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Highly Hazardous Pesticides (HHP) in EU compared to developing countries, case study: HHP history and use in Iran

SESSION 2: TOXICOLOGY: CHEMICAL EXPOSURE OF WILDLIFE AND HUMANS (BLOCK 14)
CHAIRS: DANIELA LUD & STEPHAN ROBINSON (15MIN /SPEAKER)

AHMAD MAHDAVI

Introduction/ overview

- My work: Pesticides Reductions and Regulations for Developing countries (51 years since 1972)
- Pesticide Related Problems;
- Highly Hazardous Pesticides (HHP);
- Highly Hazardous Pesticides (HHP): our discussions under SAICM since workshop in Cambridge: Sept 2019;
- Highly Hazardous Pesticides (HHP) in EU;
- Highly Hazardous Pesticides (HHP) in Developing countries, case study: IRAN;
- Preventing wildlife poisoning: Effects of HHP on wildlife, honey bees and pollinators;
- Resulting, Conclusions and Recommendations.

My work: Pesticides (51 years since 1972) Introduction/Background/Objective/ Methodology

- My Objectives: **Pesticide/ chemical pollution reductions & regulations in developing countries (trying to concentrate on the MENA);**
- Methods: **A wide study since 25 years ago for Iran/ Dev. Count. Covering NGOs, SAICM, FAO, WHO, EPA, OECD, PMRA, ECHA- REACH, PAN, DPR, ...**

University of TEHRAN

Pesticide Related Problems

- **Health effects** of pesticides for people/ Children/ Pregnant/ Field workers;
- Bioaccumulation/ Biomagnification/ **Destroying biodiversity/ Speciation**;
- **Honey bees *Apis mellifera*** is getting extinct because of HHP particularly NEONICS, still pesticide companies keep growing, **Honey Bees** are disappearing fast (CCD);
- Wildlife and pollinators poisoning with HHP.





Mixing pesticides with a bare hand!!??

Stockpiles of Obsolete pesticides in Developing Countries: Obsolete pesticides are very dangerous, just like atomic waste (Nov. 2010, FAO workshop in Turkey)

Death scenarios with HHP Globally:

Moving toxic industries to Developing Countries, Bhopal 1984, Peru and Bihar...and it is continuing

- **Bhopal** pesticide disaster 1984
- 25 Children killed in **Peru,** 23 children killed in **Bihar, India** eating pesticide polluted food;
- **IRAN:** Every year there are more than 650 people killed in Iran only with **rice tablet: phosphine,** A few years ago: only in Kerman, Iran 55 deaths with **Paraquat.**
- **Agrochemicals Market to 2018 (worth $242.8 Billion** with fivefold growth rate) by Fertilizer (Nitrogenous, Potassic, Phosphatic) by Pesticide (Organophosphates, Pyrethroids, Bio-Pesticides)

Highly Hazardous Pesticides (HHP)- FAO/WHO

- The FAO/WHO International Code of Conduct on Pesticide Management defines Highly Hazardous Pesticides (HHPs) as:
- Pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions.
- In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous.

Highly Hazardous Pesticides (HHP)

- High levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or Global Harmonized System (GHS) or their listing in relevant binding international …
- Acute toxicity makes it possible to classify pesticides into five classes: **class I - highly toxic, class II - toxic, class III - moderately toxic, class IV - slightly toxic, class V - virtually non-toxic**.

Highly Hazardous Pesticides (HHP)

- Highly Hazardous Pesticides (HHP): our discussions under SAICM since workshop in Cambridge: Sept 2019;
- HHPs are a matter of public health, occupational health and environmental health concerns
- According to UNEP report: In 2015, SAICM Fourth International Conference of Chemicals Management (ICCM4) adopted a resolution that recognizes HHPs as an issue of international concern and calls for concerted action to address HHPs.

FAO and WHO, IPEN, different sections of PAN, US EPA, EU ECHA

- Other than SAICM many other globally related organization, civil society, NGOs, etc. are discussing about these dangerous pesticides:
- FAO and WHO, IPEN, different sections of PAN, US EPA, EU ECHA are just some of them.
- When we look on all these we can see that role of developing countries and their important relations to HHP are highly forgotten!
- For many times I myself proposed separate and wide discussions and actions from these global agencies for HHP in developing countries, where we are, where people suffering from HHP and where we as related scientists do not get our parts, budgets and always ignored.

