

URBAN HYDRO-SOCIOLOGY: THE MUTUAL CARE BETWEEN WATERS AND CITIZENSHIP IN BRAZIL



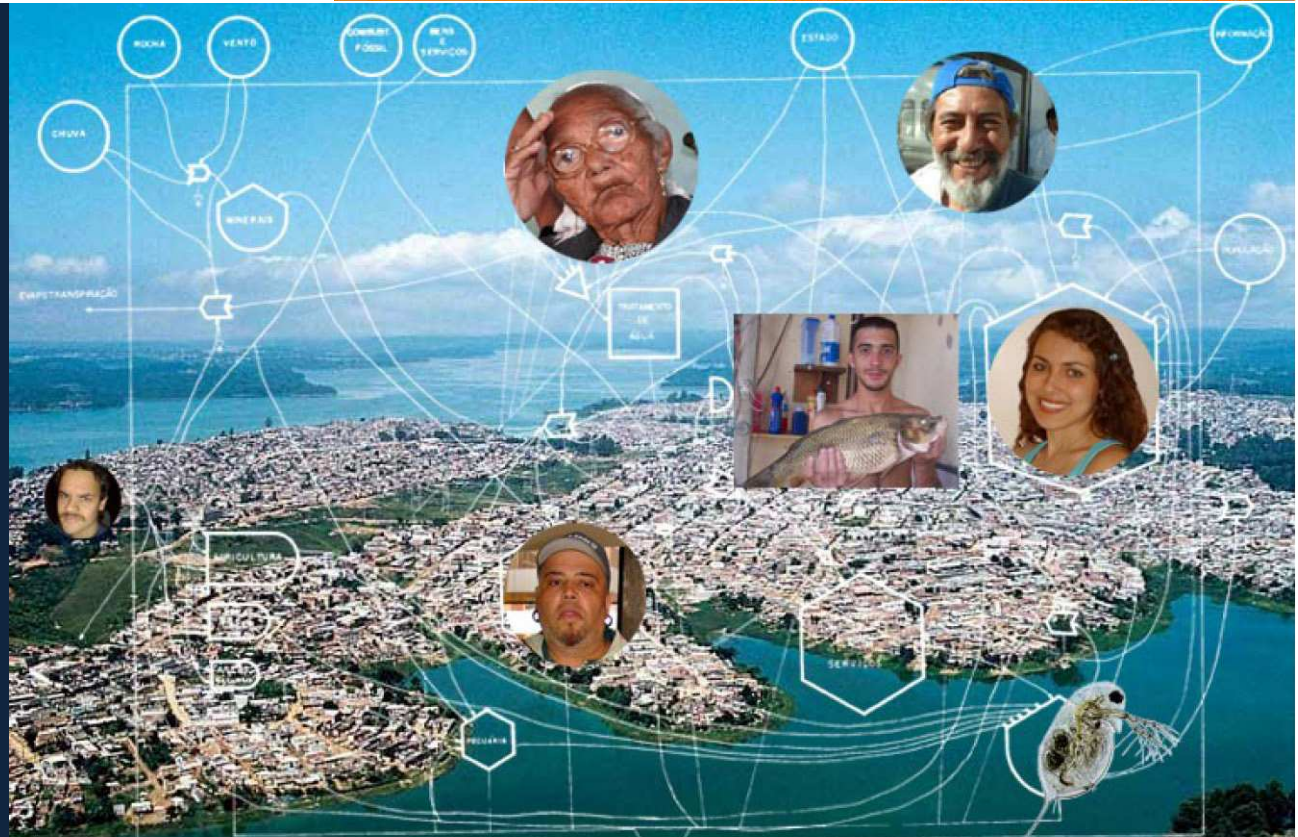
UNIVERSITÉ
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1. introduction



