

XI WORKSHOP INTERNACIONAL BRASIL/ JAPÃO ENERGIA, BIOCOMBUSTÍVEIS E DESENVOLVIMENTO SUSTENTÁVEL



Instituto Federal de Educação, Ciência e
Tecnologia de São Paulo

IFSP Campus Caraguatatuba – São Paulo

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*Prof. Dr. Antonio Carlos Zuffo
Departamento de Recursos Hídricos - DRH
Faculdade de Engenharia Civil, Arquitetura e Urbanismo - FEC
Universidade Estadual de Campinas - UNICAMP*



Basic Concepts

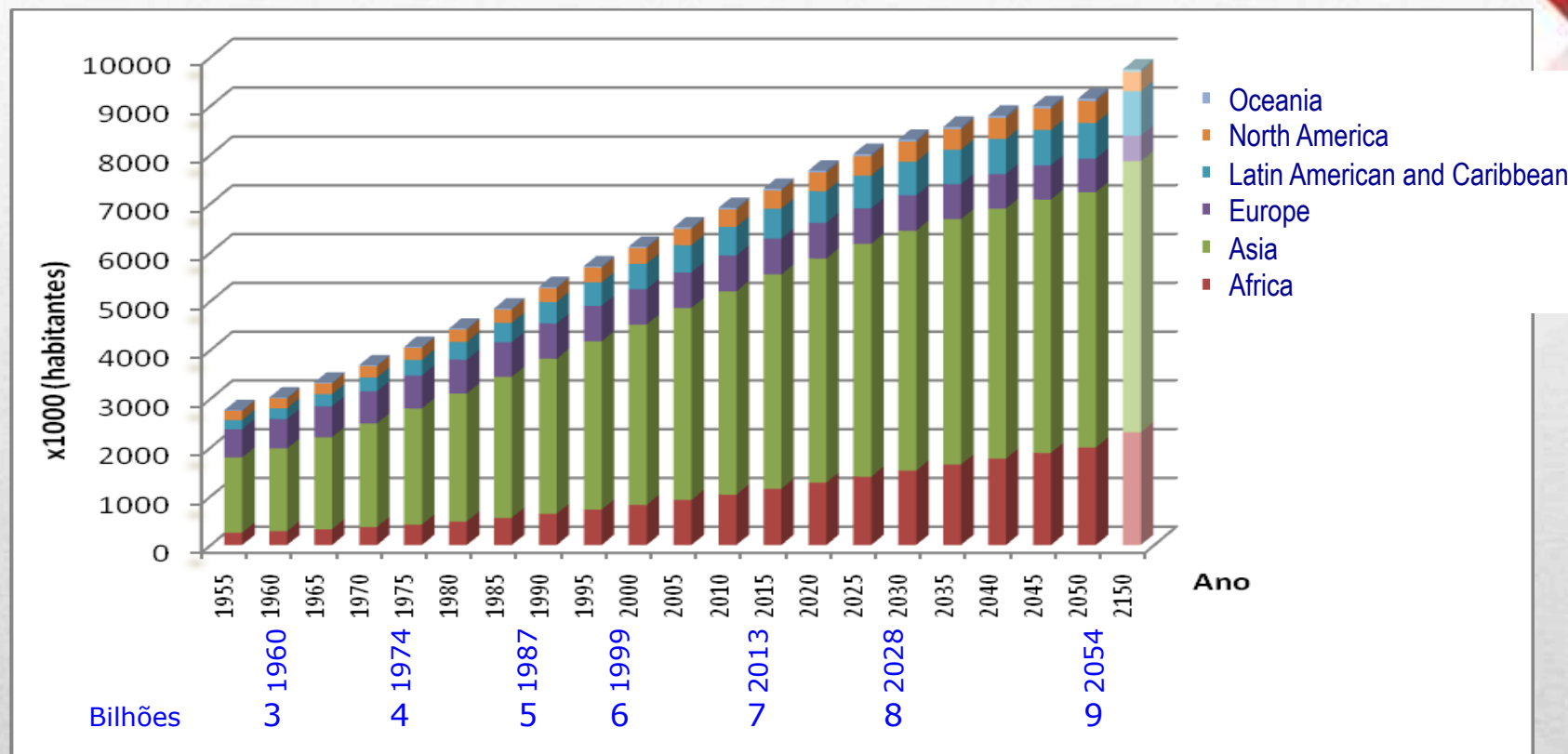
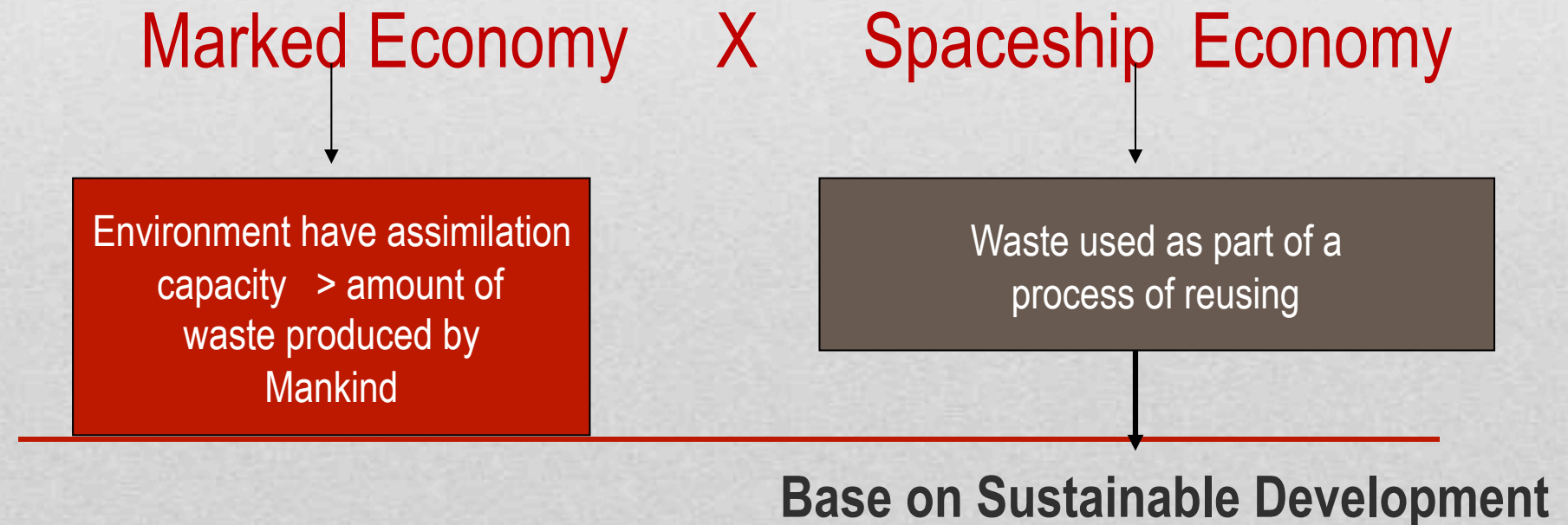