Highly Hazardous Pesticides (HHP) in EU

- EU Bans Pesticides in Parks, Playgrounds, and Playing Fields; (Beyondpesticides, July 2022);
- Highly Hazardous Pesticides (HHPs) nearly banned in all EU countries are still found easily in some developing countries doing tremendous harm to people, environment and wildlife;
- ECHA & REACH in Helsinki, good Reg. (MENA!?);
- Best Reg.: 1- EU, 2- Australia, 3- Canada, 4- USA
- PMRA, CFIA, ECHA & REACH, OECD, EPA, DPR (Sacramento & Berkeley)/ other pesticide regulations;
- Big pesticide corporations just thinking about their own profits;

EU regulatory issues for rodenticides

- According to the ECHA GUIDANCE ON REGULATION (EU) No 528/2012 for biocides:
- If rodenticides (Biocide Product-type 14: Rodenticides) used outdoors in the form of baits, granulates or powder, a risk assessment for birds is necessary;
- **EU & ECHA: European Biocidal Products Forum (EBPF)** In 2002, EBPF established its Rodenticides Working Group for good practice initiatives across the rodenticides industry in Europe;
- Training and Certification Requirements for Rodenticides Used as Biocides in the EU.

HHP and Gender issues

- Because of sensitivity of the issue we always discussed “gender and chemicals” separately;
- Toxic chemicals including HHP linked to lower egg counts in women;
- Pregnant mothers under threat by HHP in developing countries;
- Female agricultural workers with baby on back working in paddy rice treated with HHP in Mazandaran;
- Mothers milk, breast feeding is the first right for any human being and there are many reports regarding exposure of mothers to HHP including POPs.

Highly Hazardous Pesticides (HHP) History and use in Iran

- My own exposure stories;
- HHP and worker protection in developing countries;
- Pesticide **Licensing and Certification** in developing countries;
- Globally wide committing suicides with HHP with reference to the situation in Iran: Rice tablet: aluminum phosphide;
- Pesticide mafia in Iran like many other developing countries.

Historic Death scenarios with HHP Ops in Iran

- Historically, Highly toxic POPs plus HHP Ops like parathion ,..etc. in cotton fields, other agricultural fields and citrus orchards of Mazandaran and Golestan Provinces. HHP like Parathion, Diazinon, Sevin, Paraquat;
- Highly toxic POPs plus HHP Ops like parathion ,..etc. in cotton fields, other agricultural fields and citrus orchards of Mazandaran and Golestan Provinces:

Preventing Intentional and Unintentional Deaths from Pesticide Poisoning (Good Clinical Toxicology group in Iran)

Health & Environmental Pollution with HHP Ops, POPs, etc., in Iran

- Diazinon, Iran Rice Paddies and Wetlands (RAMSAR);
- My talks for SWS, RAMSAR COP 13, etc. about loss of biodiversity in wetlands due to connection agricultural lands (Mahdavi, Ramsar Convention…SWS,…);
- **HISTORY OF HCH USE IN IRAN, IMPACT ON HEALTH, SAFETY AND ENVIRONMENT** (***This is a long, strong and dangerous history of HCH use in Iran, horrible story of POPs polluted soil in North east of Iran close to Turkmenistan);***
- I was there under exposure to all types of POPs sprayed by big spraying aircrafts mostly from Bulgaria and mainly on cotton field;
- Ships and ships of all types of dangerous POPs (4th exporter of cotton globally).