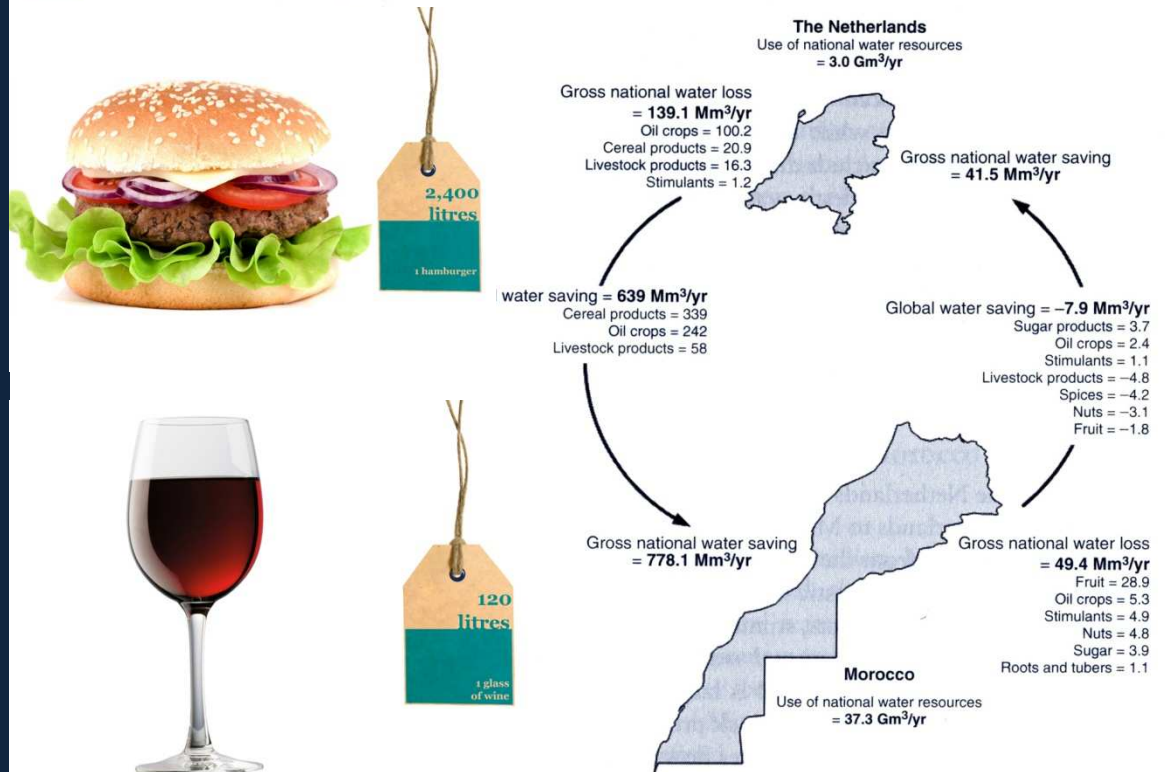
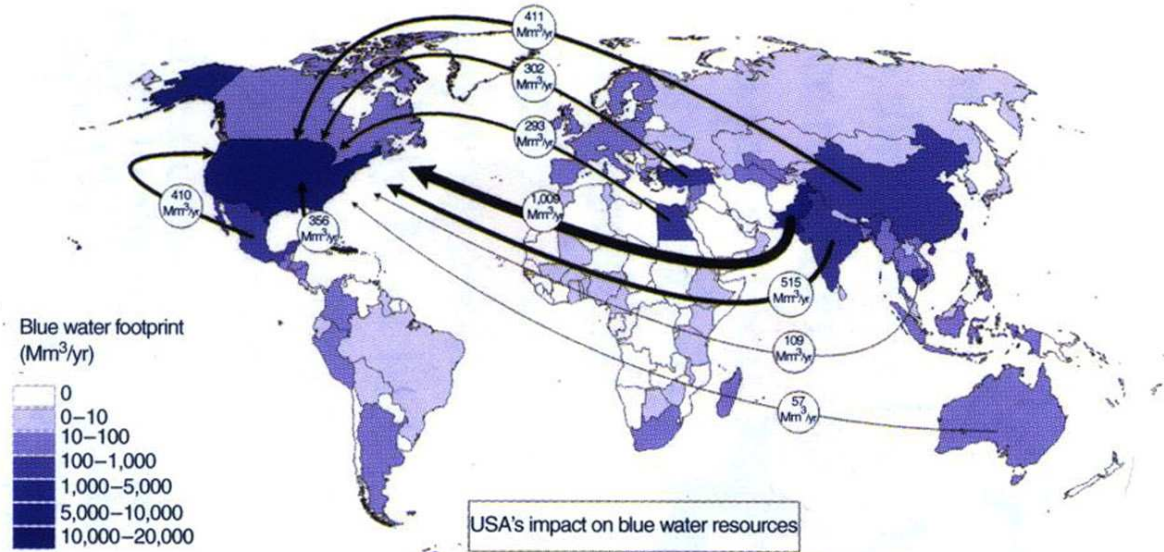
Patrick Geddes
Reciprocity

2. material

MATERIAL

Water Footprint indicator

The Anhumas Project



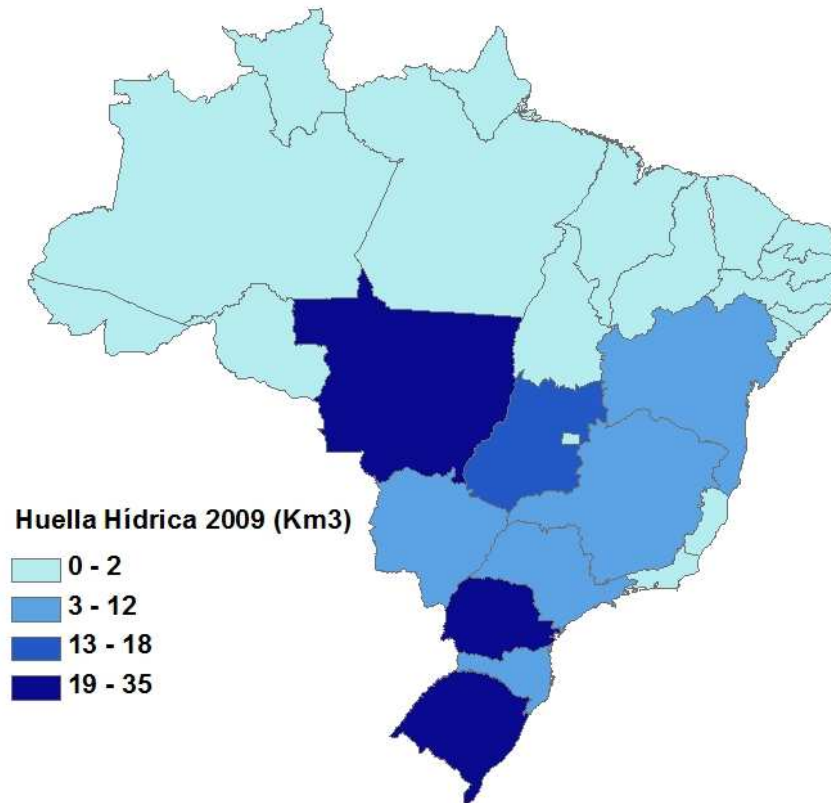
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Water Footprint Space-Time dynamic of soja production (total = 122,5 km³, 2009)



