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1 Introduction

International trade and protection of the environment.

The rule of the Agenda 21 of United Nations.

**WTO** and sustainability.

**Water** has not been considered because:

i. the multiple uses of water;
ii. its process of commoditization;
iii. the legal weakness of the global agreements of fresh water.

The rule of **virtual water** (Hoekstra, 2010).
1 Introduction

The WTO has gradually lost position due to the expansion of free trade agreements (FTAs).

The rule of the global value chains (GVCs).

Research questioning:

*How can water security be critically discussed in international trade, especially within global value chains?*

The paper seeks to contribute to water security discussions within global value chains from a critical perspective.
2 Problematizing international trade and water security

The nature and the multilateral trade debate.

Although the value of trade in agricultural products represents only 14% of manufactured goods trade (UNCTAD, 2014), agriculture's impact on water is worse than in industry because they represent approximately 70% of the water used on the planet (OECD, 2016).

22-30% of the water present in terrestrial systems is used to produce food (Falkenmark & Rockström, 2004).

Water scarcity has reached 40% of the population of the planet. Together with clime and population growth, trade in agricultural goods is considered the most important global factor for reducing water security. There is a mutual interference between trade and water availability (Lenzen et al, 2013; Vörösmarty et al, 2015).
3 Mega-trade agreements and the possible impacts on water

The **WTO** has lost its relevance (Matsushita, 2014).

A **new arrangement** has been drawn in international trade.

The nexus between **FTAs** and **GVCs**.

The rule of the **Transatlantic Trade and Investment Partnership (TTIP)** and the **Trans-Pacific Partnership (TPP)**.

The **investor-state disputes**.
The notion of global value chains involves market-leading firms and their huge supplier networks (ECLAC, 2013).

Examples of actions of WS in GVCs: food, textile and personal cleaning sector. Specially: water efficiency, mandatory ISO 14046 certification, water treatment, re-use, training, participation in watershed management and reforestation.

Virtual water. Some numbers: Approximately 15% of the water used in the world is destined for exporting virtual water; 67% of this is related to international trade in crops (Dalin, 2012). China, Brazil, India, the United States and Canada are the largest exporters of virtual water in the world (Feng & Hubace, 2015). Brazil exports around 112 trillion liters of freshwater in the virtual mode (Globo, 2012).
4 Value chains, leading companies and virtual water. (In) safe waters in global flows

China and India, which respectively, extract 32% and 20% of their available water.

In the Brazilian regions with the highest agricultural production, water scarcity has been felt significantly.

The fruit sector. International buyers in a vertical relationship lead the CGVs in this segment. They are usually large supermarket groups, determining how fruits are produced, harvested, transported, processed and stored, from an interdependent perspective (Hawkes & Ruel, 2011; Henson & Humphrey, 2015).
5 Method

- Descriptive
- Exploratory
- Quali-quantitative

Table 1: Variables in FTAs – trade and water security

<table>
<thead>
<tr>
<th>Trade variables</th>
<th>Water security variables</th>
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</thead>
<tbody>
<tr>
<td>TV1 Intellectual property</td>
<td>WSV1 Water in general</td>
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<td>TV2 Sanitary and phytosanitary measures</td>
<td>WSV2 Water resources management</td>
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<td>TV3 Technical obstacles/Labelling</td>
<td>WSV3 Wetland Management</td>
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<td>TV4 Public procurement</td>
<td>WSV4 Management of watercourses / basin development</td>
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<td>TV5 Investment</td>
<td>WSV5 Impact of agriculture on water / sustainable agriculture practices</td>
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<td>TV6 Agriculture</td>
<td>WSV6 Desertification</td>
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<td>TV7 Fishing</td>
<td>WSV7 Waste management (in general)</td>
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<td>TV8 Livestock</td>
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<td>TV9 Mining</td>
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<td>TV10 Technology</td>
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<td>TV12 Textiles</td>
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<td>TV13 Chemicals</td>
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<td>TV14 Industry</td>
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<td>TV15 Subsidy</td>
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<td>TV16 Countervailing measures</td>
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<td>TV17 Anti-dumping measures</td>
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<td>TV18 Safeguards</td>
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<td>TV19 Labor</td>
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<td>TV20 Cooperation in general</td>
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<td>TV21 General education</td>
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<td>TV22 Regional integration</td>
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<td>TV23 Transparency</td>
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</tbody>
</table>

Source: Carvalho (2015: pp. 34-35)
6 Results

6.1. Free trade agreements

Source: WTO (2013: p. 61)
Figure 1: Free Trade Agreements in the GATT System (1949 - 2012)
6 Results

6.2. Evolution of the disputes in the arbitral courts of investment

Source: UNCTAD (2013: p.2)
Figure 2: Evolution of disputes in the arbitral courts of investment
6 Results

6.3. Associations between water and trade in FTAs

[Table showing associations between water security variables and trade variables]

Source: Carvalho (2015: p.330)
Table 2: TCP - trade versus water (Fisher’s Exact Test)
7 Discussions

The environmental debate and trade regionalization.

Social-environmental framework and disputes.

The Investor-State Dispute Settlement System.

The International Center for Settlement of Investment Disputes (ICSID)

Water sector - Tanzania, Bolivia and Argentina

WTO Dispute Settlement Body (DSB) and environment issues
7 Discussions

Water security in FTAs: waste management (64 agreements); water resource management (34 agreements); agricultural impact on water and sustainable agriculture practices (32 agreements); desertification (17 agreements). 34 agreements considering water in general were identified, without citing sustainability guidance (Carvalho, 2015: p.330).

Some statistical associations between variables in those treaties were found:
7 Discussions

i. The variables "agriculture", "energy", "chemicals", "industry" and "public procurement" have a statistical link with the variables "water", "water resources management", "sustainable agriculture" and "waste management", expressing the nexus between water, food and energy security;

ii. FTAs that have investment clauses are not associated with any concern with water security. However, FTAs dealing with these clauses are linked to the water issue in general (perhaps in supply services). This strengthens the concern about environment, investment and the Investor-State Dispute Settlement System within the mega-agreements.
7 Discussions

The fruit sector in the Salitre River region

This region covers the Petrolina-Juazeiro Pole, which is made up of approximately 20,000 hectares of irrigated areas (Rossi, 2015).

This zone produces mango and grapes, whose main buyers are chains of the United States and the European Union. It was exported 156,337 tons of mango and 34,384 tons of grapes in 2015, respectively, accounting for 99% and 84% of Brazilian exports.

Considering virtual water exportation in 2015, it is estimated that the region sold about 230,000,000 m³ (1470 m³/ton) in mango production and 14,200,000 m³ (414 m³/ton) in grape cultivation, according to the parameters of Mekonnen and Hoekstra (2011)
7 Discussions
7 Discussions
Campos dos Cavalos - currently, nine outbreaks concerning social and environmental conflicts have been recorded in this zone, all of them involving the scarcity of water.

Certain communities, some of which are even involved in fruit agro-production, have organized themselves into occupation campaigns known as the "Landless Movement", focusing closely on the lack of access to water (Rossi, 2015).
8 Conclusions

The chains have exacerbated social and environmental problems in different producing regions, such as the Salitre River Basin in Brazil. In other places of South America this matter has also accelerated the process of desertification (Schwarz, Schuster, Annaert, Maertens & Mathijs, 2016).

The non implementation of the TTIP and TTP reduces the risks represented by the investor state dispute settlement mechanisms.

The rule of the US.
References


References


References


References


THANK YOU

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