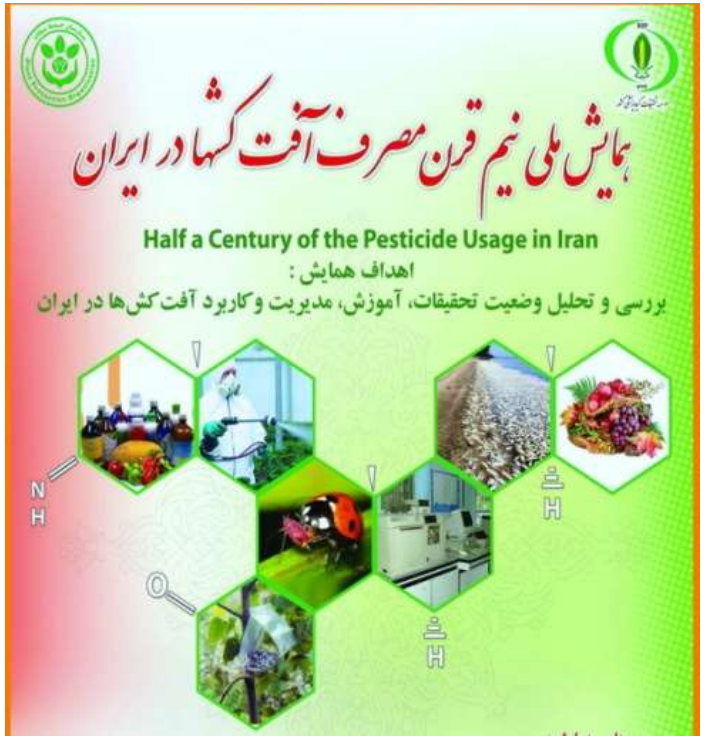
HISTORY OF HCH USE IN IRAN, IMPACT ON HEALTH, SAFETY AND ENVIRONMENT

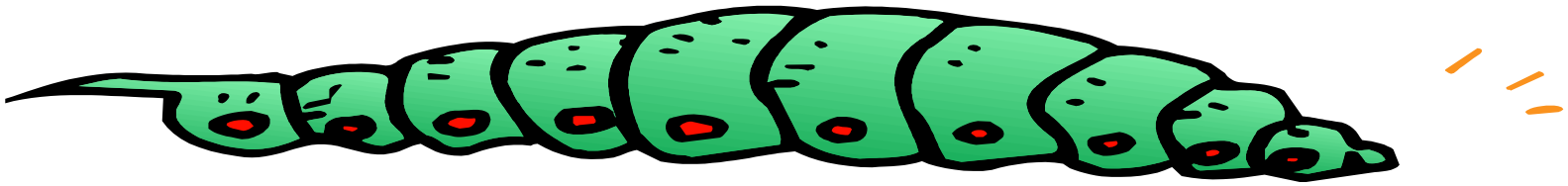
This is a long, strong and dangerous history of HCH use in Iran.

- Nearly all types of Chlorinated pesticides mixed with dangerous Ops like Parathion, the mixture was eg, Turbidan. DDT itself, Aldrin, Dieldrin (H.E.O.D), Heptachlor and on.
- Containers were everywhere, this was a big business for pesticide corporations that time.
- What left behind of that big sprayings are very polluted soils in Northeast of Iran near Turkmenistan, I mentioned the problem more than one time at the site of the World Soil Day.
- If we take the name HCH for the exact compound hexachlrocyclohaxan again there is a big history in Iran mostly under the name Lindane, still in use in Iran legally and illegally.

Pesticide Regulations in Developing Countries

Half Century of the Pesticide Usage in Iran





Sustainable Agriculture and Food systems in Developing Countries

Problems and management of Pesticides/ chemicals/ Genetically Modified in Developing Countries

For the “11th Asia Pacific Roundtable for Sustainable Consumption and Production, Bangkok, Thailand”

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Regulation of biocides in Middle Eastern countries case study: regulation of biocides in Iran

Biocide Asia, September 2015, Singapore

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CW+ BiocidesHub

ChemicalWatch
GLOBAL RISK & REGULATION NEWS

Pesticide Registration and Market Analysis

(Iran and Middle Eastern Countries)

Ahmad Mahdavi
University of Tehran

PhD, insect/ pesticides/ chemicals/ biocides environmental regulatory toxicologist

Member of the Iranian Society of Toxicology

Sept. 9-12, 2018,

CRAC 2018 REACH24H Consulting Group,

Shangri-La Hotel, Chengdu, China

Preventing wildlife poisoning:

case study from Iran and applicable international vs national regulatory issues

Ahmad Mahdavi, professor emeritus at University of Tehran,

PhD, insect/ pesticides/ chemicals/ biocides environmental regulatory toxicologist,

University of Tehran /and Sustainable agriculture and environment.