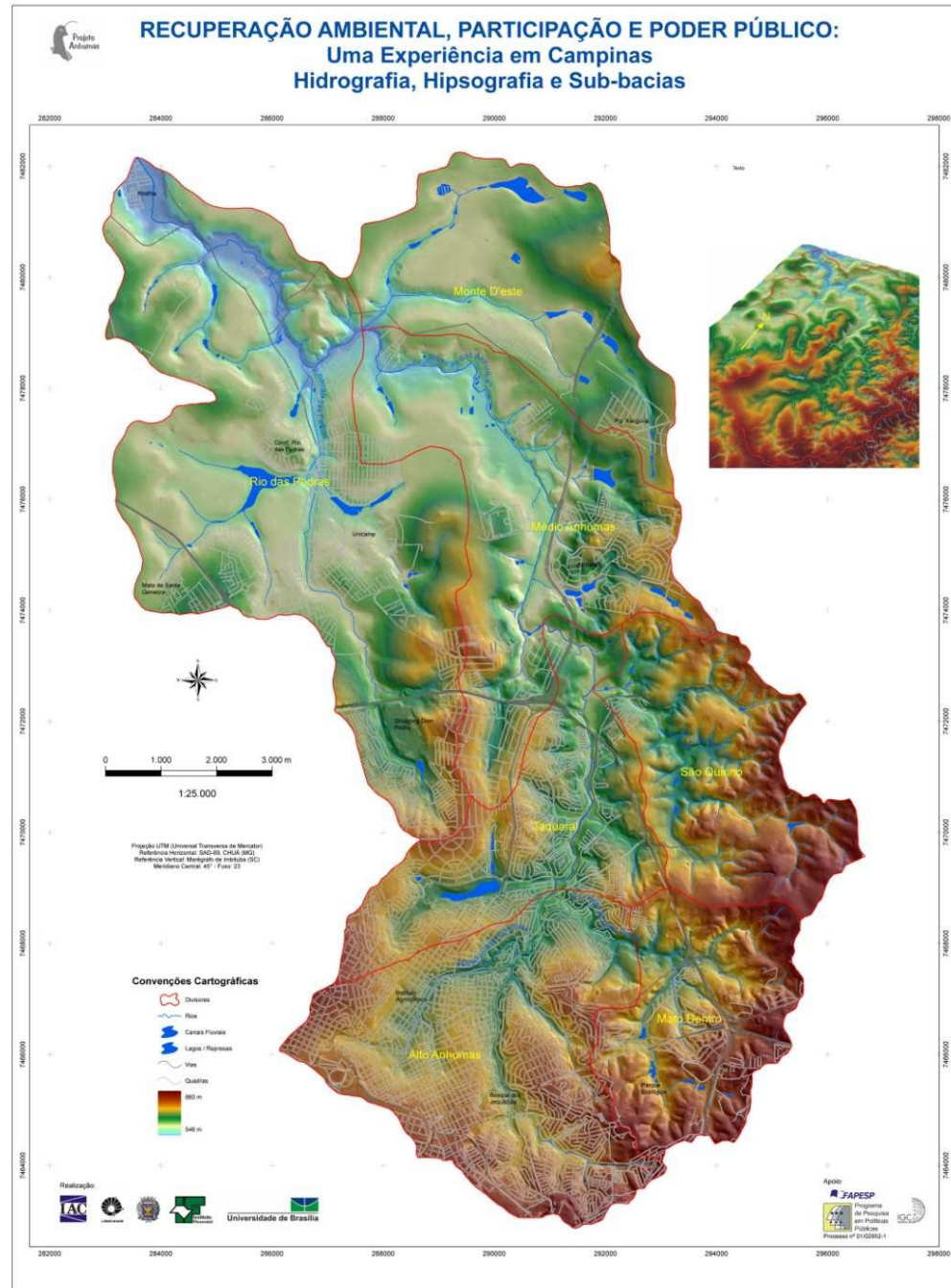
[From GARRIDO & WILLAARTS (18/2/11). VII CONGRESO IBERICO SOBRE PLANIFICACION Y GESTION DEL AGUA Talavera de la Reina (16-19 de febrero de 2011) V PLENARIO. CONOCIMIENTO Y TECNOLOGÍAS DEL AGUA]

<http://www.slideshare.net/NuevaCulturadelAgua/alberto-garrido-y-brbara-willaarts-y-la-huella-hdrica-en-el-vii-congreso-ibrico>