Figure 1. Estimated global population growth by 2050.

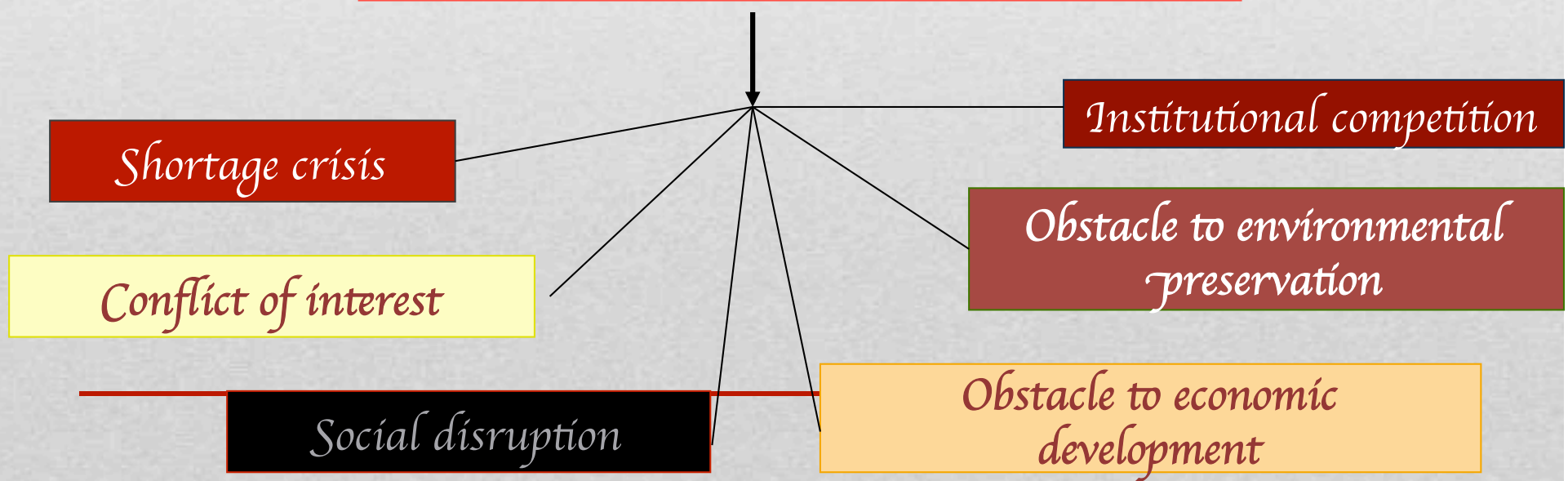
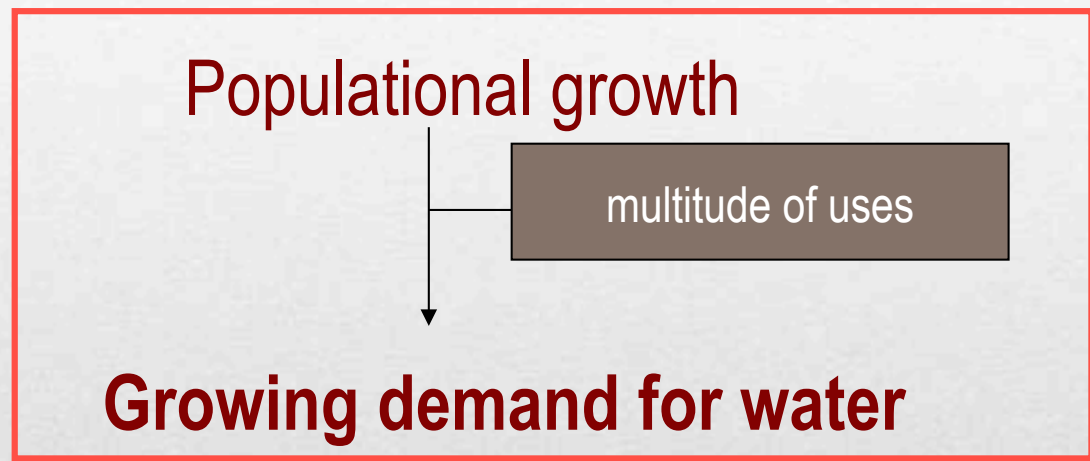
Basic Concepts

- The volumes of water consumed by mankind double every 20 years (Freitas, 2000).
- Important to maintain the balance between supply X demand. ?





Basic Concepts





Basic Concepts

Water functions		
Management	planning administration regulation	
Offer	Damming - reservoirs cistern wells	
use	Consumptive (when there are losses, Derivation or consumption)	Urban supply irrigation Aquaculture
	Non consumptive (do not decrease water quantities)	Hydroelectric generation IWT Recreation and fishing and fish farming Assimilation of sewage
Preservation	Natural resources	