Second Meeting of the UNEP/CMS Preventing Poisoning Working Group

(PPWG2), Toledo, Spain, 19- 21 February 2017

Effects of HHP on wildlife, honey bees and pollinators

- HHP are known to be prominent drivers of pollinator decline with long term risk for pollinators,Now bits and pieces of pesticides/ chemicals and their metabolites….;
- A. Mahdavi, 2017, Toledo Spain, 2018 RAMSAR COP13, many other related references;
- A pesticide is designed to kill: Biodiversity & Wildlife? Environment?

Wildlife poisoning by insecticides

- History: Carbofuran; …….**Insects!??**
- My Guelph observation: birds dropping from sky (Mc Even & Stephenson: 1979, use and significance of pesticides in the environment, University of Guelph, Guelph, Ont., Canada);
- Carbamates: Aldicarb (LD50=2 mg/kg);
- Ops: diazinon (my work), Monocrotophos;
- Neonicotinoids: in Iran- in the World
- Fipronil a phenyl pyrazole broad-spectrum insecticide is highly toxic to many bird species;
- Also impacts on earthworms/ other bird feeds;
- DDT/ POPs: birds eggshell thickness?

Toxic pressure on wetlands

- POPs still in nature intoxicating all habitats and niches, their metabolites are worst;
- Big toxic threats to birds from Neonicotinoids;
- So less and less cohort development for birds is happening (eggshell thickness);
- Toxic threat to birds & fish were main motivations for Rachel Carson to start the whole story of environmentalism about 60 years ago.

Local risk hotspots of migratory birds poisoning by insecticides in IRAN

- Iran wetlands & Migratory birds;
- Connections to pesticide polluted agricultural fields/ paddy rice;
- Many risky hotspots for bird poisoning by pesticides
- My teaching/history in the University of Mazandaran!?/ before that 40-45 years ago now is called Golestan;
- Diazinon, etc. in rice paddy fields/ other agricultural fields;
- Living10 years there, observing, now FereydunKenar: Migratory birds slaughterhouse.

HHP High risk substances have been removed from the Iranian market!?

Pesticides?.....Acaricides & Nematicides?

Nematicide impact on wildlife

Removed/ suspended insecticides and acaricides from the Iranian market: what about nematicides?

- Diazinon- Pirimiphosmethyl- Teflobenzuron- Fuzalon- Thiaclopride- Thiomton- Fenthoat- Fention- Dicofol.
- Lindane- Monochrotophos- Phosphamidon- Endosulfan- Azinphosmethyl and Azinphosethyl- Carbaryl- Amitraz- Aldicarb- Emthoat- Propetamphos- Triazophos- Decrotophos- Chlorphenvinphos- Metidathion- Emtidathion- Foxim and Propoxur-
- Bendiocarb- Allethrin and bioallethrin- Bioresmethrin- Ciflothrin and beta-ciflotrin- Fenothrin- Lambda-cyhalothrin- Tetramethrin- Deethyl-toloamid-
- **Are they really removed!? Please see regulations in next slides.**

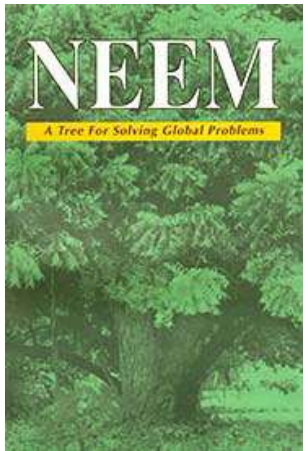
High risk substances that have been removed from the market!?:

- Many still in market/ used, no real control/ enforcement in Iran/ other developing countries; ME?
- More enforcement problem in ME due to involvement of governments in turmoil/ political problems/ fighting etc.;
- In Iran again & again talks about removal: years after they announced as removed: means they are still in market/ use;
- Some are only removed from using in agriculture but still in use in health sector/ veterinary;
- Laws and regulations of the "Organization of plant protection" of Iran belongs to some decades old history and no updating.