MATERIAL

Water Footprint indicator

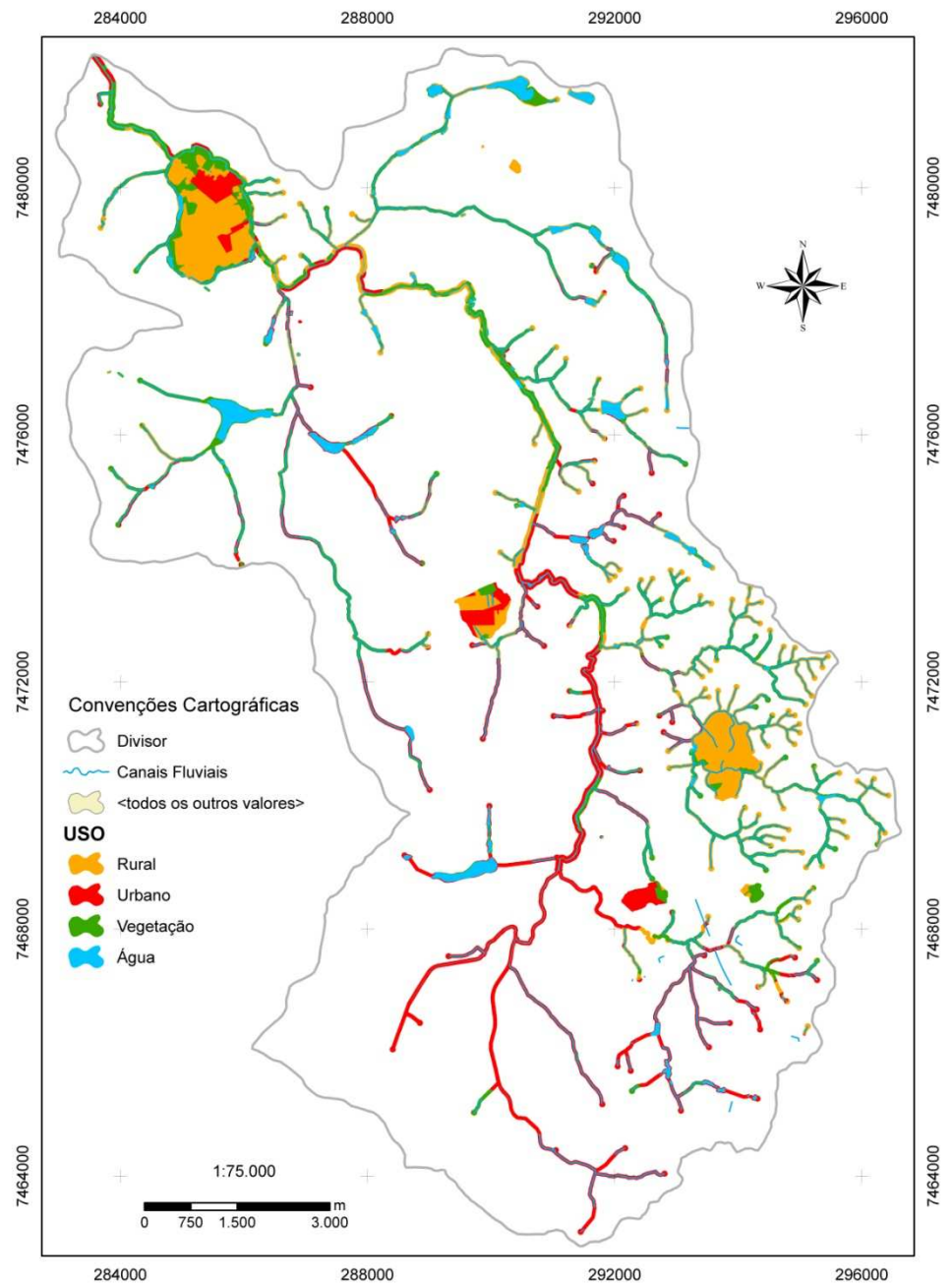
The Anhumas Project



MATERIAL

Water Footprint indicator

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MATERIAL

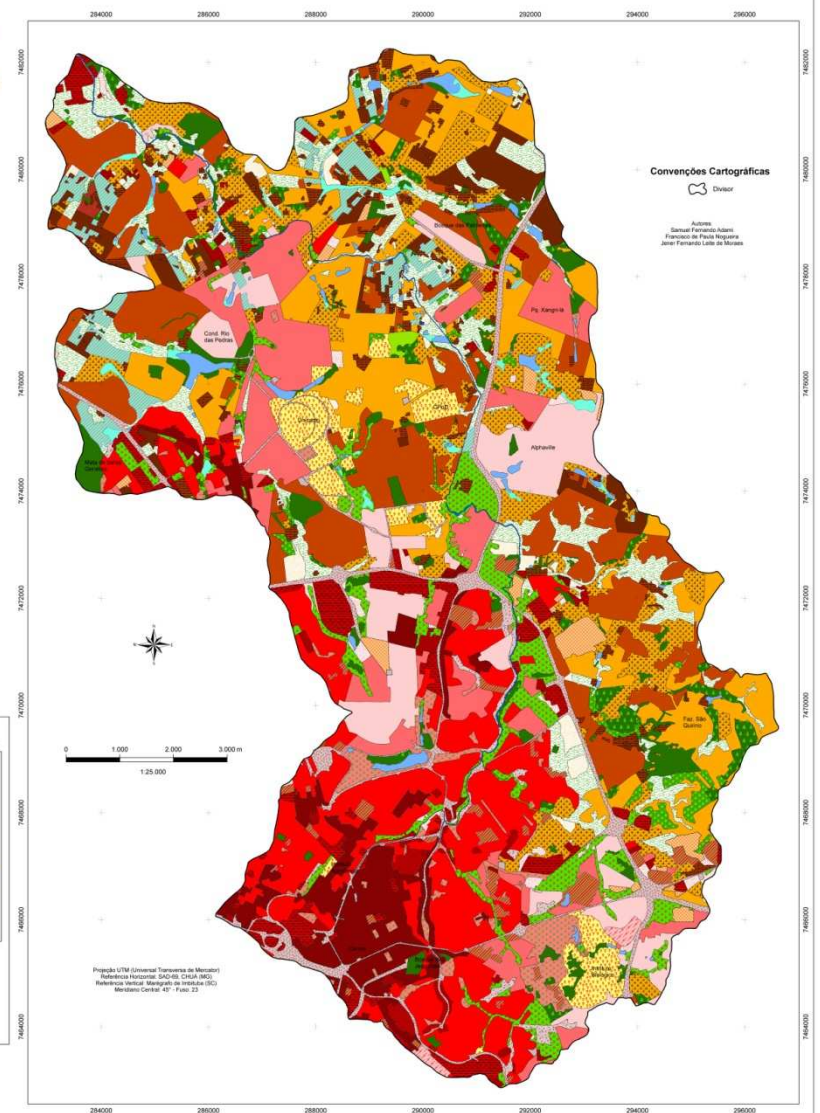
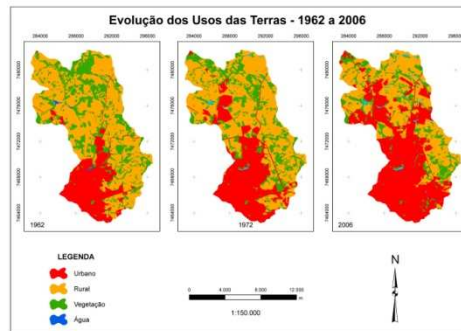
Water Footprint indicator

