Water-Energy-Food Nexus and University Initiatives for Mitigation and Adaptation to Climate Change through BRIDGE´s pilot Module.

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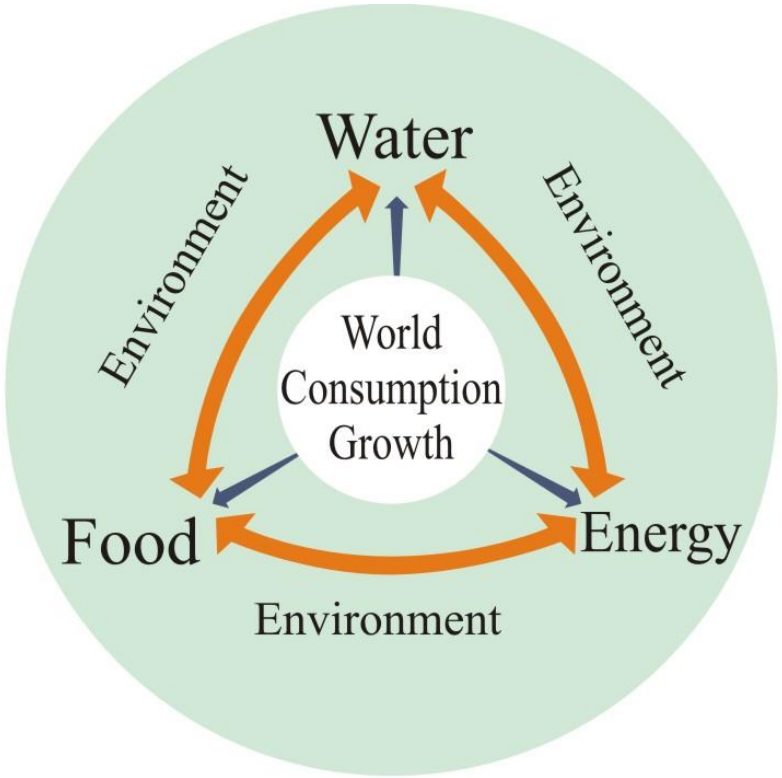
WEF-Nexus Evidences based in literature



- Rapid global population growth is increasing pressures on the consumption and use of natural resources (PDKN/OECD, 2014);
- By 2030, there will be 40% increase in the demand for energy and 30% increase for water (Leese and Meisch, 2015);
- The world needs to increase its food production by 70% to reach food security by 2050 (FAO, 2009b; Miralles-Wilhelm, 2016);
- Water, energy and food are vital to maintain human security. Their interconnections represent important aspects for the UN Sustainable Development Agenda (ESCWA, 2015).

What projects, at the community level, can contribute to improving the resilience of the Water-Energy-Food Nexus in Brazil?

How to raise awareness of police makers and students about the importance of Water-Energy-Food Nexus Nexus?

Which policy frameworks, at local and regional level, can encourage sustainable development of Brazil, and improve its resilience to the challenges of the Water-Energy-Food Nexus?