Have safe alternatives been found to traditional pesticides?

- **Neem tree, *Azadirachta indica* in the Persian Gulf: my work;**
- Nearly other 2000 pesticidal plants;
- Past successful biological control Gone by pressure of local pesticide companies/ world corporations (TNCs);
- IPM in Iran, my work, in World (controlling the pest below economic lines not the eradication idea).



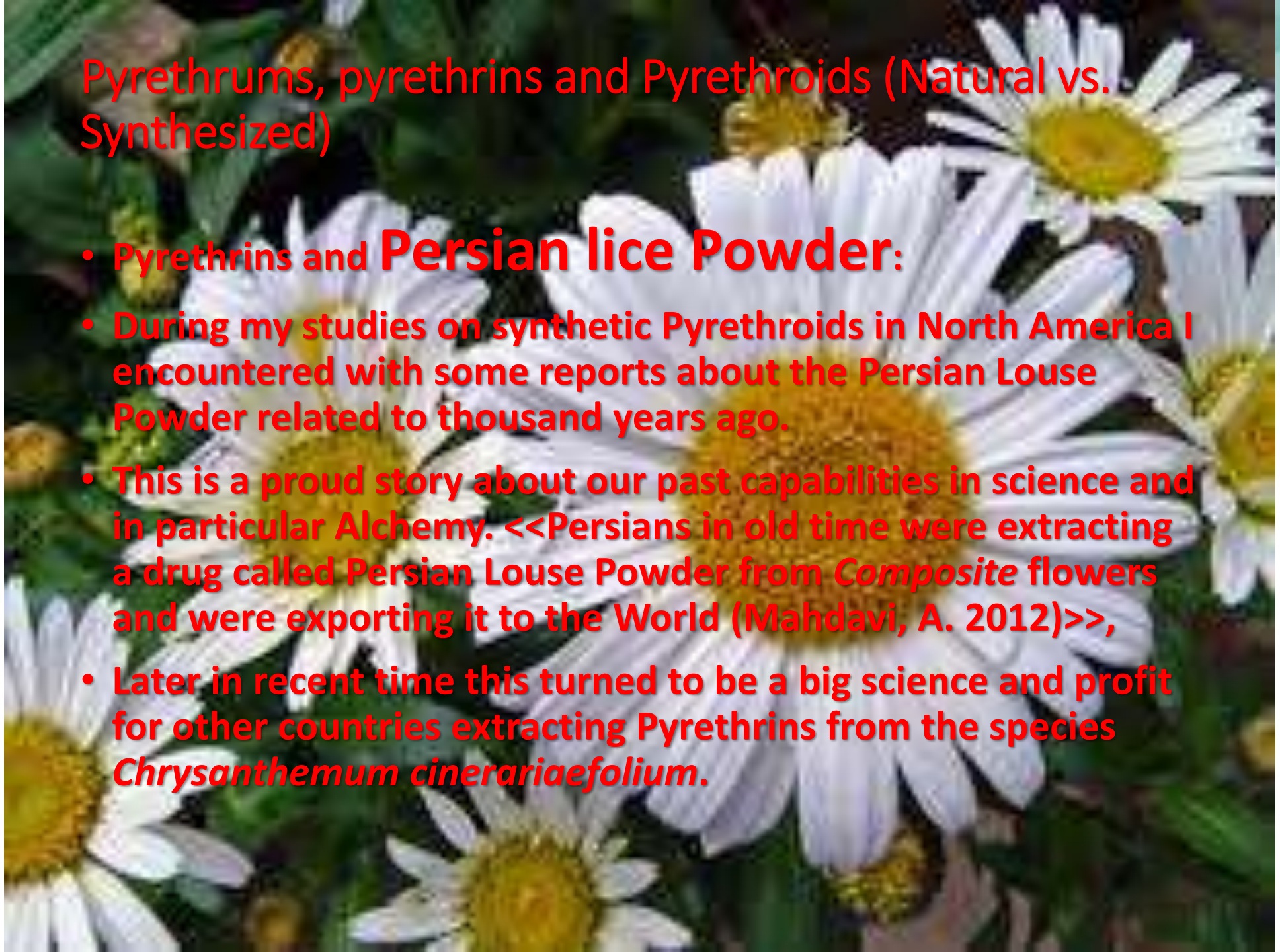




Pesticidal Plants: *Azadirachta indica* in the Persian Gulf Ports and Islands

- Pesticidal plants for IPM programs in developing countries;
- I introduced the neem tree, ***Azadirachta indica*** from the Persian Gulf area to the World 25 years ago;
- ***Azadirachtin*, Chitin Synthesis Inhibitors, etc., soft pesticides;**
- **Professor Steven Ley in Cambridge.**