The Anhumas Project



RECUPERAÇÃO AMBIENTAL, PARTICIPAÇÃO E PODER PÚBLICO: Uma Experiência em Campinas Mapa de Uso e Ocupação das Terras

LEGENDA	
Uso	Ocupações
1 Urbano	01.01 - Residencial unifamiliar - alta densidade
	01.02 - Residencial unifamiliar - média densidade
	01.03 - Residencial unifamiliar - baixa densidade
	01.04 - Residencial multifamiliar
	01.05 - Residencial familiar misto
	01.06 - Favela / Subhabitação
	01.07 - Comercial / Industrial
	01.08 - Comercial - Parque
	01.09 - Misto Residencial / Comercial
	01.10 - Cemitério
	01.11 - Praças / Áreas de Lazer
	01.12 - Subestação Energia Elétrica
	01.13 - Sistema de Transporte
	01.14 - Solo Exposto
	01.15 - Macega / Capinzal
	01.16 - Expansão Urbana
	01.17 - Centros de Pesquisa e Educação
2 Rural	02.01 - Cultura Arbórea
	02.02 - Cultura Herbácea
	02.03 - Pasto
	02.04 - Pasto Sujo
	02.05 - Construções
	02.06 - Solo Exposto
	02.07 - Horticultura
	02.08 - Misto
	02.09 - Agroindústria
3 Vegetação	03.01 - Mata
	03.02 - Cerrado
	03.03 - Várzea
	03.04 - Reflorestamento
	03.05 - Capoeira
4 Água	04.01 - Rios
	04.02 - Lagos / Reservatórios



3. methods

METHODS

First phase:

Experimental phenomenology

Second phase:

Application of experimental indicator
on urban microbasin

- **EXPERIMENTAL PHENOMENOLOGY**

EDMUND HUSSERL (1859-1938):
main foundation and development.

FRANCISCO VARELA (1946-2001):
on biological basis of cognition, studied
Husserl and Merleau-Ponty and applied it
to research in neurobiology (*autopoiesis*
and *neurophenomenology*).

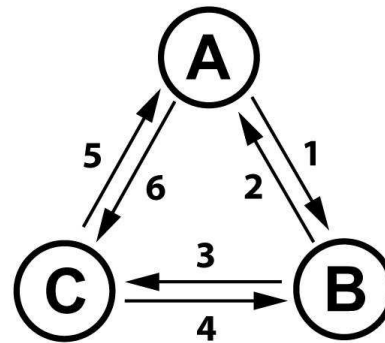
- Descriptions in Phenomenology were to take place from a highly modified "first person" viewpoint, studying phenomena not as they appear to "my" consciousness, but to *any* consciousness. Husserl believed that phenomenology could thus provide a firm basis for all human knowledge, including scientific knowledge, and could establish philosophy as a "rigorous science" of measurable experience and intention.
- Phenomenology, in Husserl's conception, is primarily concerned with the systematic reflection on and analysis of the structures of consciousness, and the phenomena which appear in acts of consciousness.

METHODS

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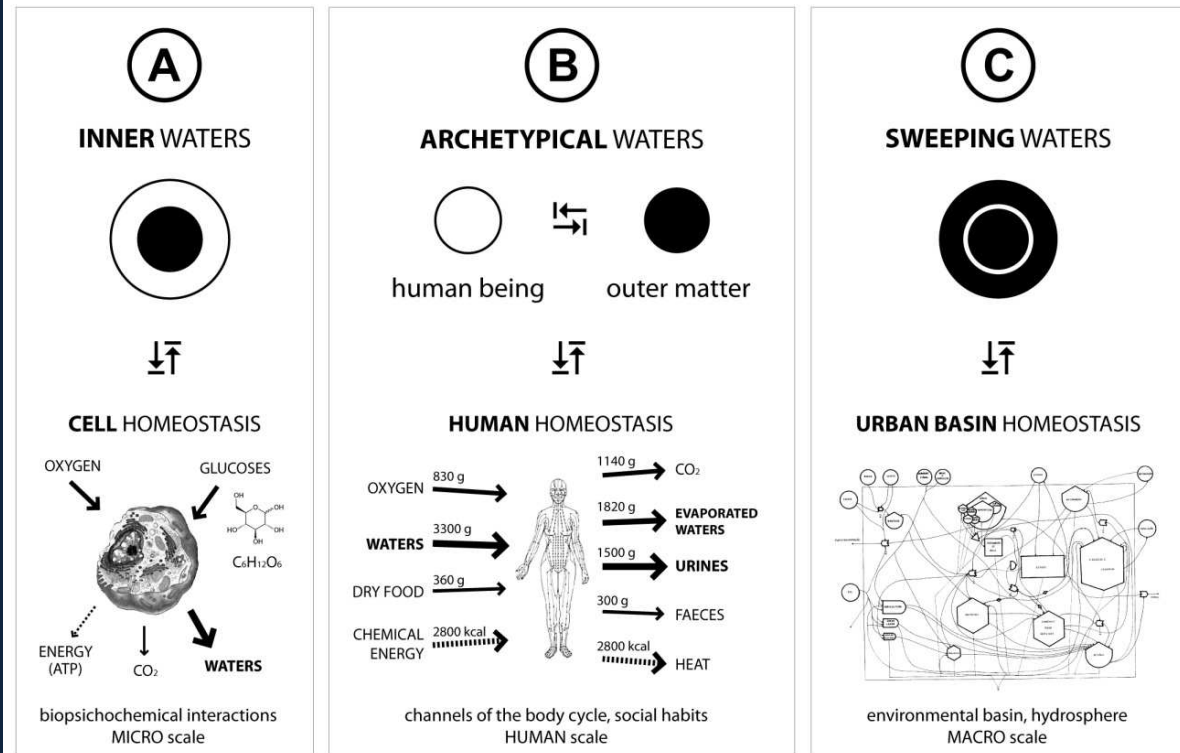
waters cycle



thinking-acting model

The Waters Cycle:

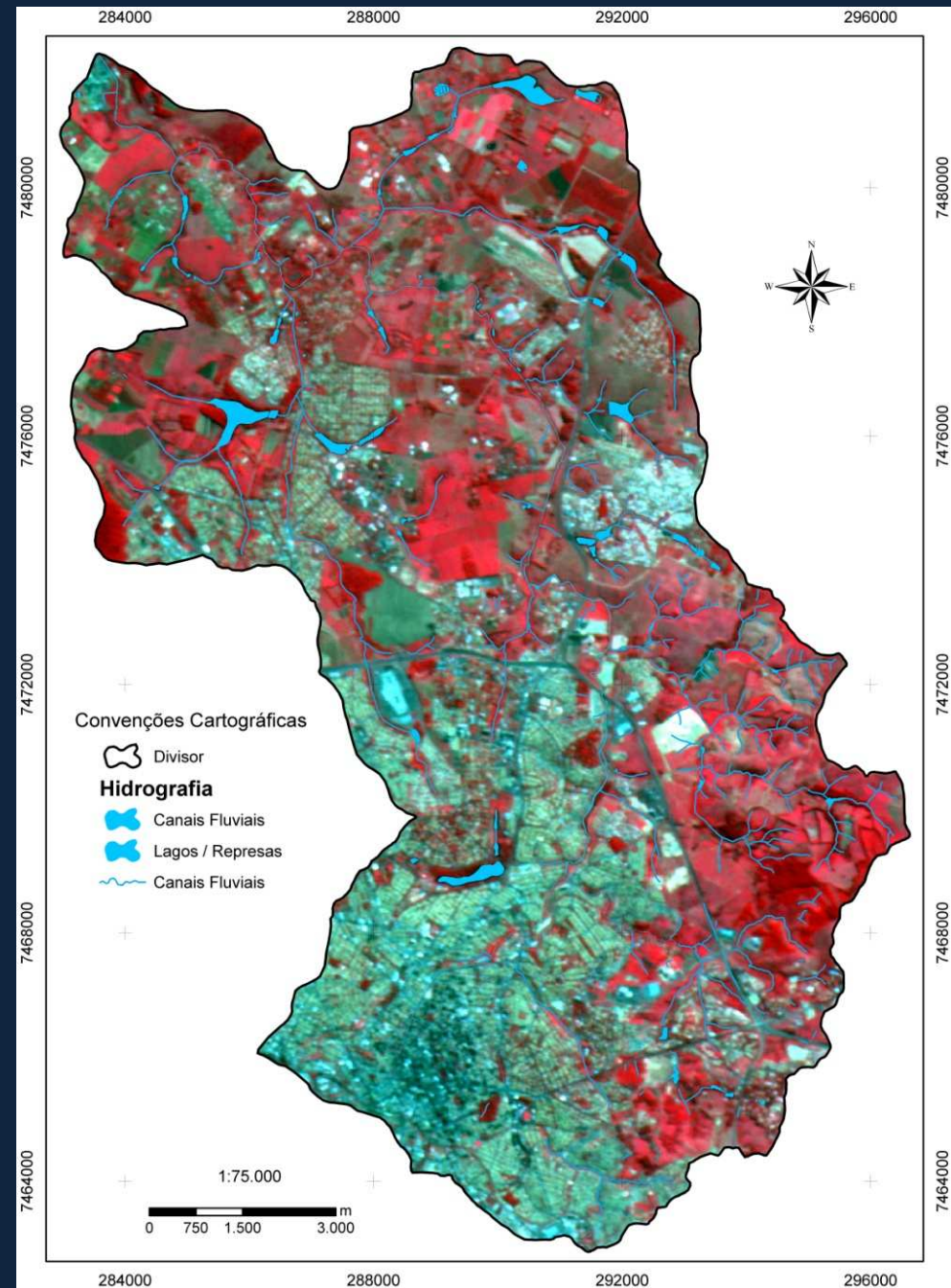
- (A) inner
- (B) visible hydrological cycle
- (C) invisible hydrological cycle, climate
- (1) wasted waters from the human catabolism (sweat, tears, breathing exhalation, faeces, urine)
- (2) fresh waters for human metabolism, breathed vapours and waters embedded in foods
- (3) infiltration and evaporation processes
- (4) rainfall, spring rising
- (5) amniotic liquid, sub aquatic immersion, skin permeability, body humors
- (6) aqueous humor, radiestesys.



METHODS

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METHODS

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- **Previous quantitative** reflections:
production of traded ...

- WF treats **movable** goods and services for consumption (HOEKSTRA et al.)
- ... but can incorporate **immovable** goods and services (McCORMACK et al.): BUILDINGS, water embodied in construction and real estate

20.000 litres /m2 gross floor area

TRANSLATING 7 TOP URBAN HABITS INTO URBAN WATER FOOTPRINT

METHODS

First phase:
Experimental phenomenology

Second phase:
Application of experimental indicator on urban microbasin

Administrative job

• **PRODUCTION**

1,5 children and 3,3 indiv./family

• **REPRODUCTION**

Volkswagen Gol using 3-lane highway

• **MOBILITY**

Arroz, feijao, farofa e pao branco

• **NUTRITION**

Apartment into a 7 floor condominium

• **HOUSING**

Watch a football match on TV

• **LEISSURE**

Reading a book: 31% of population

• **CULTURE**

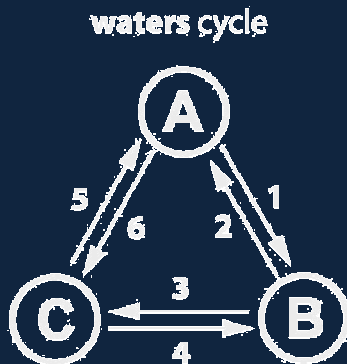
METHODS

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- **COMPARATION BETWEEN GLOBAL HYDROLOGICAL BALANCE (water available at basin scale) AND URBAN WATER FOOTPRINT (water effectively used)**