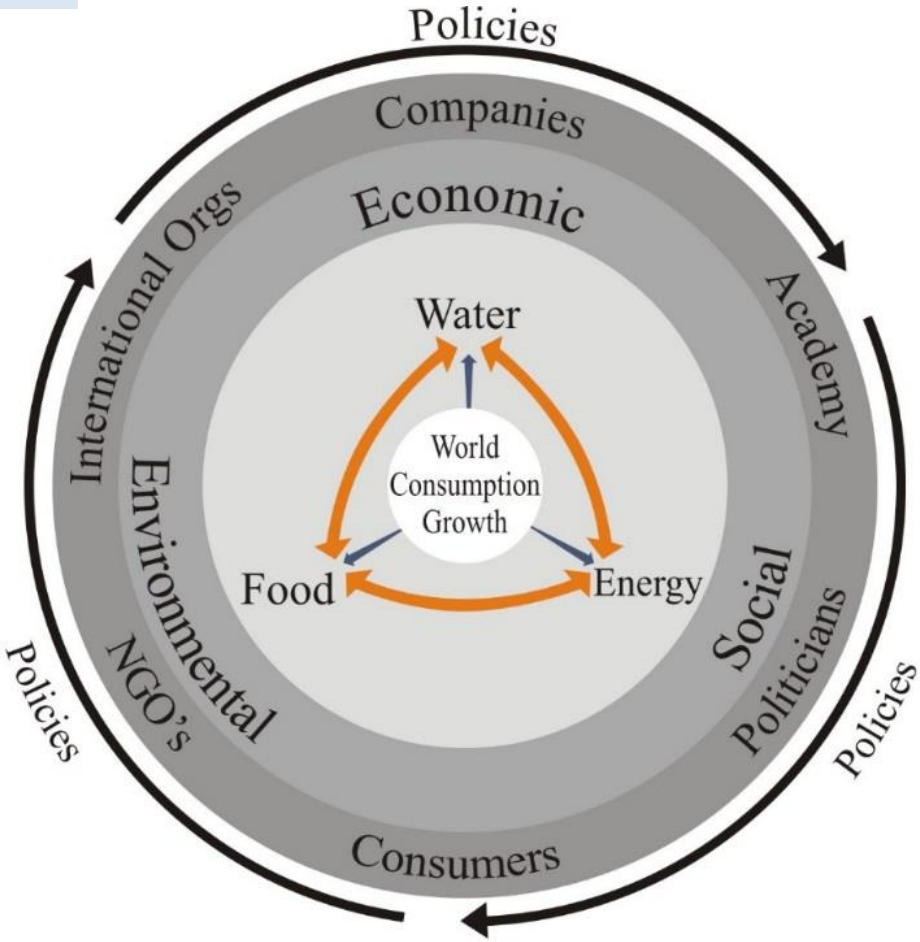
Public Policies for the WEF Nexus aim to

1) Integrate all the sectors

2) Promote governance at all levels

3) Ensure measurement of the impact on local and global resources.

- The regulations of the WEF sectors can help to guide investments and innovations to mitigate negative impacts and share benefits equally among all countries;



Urban Agriculture

Author	City	Method	Article
Barthel & Isendahl (2013	Constantinople	Historical analysis; multi-scalar approach	Urban gardens, agriculture, and water management: Sources of resilience for long-term food security in cities
Lupia & Pulighe (2015)	Rome	Photo interpretation through Google Earth	Water use and urban agriculture: Estimation and water saving scenarios for residential kitchen gardens
Tsuchiya et al. (2015)	Bangkok	Geographical approach analysis	Linking food and land systems for sustainable peri-urban agriculture in Bangkok Metropolitan Region
Cahya (2016)	Jakarta	Multi Dimensional Scaling (MDS)	Analysis of Urban Agriculture Sustainability in Metropolitan Jakarta (Case Study: Urban Agriculture in Duri Kosambi)
Nyantakyi-Frimpong et al. (2016)	Ashaiman	Qualitative field research; group meetings; interviews	Urban agriculture and political ecology of health in municipal Ashaiman, Ghana
Peng et al. (2015)	Beijing	Multifunctional quantitative research, index system, Analytic Hierarchy Process (AHP); triangle ilustration method	Multifunctionality assessment of urban agriculture in Beijing City, China
Pribadi & Pauleit (2016)	Jabodetabek	Multivariated techniques; Geographically Wheighted Regression	Peri-urban agriculture in Jabodetabek Metropolitan Area and its relationship with the urban socioeconomic system
Pölling et al. (2016)	Ruhr	Geostatistical analysis to investigate the patterns of urban professional/commercial agriculture	Professional urban agriculture and its characteristic business models in Metropolis Ruhr, Germany