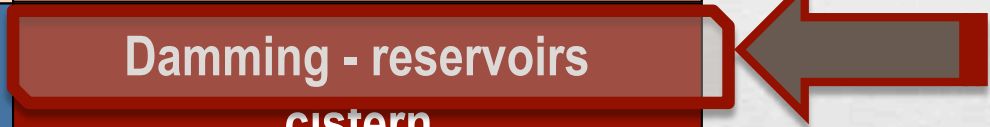
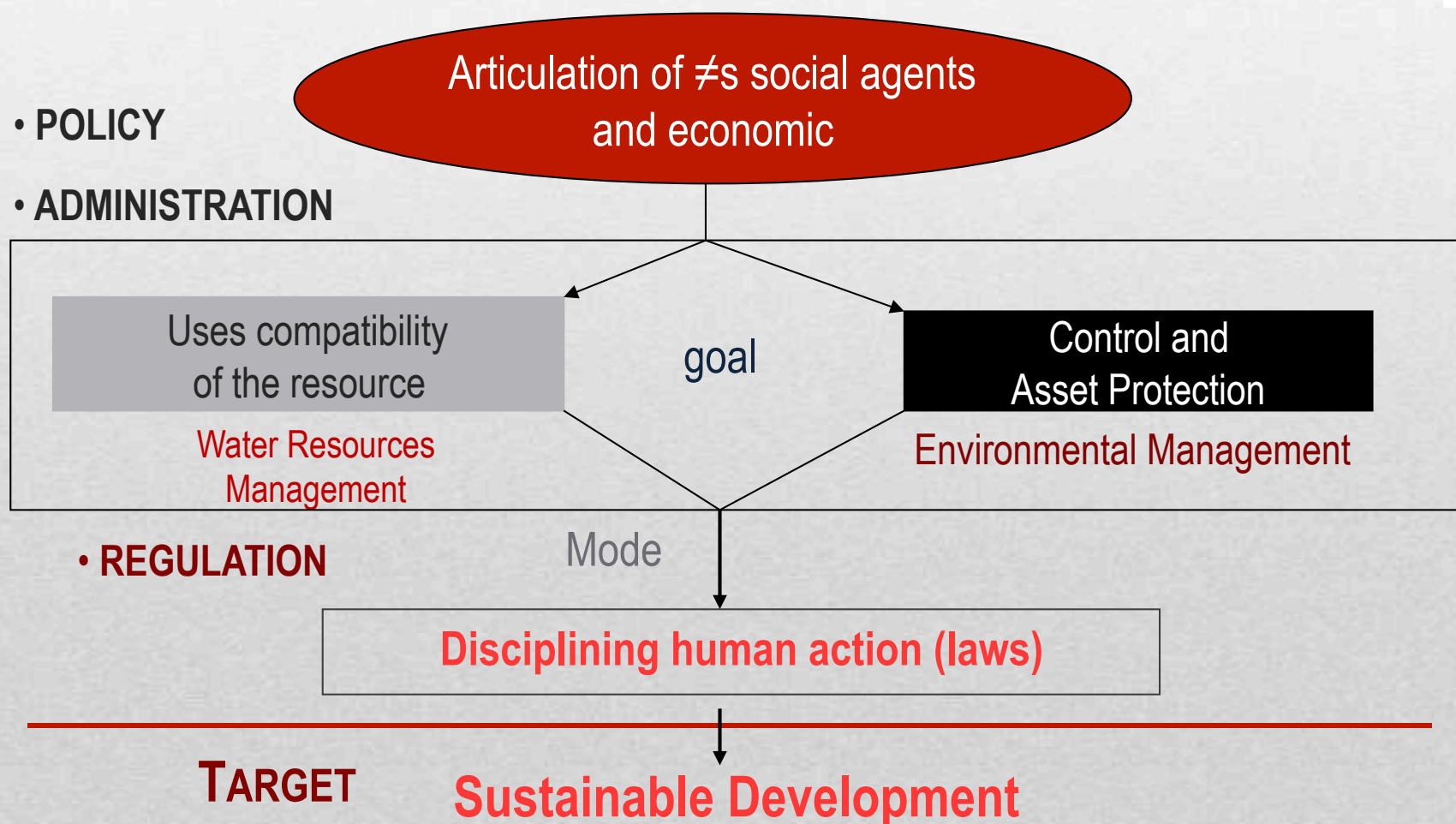


Figure 3. Functions of the water management system



What is Water Resources Management?



A Brief History of Water Resources Management



The law for the use of water resources was drafted by the jurist Alfredo Valladão, and forwarded to the Brazilian Congress in 1907;