- **7x3 MATRIX:
CONFRONTATION AMONG THE 7
URBAN HABITS AND:**

health

social added value

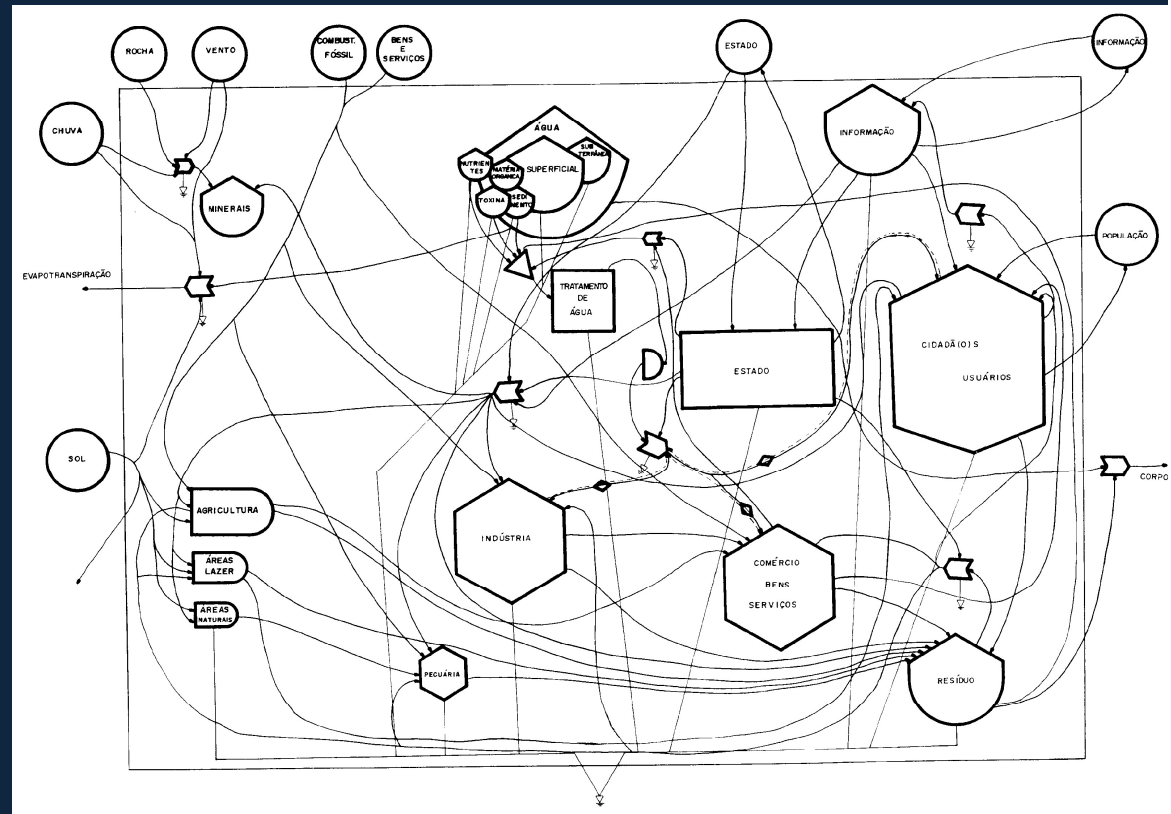
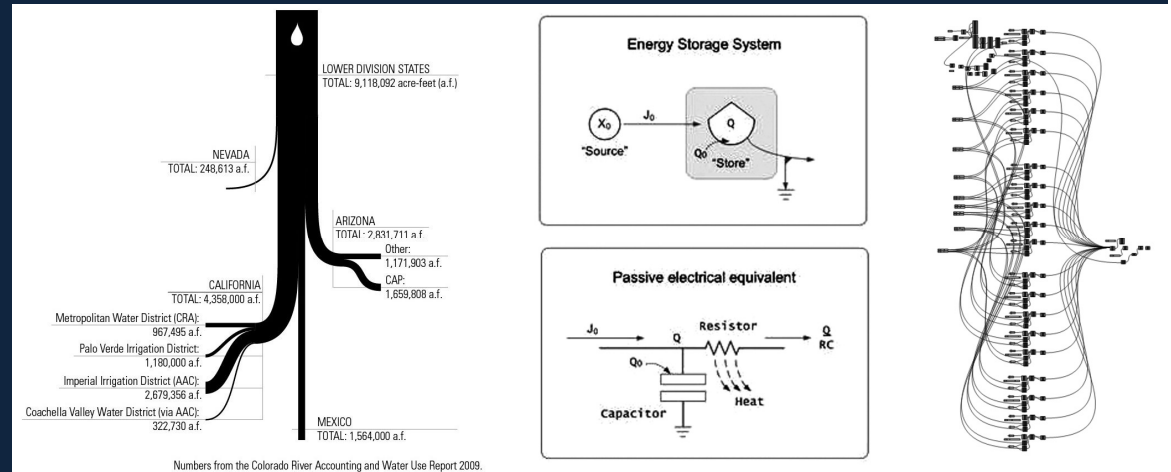
% land use

shown on a Waters Cycle Graph

METHODS

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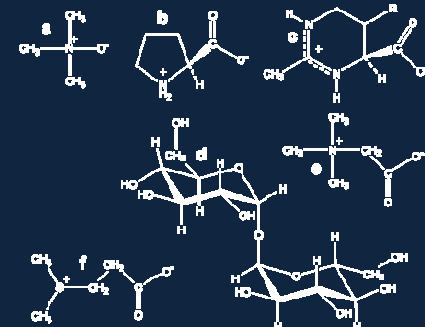
4. discussion

