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Educational, Scientific and  
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UNESCO Chair on Urban Water -  
Quality, Management, Recovery and Reuse  
University of São Paulo, Brazil



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Intergovernmental  
Hydrological Programme

# THE AMAZON-SANITATION NEXUS

## How can 1m<sup>2</sup> of Tropical Forest help mitigating Grey Water Footprint Risks in South American Megacities?

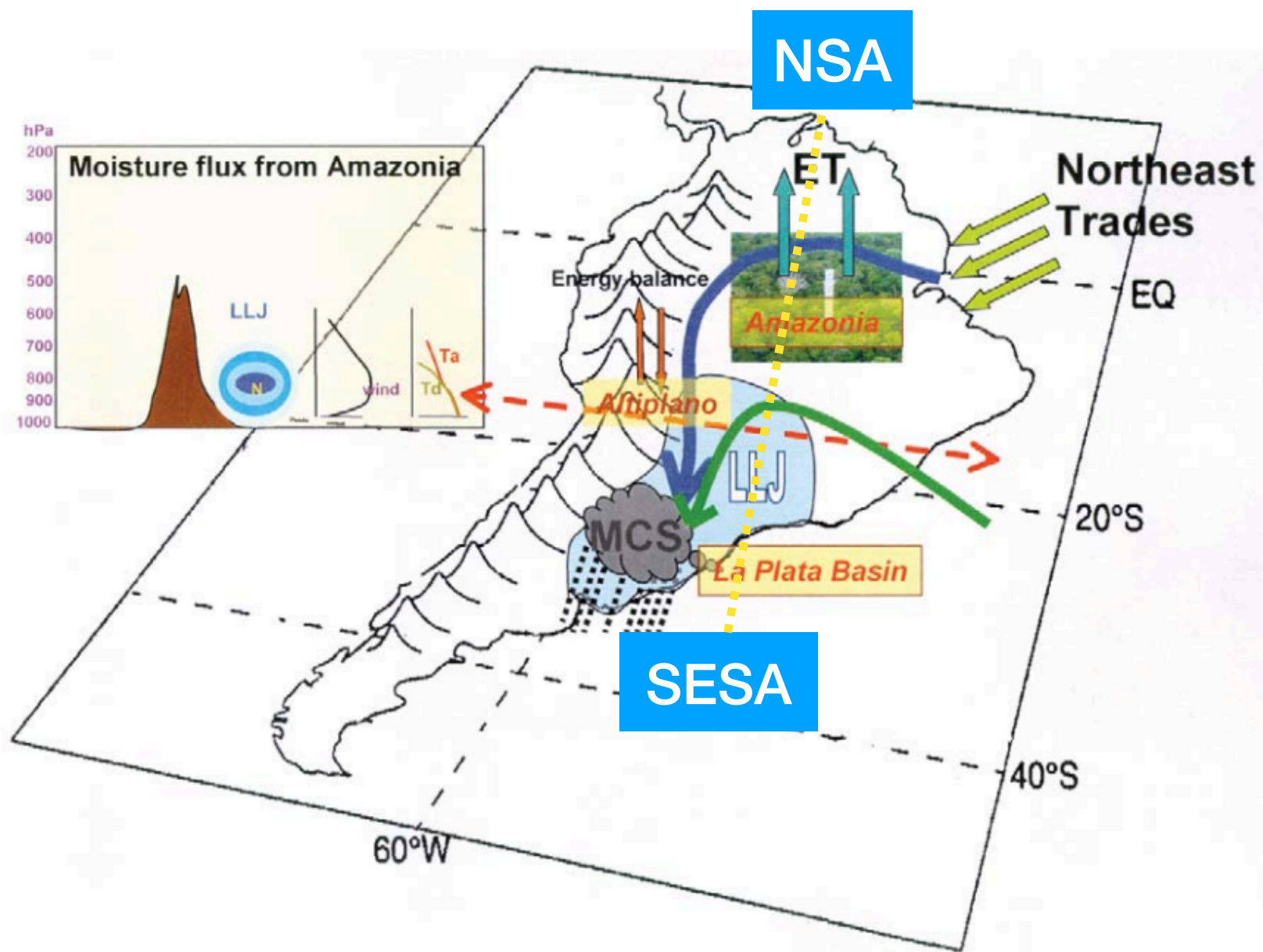
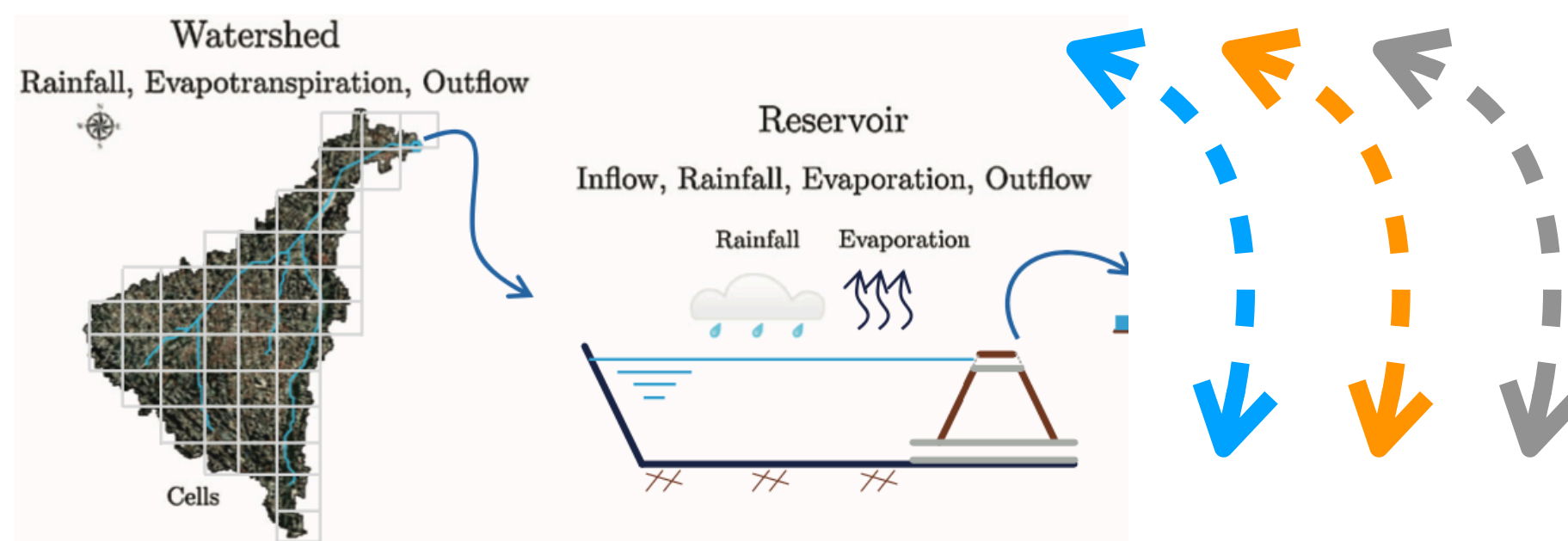
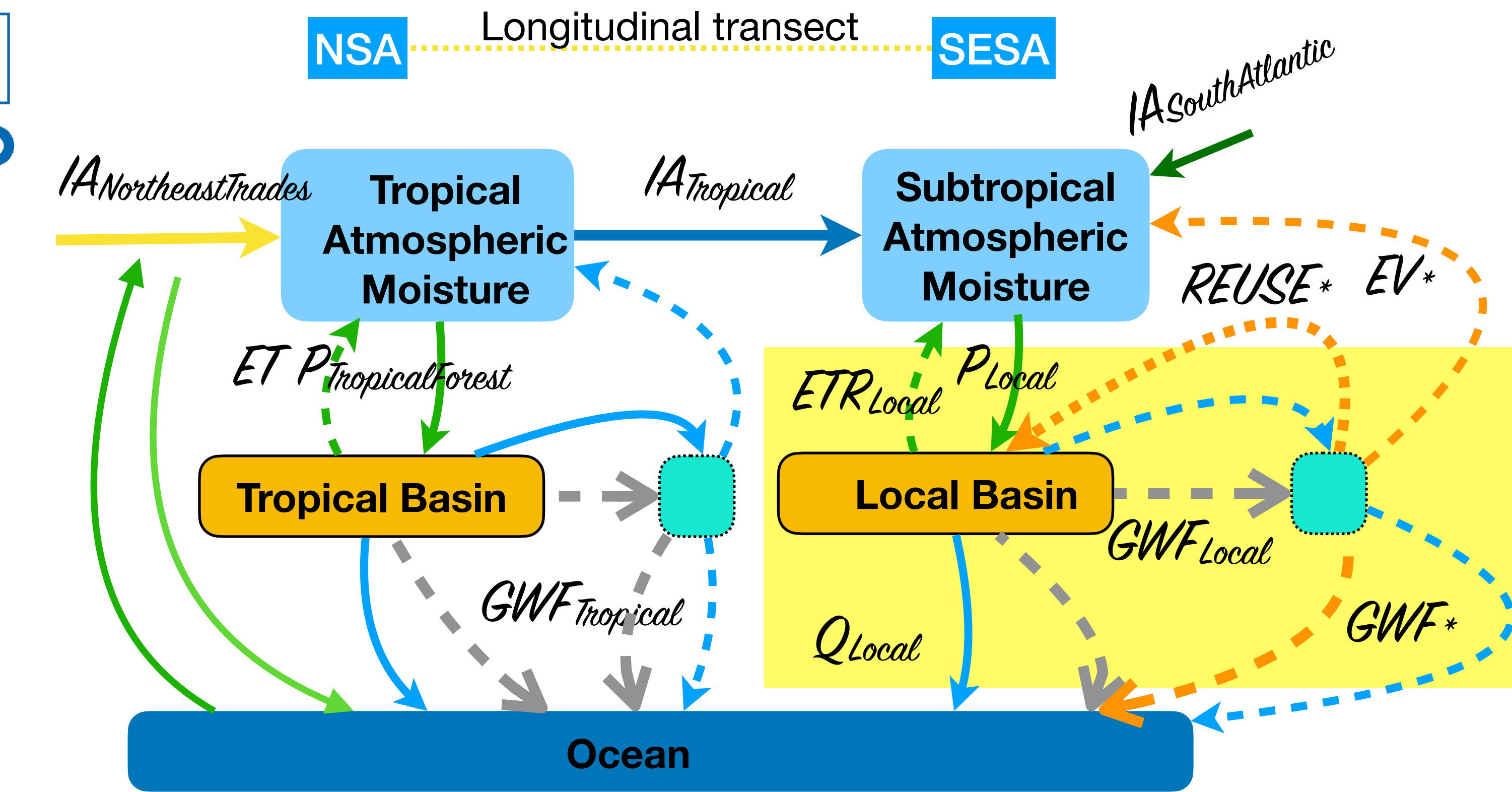