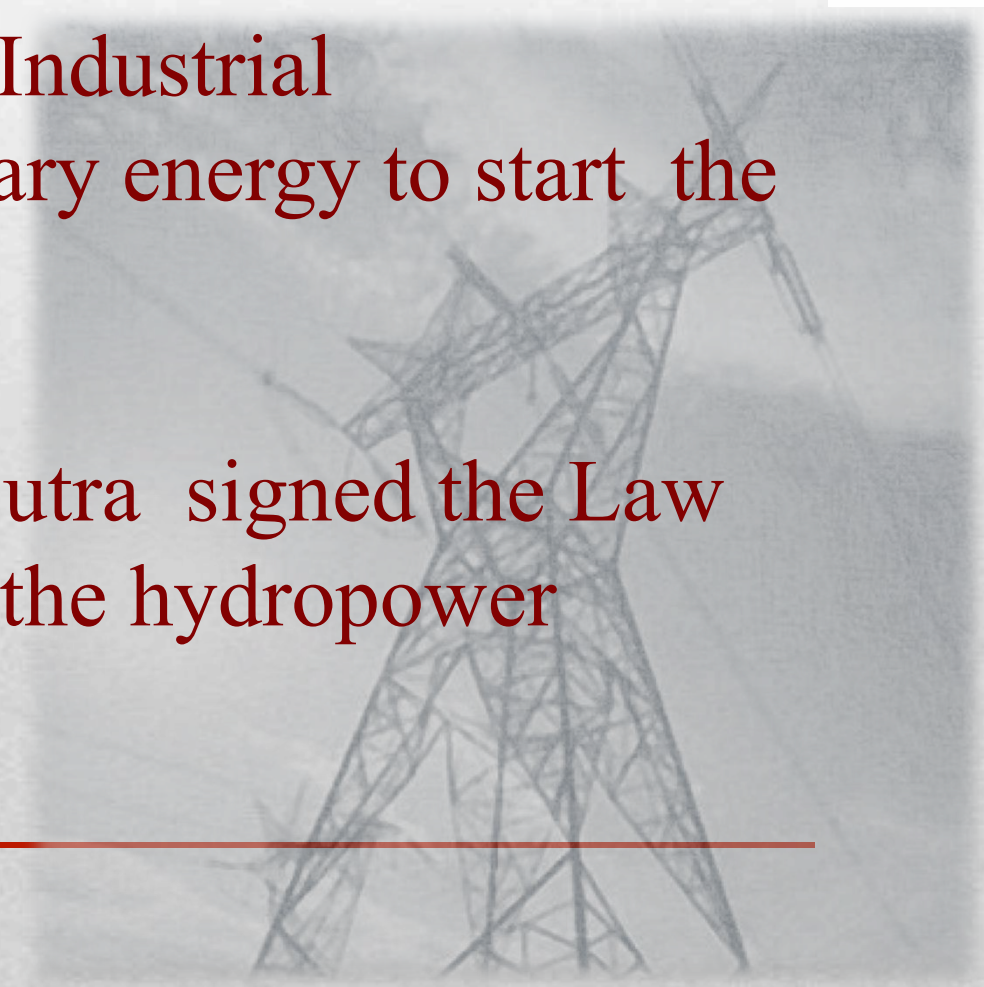
Underway it was just approved in 1934, by the Decree 24.643/1934, known as "Water Code".

Starts Bureaucratic Management in Brazil.

A Brief History of Water Resources Management

The Sao Paulo State → Industrial Development → necessary energy to start the early industrialization.

In 1946, the President Dutra signed the Law 22.008, use of water → the hydropower production was priority.



A Brief History of Water Resources Management

Starting from 1950's

- Brazilian Industrial Revolution;
 - Migration countryside → city;
 - Disorganized Urban growth;
 - Lack of urban infrastructure;
 - Great technological advances to mankind;
 - Consequences....
-



A Brief History of Water Resources Management



The 1960's

It was approved Brazilian Forest Code, Law 4.771, September, 15th of 1965.

A Brief History of Water Resources Management

Law # 4.771, september 15th of **1965**

Law # 7.803 of july 18th of **1989** (modify)

Alongside rivers or any water course from its highest level in marginal band whose minimum width is:

- 1) thirty (30) feet to the water courses of less than ten (10) feet wide;
- 2) fifty (50) meters for watercourses that have ten (10) to fifty (50) feet wide;

Was it respected by Municipalities ????



Environmental Degradation



In Brazil, There **WAS NOT ENVIRONMENTAL** Regulation until the mid-1980's.

Popular mobilization against the pollution of the rivers Piracicaba, Jundiai, Capivari and Tiete.

Creation of Watershed Inter municipal Consortium PCJ.

Creation in 1982 of **CONAMA**.





Environmental Degradation

Lack of Environment Regulation → Financial Economic Model (similar to TVA) → Environmental degradation.

