Danish experiences with research on the health impact of pesticides in Bolivia, Uganda and Nepal

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Serious global situation on pesticide poisonings

Pesticides poisonings at global level

- 3-400,000 deaths of acute pesticide poisoning/year,
- 3-4,000,000 severe cases of acute pesticide poisoning/year,

Occupational poisonings among farmers

- Estimated WHO 20-25,000,000/year
- Self-reported poisonings are frequent varying from 6.4% to 93% depending on criteria for classification like per year/month/lifetime/one or more symptoms/blood tests
- Affected blood levels of AChE enzyme seen among organophosphate exposed farmers
Acute and Chronic health effects

Acute symptoms:
Headache, vomiting, sweating, dizziness, respiratory failure, skin itching, dead

Chronic symptoms:
Cancer, skin, eye, lung, fertility, neurological damage, psychiatric disorders
Pesticide use is increasing!

(kg active ingredient/ha cropland, FAO-stat)
Development projects

- NGO donors: Danida, CISU, EU, other funds
- Applicant NGO Dialogos
- Board, >50 members, general assembly, accountability
- www.cisu.dk
Local Partners

- Same requirements as for the danish NGO
- Selected from trach record, friends recommendation, often start with small activities
Timeline

- 2001-2019 PLAGBOL Bolivia
- 2010-2017 UNACOH Uganda
- 2013-2016 NPHF Nepal

- Farmers
- Health care workers
- Schools
- Universities
- Ministries
- NGOs
- Private business
Prevention of occupational pesticide poisoning by Integrated Pest Management (IPM)

IPM is a strategy promoted by FAO and others to fight pests and pest resistance by

- Minimizing pesticide use
- Using less toxic pesticides
- Using organic alternatives
- Promoting good agricultural practices (including scouting)
- Safe working procedures when handling pesticides.
c) ¿Cuáles son las desventajas de los plaguicidas?

Su control es temporal y nos volvemos dependientes de los plaguicidas. Elimina de caño a los insectos malos y buenos. La mala aplicación de los plaguicidas crea resistencia en los malos. Cuesta más caro, contamine el suelo, provoca envenenamiento en nuestras clasificaciones de plaguicidas.

- La plagas que controla
  - Insecticidas, acaricidas, fungicidas

Por su estructura química
- Organoclorados, organofosforados, carbamato pentrioides
- Por su grado de toxicidad
  - Extremadamente tóxico
  - Altamente tóxico
  - Moderadamente tóxico
  - Ligeramente tóxico
  - Precaución

Por la forma de actuar
- Herbicidas pueden
  - Prensa siembras
  - Reemergencia
  - Reemergencia
Development projects results

- Skilled manpower on Integrated Pest Management formed
- Teaching and information materials on IPM
- Change in curriculums
- IPM adopted in politics
- Students trained
- New knowledge created
- Pesticide industry decreased influence
- Some toxic pesticides banned
Research in Development Projects

Overall objective
”Decrease the negative impact of pesticide use on human health and the environment!”

Awareness rising
Advocacy for a change
Research focus

- Reasons for acute pesticide poisonings
- Prevention on acute pesticide poisonings
- Genetic changes
- Children’s neurodevelopment
- Gender issues
- Food residues
- Suicide with pesticides
Research results

- Knowledge for advocacy locally, nationally and globally created
- Baseline and end-line studies for planning and evaluation
- > 75 students trained locally and globally during last 10 years (bachelor-, master-, phd-thesis)
- Basis for start up teaching on Global Occupational Medicine in Danish Universities
- Published >20 peer reviewed articles (see pubmed)
Acute pesticide poisoning among Bolivian small-holder farmers: frequency, risk factors and prevention!
### Timeline research Plagbol 2001-16

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<th>Phase 1 2001-2004</th>
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#### Phase 1 2001-2004
- Training of farmers in La Paz Department

#### Phase 2 2005-2010
- Advocacy and training at country level

#### Phase 3 2010-2013
- Consolidation and phasing out

### Key Events

- **Baseline survey 2002**
- **Follow up 2004**
- **Follow up 2009**
- **Follow up 2009**
- **Obstacles to IPM 2013**
- **Survey on farmers and retailers**
- **Genetic changes**
- **Children neurodev**
- **Food safety**
- **Neuro damage**
- **Diabetes**
- **Residues vegetables**
- **Garbage**

### Topics

- Genetic changes
- Children neurodev
- Survey on farmers and retailers
- Food safety
- Neuro damage
- Diabetes
- Residues vegetables
- Garbage

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**Figure 1: Flowchart of research timeline and key events**

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**Figure 2: Diagram of research phases and outcomes**
Follow up on IPM IPM intervention 2002-04-09
KAP-score = aggregated variable of 27 KAP variables
Cross-sectional study on KAP-score between trained, neighboring and a group of control farmers 2009
Challenges for research

- Manpower
- Funds
- Culture
Thank you

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5. Reiler E, Jørs E, Bælum J, Huici O, Cairo MMA, Cedergreen N: The influence of tomato processing on residues of organochlorine and organophosphate insecticides and their associated dietary risk. STOTEN - D-15-00203R1


