



Presentation from
**2015 World Water
Week in Stockholm**

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“Emerging Pollutants in Water and Wastewater: UNESCO-Sida Project Case-Studies”



Case-Study from Latin America: Mexico - Maya Area

Organochlorine pesticides, impact in the water, blood of Maya women with uterine cervix cancer, and breast milk -human biomarkers-, trends in public health in Yucatan, Mexico

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OBJECTIVES



Main Objective

- Assessment the contamination levels of organochlorine pesticides (OCP) in the karstic aquifer, in the blood of Maya women with cervix uterine cancer, and in breast milk. Evaluation the risk perceptions of communities in the management of agrochemicals.

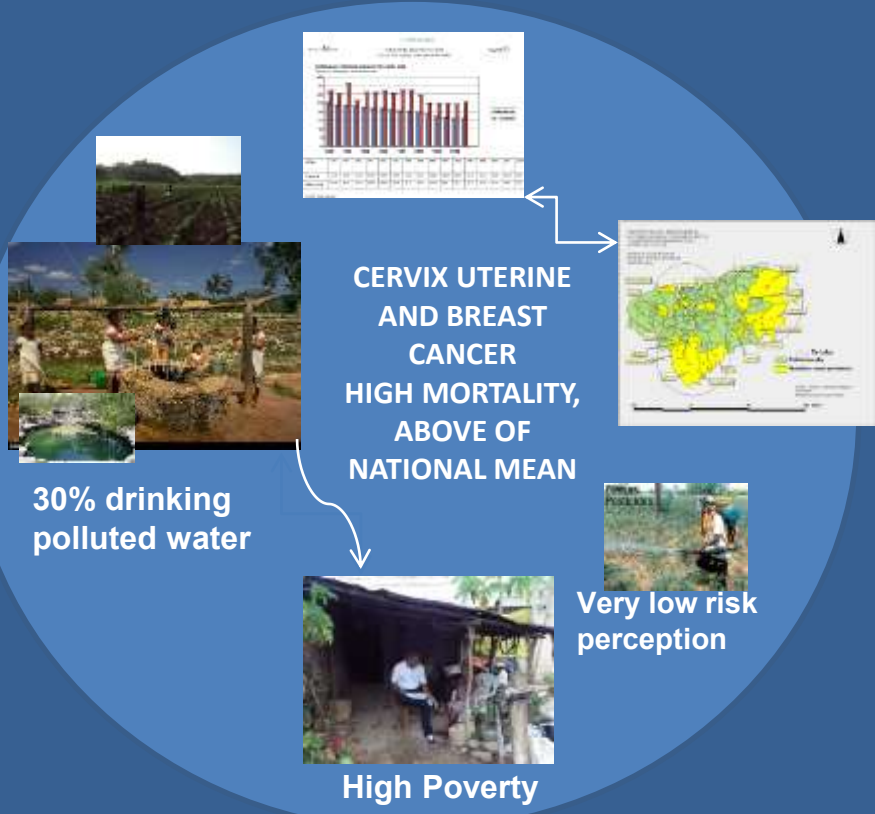
Specific Objectives

- Assessment the levels of OCP in water
- Assessment the levels of OCP in blood of Maya women with cervix uterine cancer
- Assessment the levels of OCP in breast milk
- Assessment the risk perception of the communities on the use of agrochemicals
- Analyze the spatial distribution of pesticides

Organochlorine Pesticides: Are persistent pollutants in the environment, can bioaccumulate in the human body. Are endocrine disruptors related with neurotoxicity, genotoxicity, carcinogenicity process