DISCUSSION

- *Lack of qualitative research*
- *there is a significant risk in relying on virtual-water related methods in order to guide policy conclusions*
- *water scarcity is a new myth?*
- *WF promotes international trade (geopolitics)*
- *price of basic foods and local speculation (Mexico case)*

DISCUSSION

- *Exist various types of water, not only H₂O*
- Green – Blue (by FALKENMARK)
- Virtual (by ALLAN)
- Grey, Black, Rain (at URBAN HYDROLOGY)
- Archetypical (by ILLICH)
- Depending on tastes (by ARROJO)
- Mineral-medical (at HYDROGEOLOGY)
- Citoplasmatic, polarized, pressurized, ionized (at MEDICINE)
- Kosmotropic – Chaotropic (by WIGGINS at BIOMEDICINE RESEARCH)



5. conclusion

CONCLUSION

Practical sense of Water Footprint indicator into:

- Social Actors
- Public Policies
- Urbanism & Regional Planning between Private & Public spheres

- *Waters take care of our health in an autopoietic and spontaneous way, so*

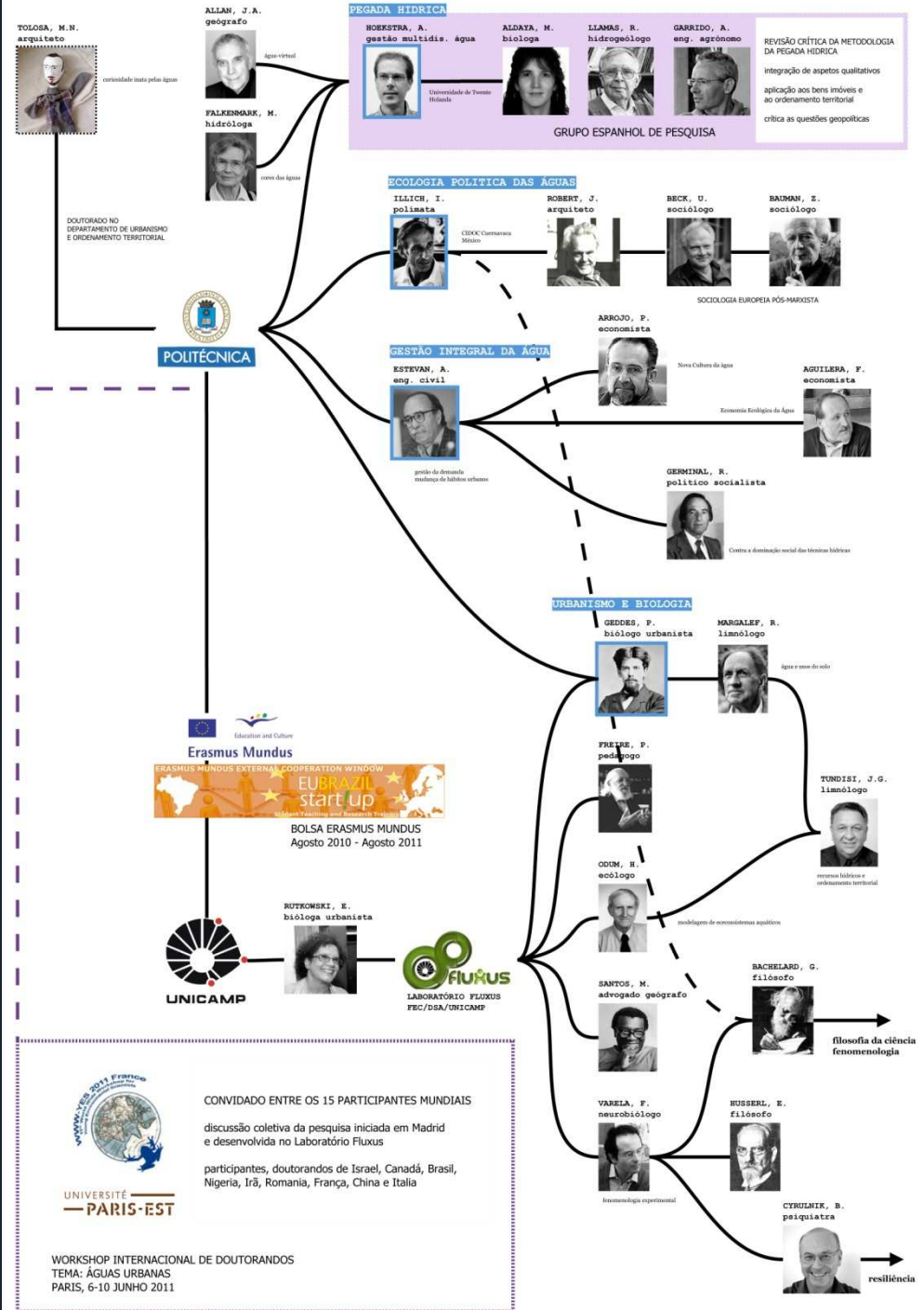
what kind of knowledge about Water Footprint Urban Politics should we carefully practice in order to persist in that healthy, wealthy reciprocity?

REFERENCES & FINAL REFLECTION

Water exploited (as a resource)
Water dominated (as a potential risk)

Resource vs Reserve
Risk vs Resilience

MAPA BIBLIOGRAFICO MENTAL DA PESQUISA: DA PEGADA HIDRICA À ECOLOGIA POLITICA DAS ÁGUAS



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Gracias
Merci beaucoup
Obrigado
Terima kasih
Tsie-tsie
Min fadlic
Muğumiri
Thanks
i!