Urban Agriculture

Florianópolis (Prefeitura de Florianópolis, 2017)	Case studies
Article 3 (II); article 4 (I)	Constantinople (Barthel & Isendahl 2013): resitential gardens and use of organic waste
Article 3 (II); article 4 (V)	Rome (Lupia & Pulighe 2015): use of gardens, parks, and idle-land, as well as use of rain water
Article 1; article 3 (III)	Bangkok (Tsuchiya et al. 2015): street markets, increase in domestic income
Article 1; article 3 (II)	Jakarta (Cahya 2016): residential gardens, increase in domestic income
Article 1 (§ 2º); article 3 (V); article 4 (I, IV, V and VI)	Ashaiman (Nyantakyi-Frimpong et al., 2016): in this case Florianópolis' urban agriculture legislation would help to overcome the issues found in the practice in this city, such as excessive use of agrochemicals, problematic gender roles in labor division, non treated waste water use
Article 1 (§ 1º); article 3 (II, III, IV and V); article 4 (II and III)	Beijing (Peng et al. 2015): multifunctional, interconnection with other sectors (natural and anthropological), resource balance
Article 1; article 3 (II, III, IV and V); article 4 (I, II, III, IV and V)	Jabodetabek (Pribadi & Pauleit 2016) : multifunctional
Article 1; article 3 (III)	Ruhr (Pölling et al. 2016): commercial approach

BRIDGE´s Pilot Module aims to

- **Demonstrate the applicability of Water-Energy-Food Nexus through a Solar Hydroponic Greenhouse.**

BRIDGE´s Pilot Module aims to

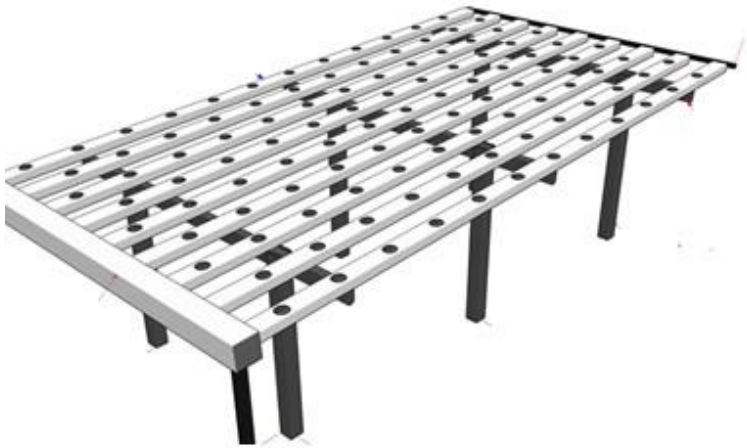
- Check the feasibility of a solar hydroponic greenhouse for risk communities;
- Strengthen the teaching and research for water, energy and food security through a Solar Hydroponic Greenhouse;
- Promote the sustainable development goals through education and the Solar Hydroponic Greenhouse;
- Promote the sustainability awareness of the communities surrounding the university’s campuses.

BRIDGE´s Pilot Module

- Opportunity to produce food for regions of the planet with water, energy and/or food scarcity;
- The production do not use fertile land and receive through all its nutrients through tube for its healthy growth;
- Improved working conditions;
- Reduce the use of agrochemicals;
- Reduce the water consumed;

BRIDGE´s Pilot Module

- Located in the Department of Agronomy
- 7m x 21m, 12 photovoltaic panels (20m^2);
- Produces 2.200 plants/month;
- Different types of nutritive solutions;
- Until Now: saving 90% of water and 70% of fertilizers; 0% energy cost (0% fossil fuel use); 0% agrochemicals;



Bancada hidropônica

BRIDGE´s Pilot Module

Next Steps – WEF nexus and Solar Hydroponic Greenhouse

- To analyze the possibility of other species (vegetables, medicinal herbs, flowers);
- To analyze the possibility of using local produced biofertilizers;
- To analyze the possibility of Aquaponics (plants and fish production);

BRIDGE´s Pilot Module

THANK YOU

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