FIG. 1. Schematic diagram of elements relevant to poleward moisture transport over South America. Blue and green arrows depict the moisture transport into the continent from the tropical and South Atlantic Ocean, respectively. The inset represents a vertical cross section of the northerly flow along the red dashed line displayed in the diagram, including wind and temperature profiles representative of the LLJ core.



**"REWASH"**  
Recycling Water  
Assets for  
Sustainable Habitats

Mendondo et al (2023) Community Actions To Accelerate Circular Economy Transition with Nature-based Solutions for Urban Waters Reuse under Change, In: Fatta-Kassinos and Rizzo (orgs.) "New opportunities in wastewater science and engineering Reuse, recovery, valorization, surveillance", WEC&N Webinar, 8 March, 2023



Synergism Brazilian National  
Institute of Science & Technology



Climate Change

INCT MC2  
INCT para Mudanças  
Climáticas - Fase 2



“Absorptive”  
Resilience

in alliance with other FAPESP projects ( C4AI #2019/07665-4, Belmont  
Forum MADIS #2019/23393-4, CeMEAI #2013/07375-0), INCLINE/USP,  
CEPED/USP & UNESCO Chair on Urban Water/USP (\*)

“Adaptive”  
Resilience

CASH Paradox  
- Coevolution  
of the Amazon-  
Sanitation-  
Hygiene  
Paradox



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Center for  
Artificial  
Intelligence

BRONZE-2-GOLD  
- BRazilian Offsets  
for Net-Zero  
Energy Towards  
GOals for  
Leveraging  
Development



ONSadapta

National Observatory of  
Water Security & Adaptive  
Management

BELMONT  
FORUM



CeMEAI  
CEPID - Centro de Ciências  
Matemáticas Aplicadas à Indústria



Fighting Hunger



“Transformative”  
Resilience

UNESCO-IHP IX Phase (2022-2029), UNEP WWQA/GEMS, WMO Strategic Plan,  
#Act4SDGs, IBPES & COP27 to accelerate science-for-policy adaptation with  
disruptive open innovation for climate-resilient startups and jobs for a low-carbon  
economy under SDGs (2022-2030)