Responsible → Ignorance

Decision Make Centralized



Example:

Absence of Environmental laws or very permissive laws;

Consequence:

Affect Water Availability (**QUALITY**)

Risk of shortages - HIGH TREATMENT COSTS

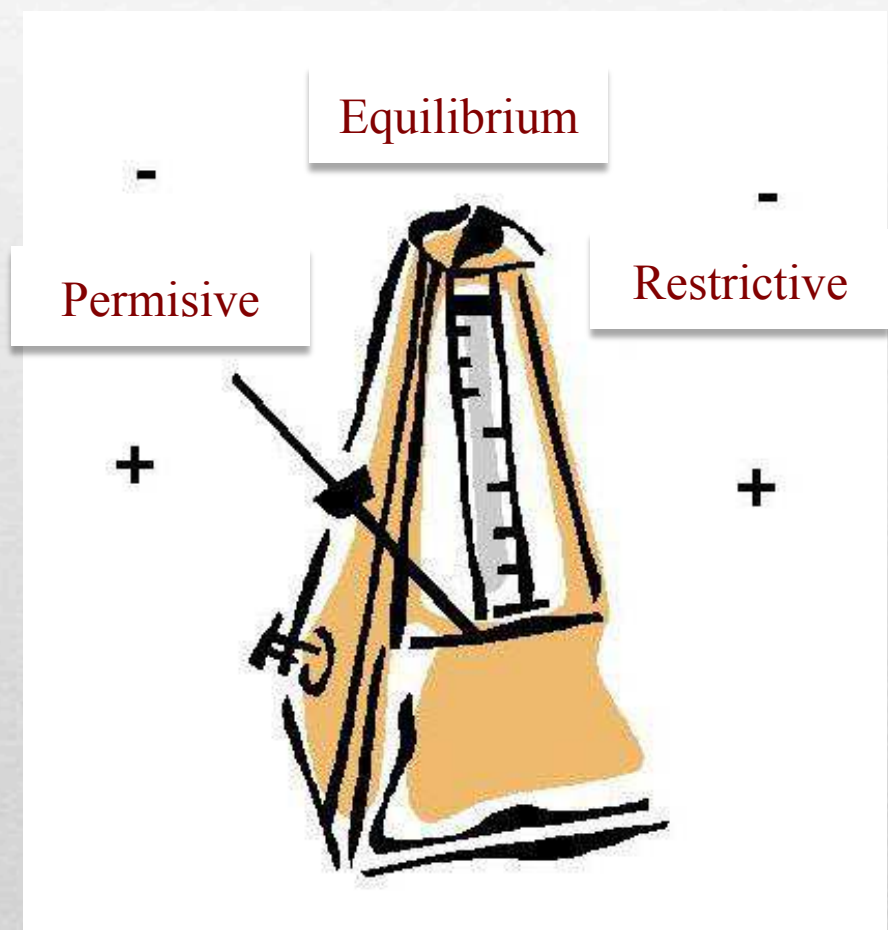


ABSENCE OF ENVIRONMENTAL LAWS OR PERMISSIVE ONES;





Lack of Regulation:



Lack of environmental regulation = degradation, (Erosion, air and water pollution, life quality losses, extinction of species, ...)

➔ Moving to opposite side = excessive restriction

Excessive Regulation:



Moving to opposite pole =
Excessive restriction → no
feasible development →
economic unsustainability →
the Laws disobey;

The opposite movement →
Relaxing or easing
restriction (changing
laws)



Example:

Disobedience to the forest code (1965).



APP

Example:

Environmental laws more restrictive;

Difficulty in building large reservoirs for
regulating flow

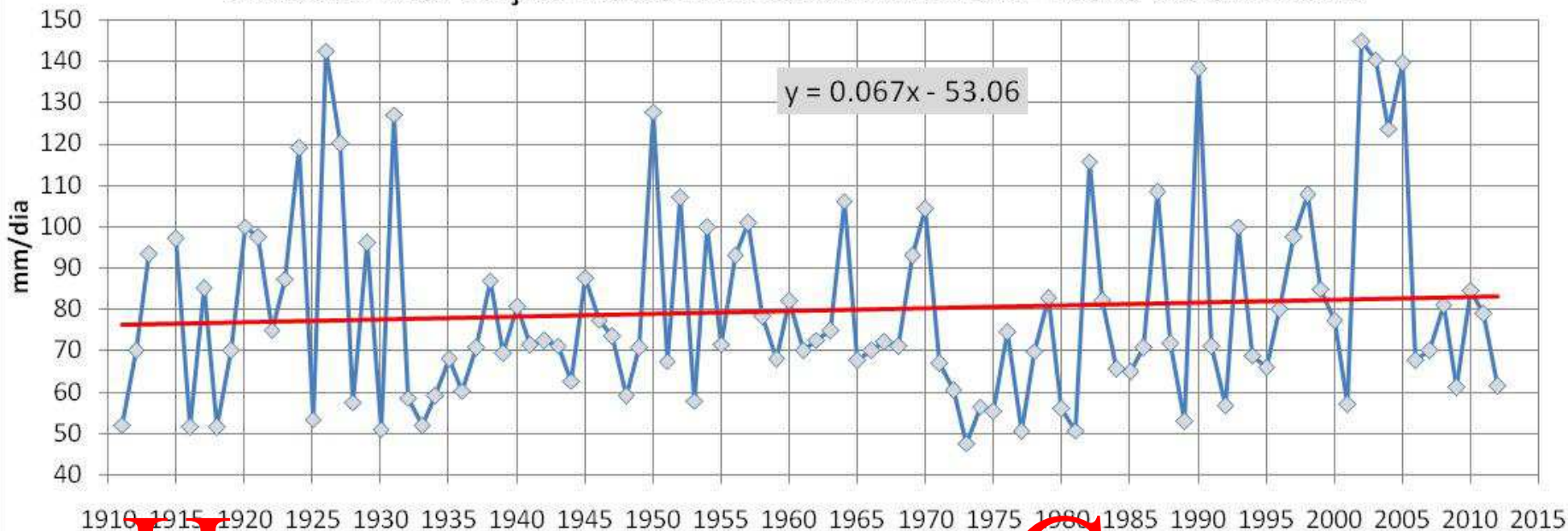
Consequence:

Affects water availability (quantity)

risk of shortages

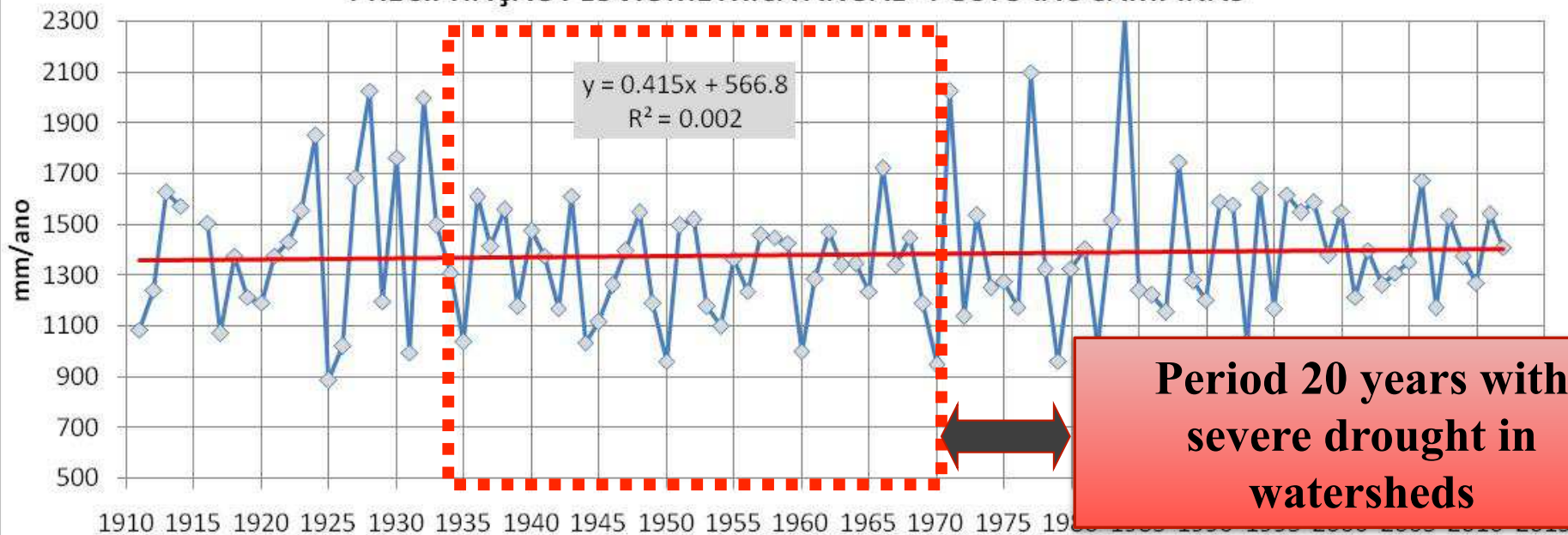


MÁXIMA PRECIPITAÇÃO PLUVIOMÉTRICA DIÁRIA ANUAL - POSTO IAC CAMPINAS



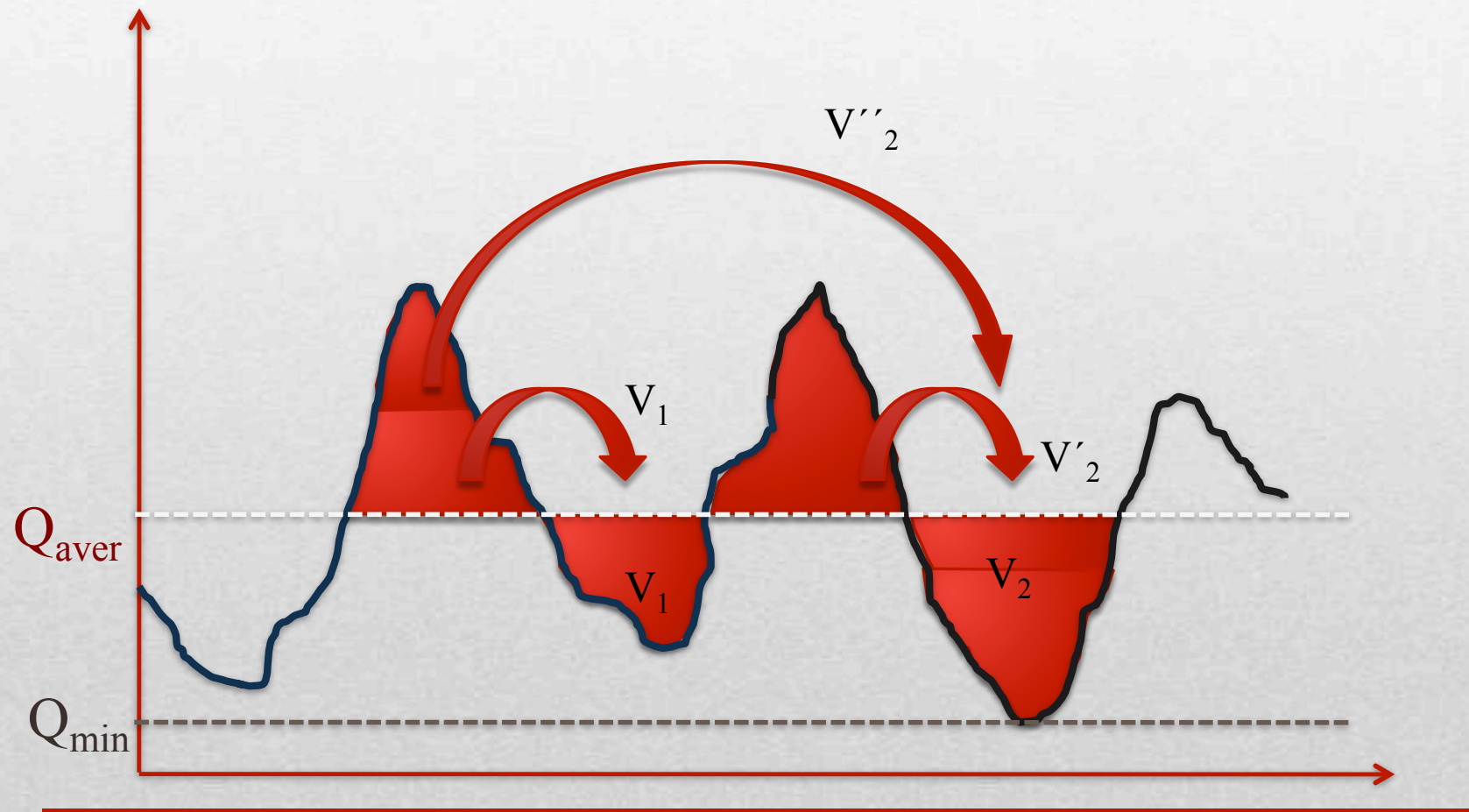
HYDROLOGIC CYCLE

PRECIPITAÇÃO PLUVIOMÉTRICA ANUAL - POSTO IAC CAMPINAS



**Period 20 years with
severe drought in
watersheds**

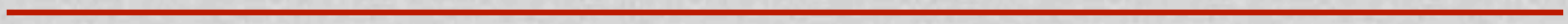
Regularization of Flows





Cause (s):

- Economical non-sustainability
- and/or
- Social non-sustainability (Social Unfair).



What is the risk that we
are subject to water
shortages??





Thank you Very Much



e-mail: zuffo@fec.unicamp.br
