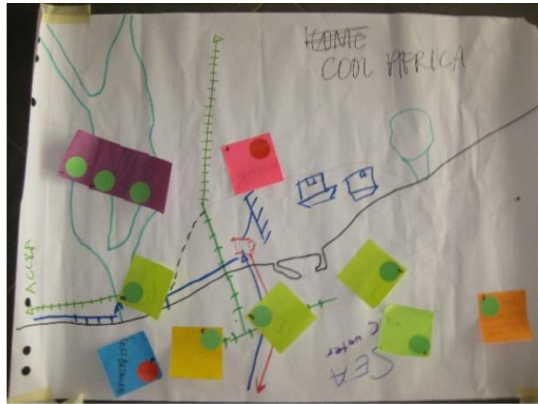


4b. Congested port

- ❖ Congested port, no free flow of cargo
- ❖ No railway/no road improvements
- ❖ Siltation of Sakumono lagoon – it is lost
- ❖ Increased slums and settlement in Chemu
- ❖ Waste (plastic) along the shore
- ❖ Refuse associated with disease
- ❖ Increase in traffic and even more congestion associated with the port



#6 – Voting on the visions



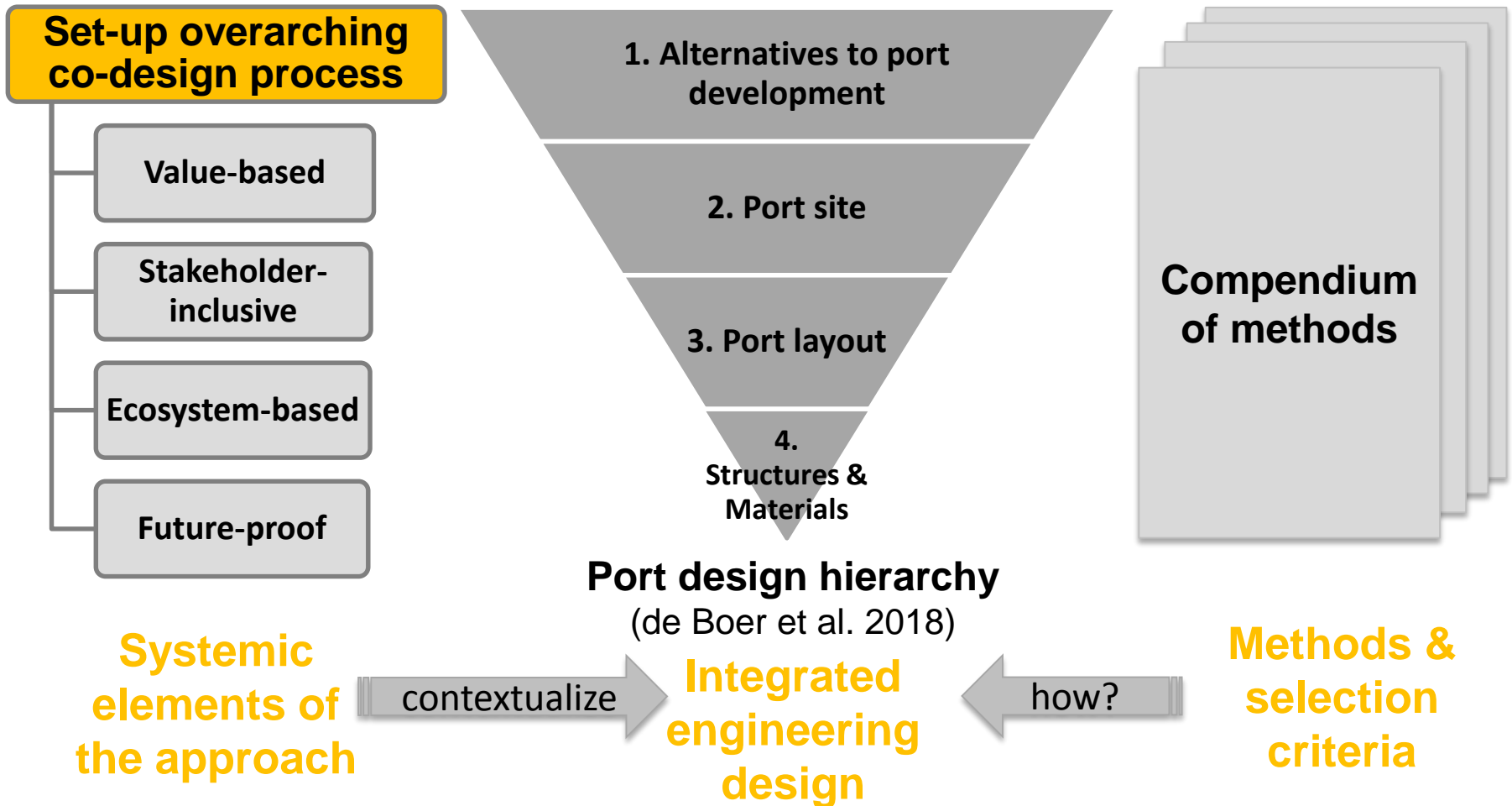
Analysis and interpretation of workshop results

T_{-1}	Historic development
T_0	Existing port (status quo)
T_1	Expansion (standard design)
T_1^+	Incremental added value (green port)
T_1^{++}	Out of the box (green port ++)

Analysis and interpretation of workshop results

- Wide range of envisioned futures
 - with complex inter-sectoral relations
 - reveal understanding of local impacts, global benefits
- 6-step transdisciplinary, game structuring approach was effective in Ghana
 - participants stayed all day and into the evening
 - demonstrated stakeholder-inclusive approach of project
 - provides a basis for further exploration of stakeholder values, and the integrated design framework

Sustainable Ports Framework



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S.P.AFRICA
SUSTAINABLE PORTS IN AFRICA

CREATING A
BLUEPRINT FOR
SUSTAINABLE PORTS

ABOUT THE PROJECT

The project incorporates an integrated approach to port design that is stakeholder-inclusive and encompasses engineering, ecological, economic and governance aspects. A bottom-up approach is employed, with research in all four disciplines directed at relevant and practical cases in Africa.

MAIN AIMS

SUSTAINABLE BUILD

Maintaining the marine ecology in and around a port is of the utmost importance; this contributes to biodiversity, provides ecosystem services, and facilitates port development.

BENEFITTING THE COMMUNITY

The communities around the port participate in creating a port blueprint; including this local knowledge ensures that they derive sustainable benefits from port development.

EXPERT INPUT

Applied research and knowledge institutes, practitioners and potential users collaborate as partners in this project; this is invaluable for research and knowledge development.



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