(\*) IPCC/AR6, Braz. Water Security Plan  
(PNSH, 2019-2035), Braz. Water  
Security Act (#14026/2020)  
Braz. Payment for Ecosystem Service

Sources:

Mendondo et al (2023) - FAPESP-22/08468-0 - <https://bv.fapesp.br/pt/auxilios/111385/caracteristicas-da-evolucao-de-eventos-de-secas-rapidas-e-mecanismos-de-respostas-a-mudanca-climatic/>  
Mendondo et al (2023) - BRONZE-2-GOLD : BRazilian Offsets for Net Zero Energy towards GOals for Leveraging Development, EESCin-Energisa Meeting, 7-3-2023



# Coevolution of the Amazon-Sanitation-Hygiene C.A.S.H. Paradox

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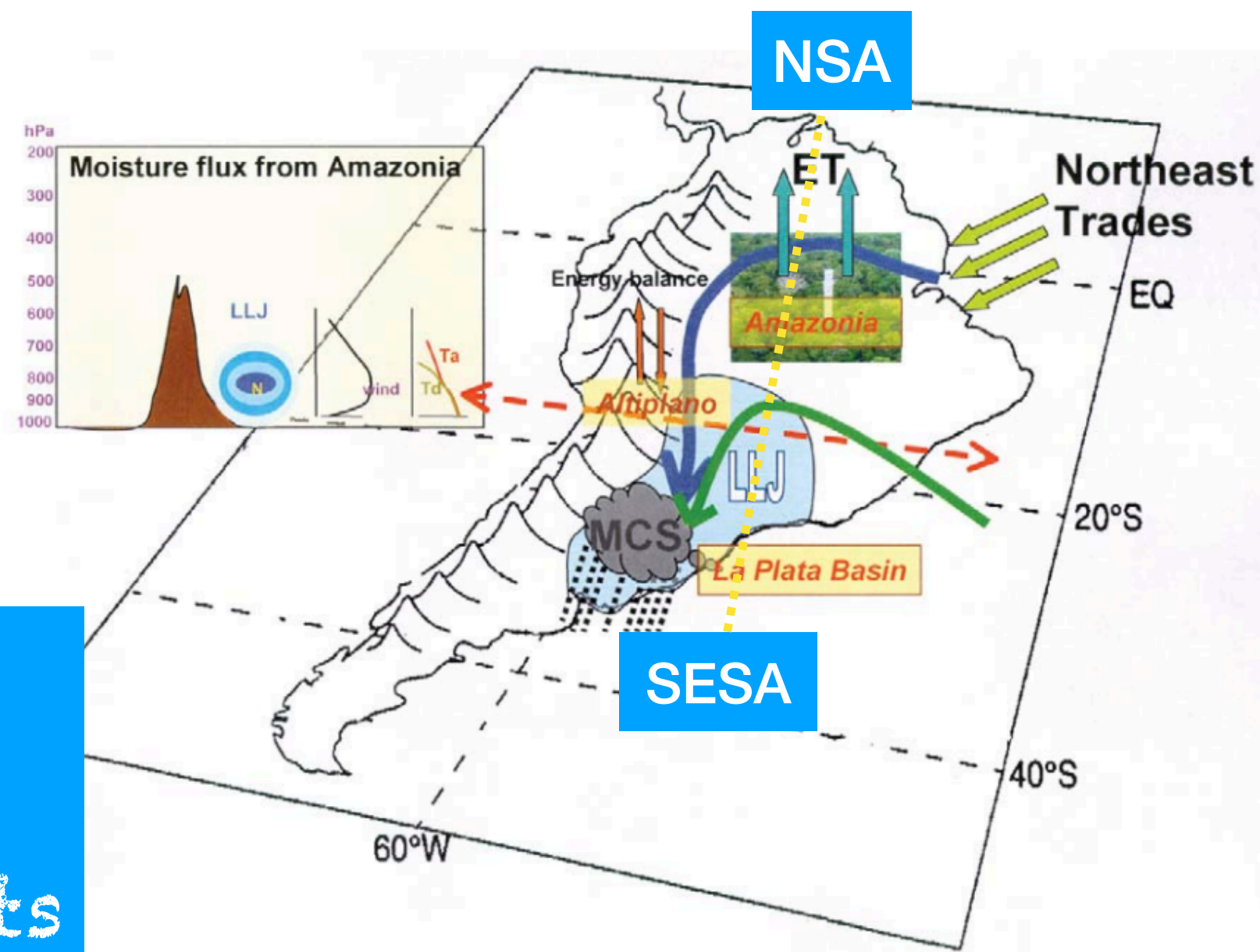
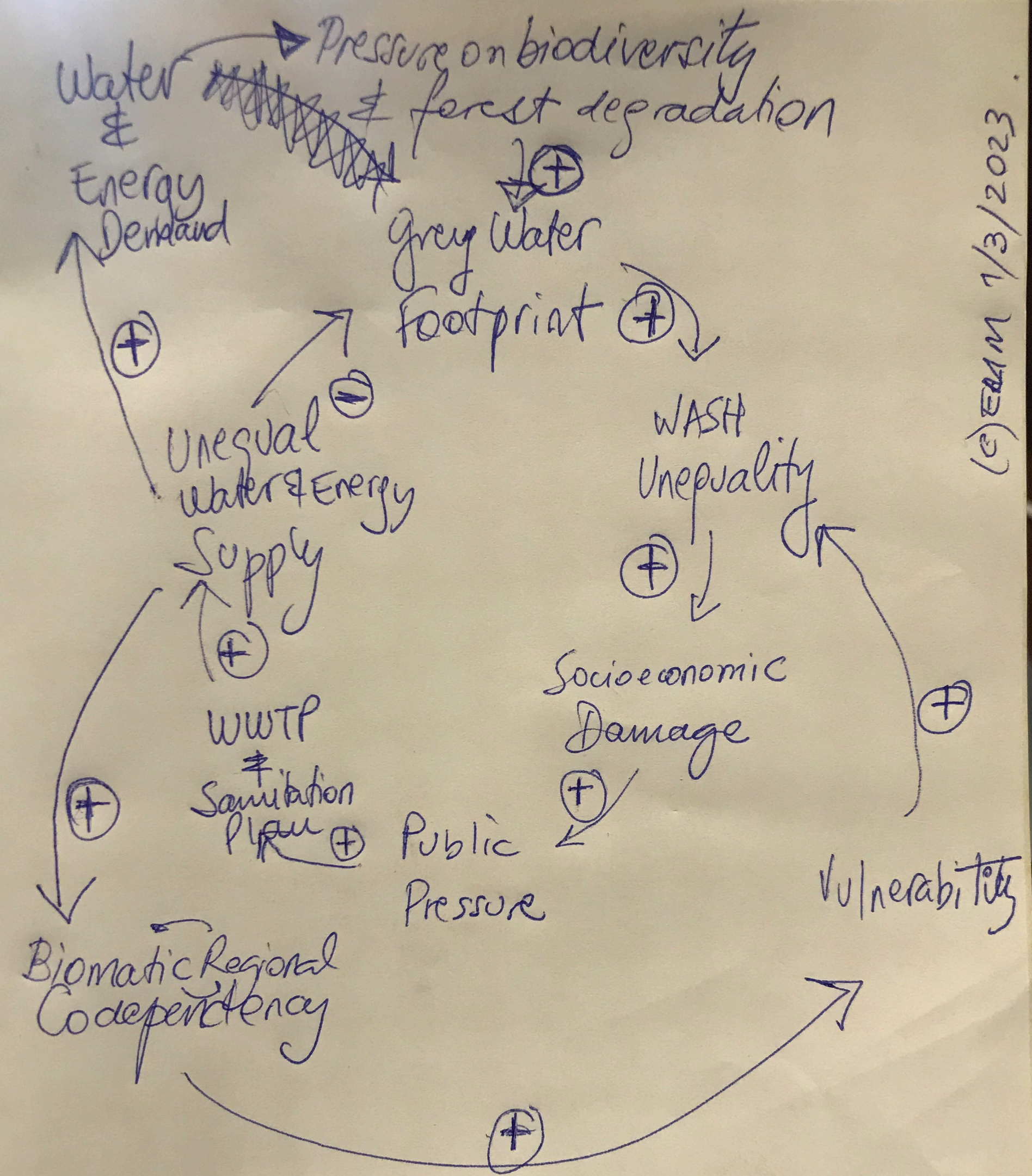


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Recycling Water  
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Causal loop diagram showing:  
 (1) the traditional response to lack of sanitation (↑ Urban WWTP) which consists of expanding WWTPs + unequal water & Energy Supply (inner cycle)  
 (2) the supply-demand cycle; (3) the regional biomimetic effect + WWTP effect

(c) ERAM 1/3/2023