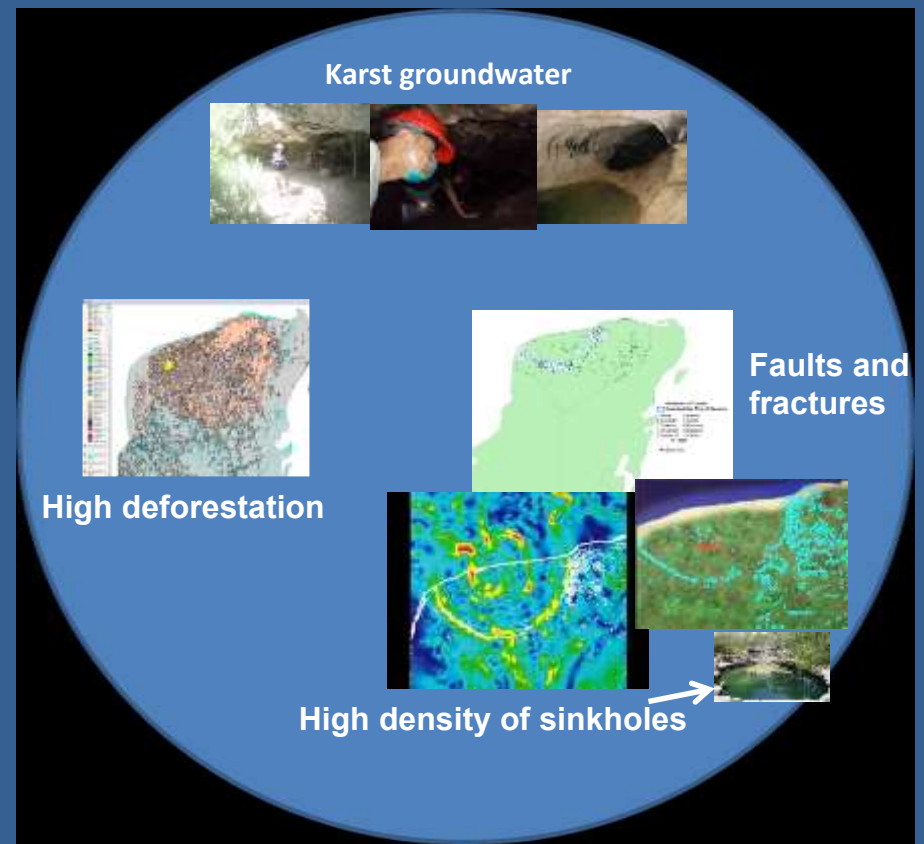
POLLUTION SCENERY

SOCIAL VULNERABILITIES



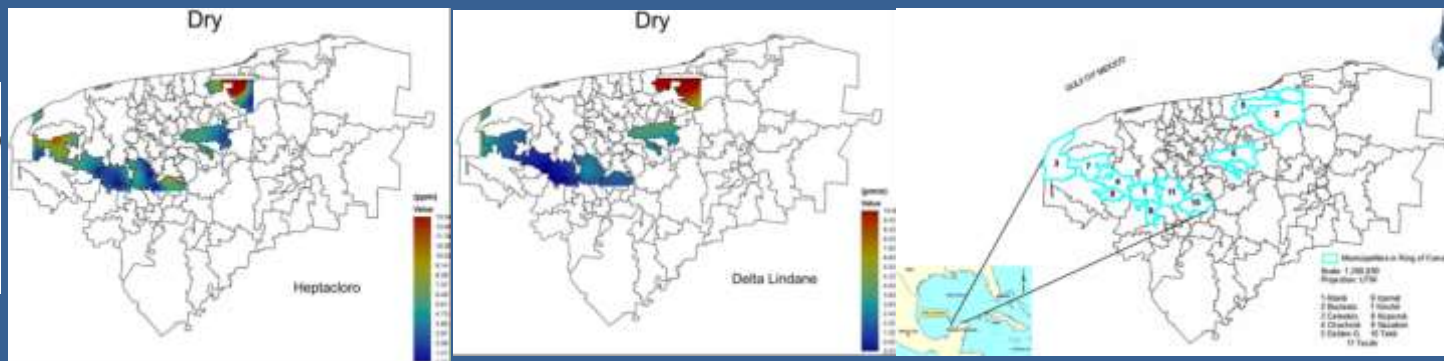
| Education | |
|----------------------------|-----|
| Illiterate population | 45% |
| Incomplete basic education | 55% |
| Speaks Maya and Spanish | 67% |
| Speaks Spanish | 33% |

NATURAL VULNERABILITIES



PRELIMINARY RESULTS

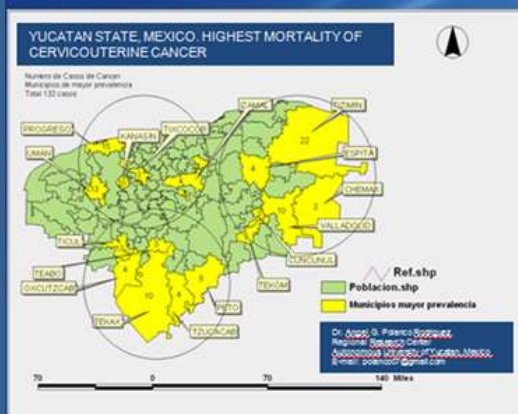
PESTICIDES IN WATER:



Heptachlor: 13.6 ppm; 10.86 ppm Delta-Lindane in the livestock area

PESTICIDES IN BLOOD OF WOMEN WITH CERVIX UTERINE CANCER :

STUDY OF BIOMARKERS IN BLOOD OF WOMEN WITH CERVICOUTERINE CANCER, YUCATAN, MEXICO. MAYA COMMUNITIES



BLOOD

N= 132

Sample = 70

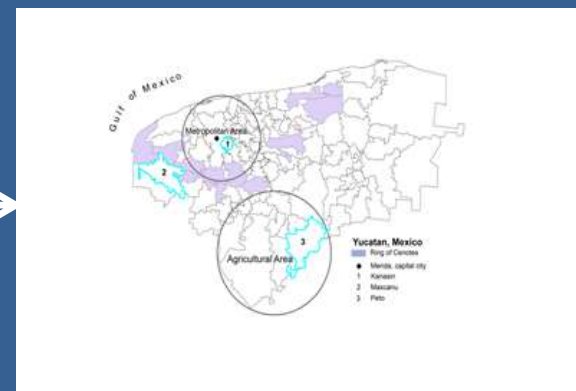
72% OF DETECTION
53% ABOVE OF LMR

BREAST MILK

N= 32

Sample = 32

100% OF DETECTION
98% ABOVE OF LMR



18.43 ppm of heptachlore epoxide,
1.92 ppm of endrin, metropolitan zone
2.10 ppm of dieldrin in agricultural zone

3.69 ppm of aldrin and endosulfan 7.35 ppm in livestock area
1.26 ppm of 4,4' DDE, 1.19 of dieldrin in agricultural area



Contamination by organochlorine pesticides in the aquifer of the Ring of Cenotes in Yucatán, México

A. G. Polanco Rodríguez¹, J. A. Navarro Alberto², J. Solorio Sánchez², G. J. Mena Rejón³, J. Marrufo Gómez³ & T. A. Del Valls Casillas⁴



Human and Ecological Risk Assessment: An International Journal

Volume 21, Issue 7, 2015

Risk Perception and Chronic Exposure to Organochlorine Pesticides in Maya Communities of Mexico

Angel G. Polanco Rodríguez, M. Inmaculada Riba Lopez, Casillas T Angel DelValls, Patrizia Quattrocchi, Fernando J. Alvarez Cervera, Francisco J Solorio Sánchez & Albertos Jorge A. Navarro (2015)

Journal of Exposure Science & Environmental Epidemiology

Monitoring of organochlorine pesticides in blood of Maya women with uterine cervix cancer from Yucatan, Mexico

Ángel G. Polanco-Rodríguez^{1*}, M. Inmaculada Riba López², T. Ángel DelValls Casillas², J. Alfredo Araujo León³, Durey V. Ruiz Ciau³

**Earth
Sciences
Research
Journal**



Impact of Pesticides in the Karst Aquifer, Recent Trends in the South of Mexico

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NEEDS TO CONTINUE THE RESEARCH STUDIES



- **Stablish a Water Monitoring Program**
- **Stablish a Blood and Breast Milk Monitoring Program**
- **Health Promotion Participatory Research Workshops to the Women**
- **Agroecolgical Workshop for Agriculture**
- **Spatial analysis of distribution of OCP in Water-Blood-Breast Milk**

Many Thanks

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