Beautiful neem tree, *Azadirachta indica*, planted in Sirri Island in the Persian Gulf more than 15 years ago



Pyrethrums, pyrethrins and Pyrethroids (Natural vs. Synthesized)

- Pyrethrins and **Persian lice Powder**:
- During my studies on synthetic Pyrethroids in North America I encountered with some reports about the Persian Louse Powder related to thousand years ago.
- This is a proud story about our past capabilities in science and in particular Alchemy. <<Persians in old time were extracting a drug called Persian Louse Powder from *Composite* flowers and were exporting it to the World (Mahdavi, A. 2012)>>,
- Later in recent time this turned to be a big science and profit for other countries extracting Pyrethrins from the species *Chrysanthemum cinerariaefolium*.

Applicable regulatory issues, national vs international Iran

- Weak regulation, no enforcement due to wrong infrastructures: lots of human/ workers intoxications (our Iranian Soc.);
- Vice minister of health (Food & Drug)(No: 10): recently only %50 of pesticide under control by MoA/ other % 50 is smuggled into Iran;
- Mrs. Ebtekar, head of the Department of Environment (DoE) of Iran again talked (2016) about removing diazinon from Iranian markets!!! So they talk and talk but no enforcement.

Pesticides/ chemicals Regulations Stops at the Border!

Wildlife poisoning by rodenticides in Iran

- Second generation anticoagulant rodenticides (SGARs) used widely in open agricultural fields in Iran;
- No program baiting, Permanent baiting, No later removal;
- No best practice guidelines followed;
- Wide use in cities as biocides/ some program baiting/ awareness followed.

Unless under the supervision of a pest control operator / other competent person, do not use anticoagulant rodenticides as permanent baits.

Impact of second generation anticoagulant rodenticides on non-target wildlife

- According to well documented decades scientific research: there are disastrous impacts;
- Anticoagulant rodenticide (AR) poisoning has emerged as a significant concern for conservation and management of non-target wildlife (Mourad et al, 2012) ;
- Exposure to rodenticides pose big danger for predators/ scavengers when they prey on dead/ moribund rodents.

Hernandez-Moreno et al, 2013, (BRAKES & SMITH, 2005- Elmeros, et al, 2011- Dashti Khavidaki, et al, 2014……Many refs)

THINK WILDLIFE

Campaign for Responsible Rodenticide Use

Wildlife poisoning by Poison-baits in Iran

- Lots of deliberate intoxication of wildlife by poison baits by herd owners, animal husbandry farms, illegal hunters;
- Feeding of wildlife on these poison baits in Iran;
- Installing signs/ banners etc. in places of toxic bait use does not exist in rural agricultural areas and it is in its starting phase in Iran;
- So reporting only to DoE offices/ environmental conservation guards, many of them (115) already killed, very good, my experience 40 years ago.

Conclusions

My recommendation to the: resolution of the GMGSF (UNEA2:

- The big problem was and unfortunately still is:
- lack of proper regulations, in particular weak/ no enforcement (resolution of the GMGSF (UNEA2), (https://www.linkedin.com/in/ahmad-mahdavi-74839a75/).

Some of my recommendations to our SAICM HHP discussions in next slides.

Our 1st HHP discussion: 21 October 2020
SAICM/UCT HHP CoP Discussion 4: Overview of the HHP Global Action Plan and way forward Implementation mechanisms of the Global Action Plan on HHPs.

Part 1 – The targets of global action plan on HHPs and role of the stakeholders in the implementation mechanism

The first discussion of 2021 built on the last Highly Hazardous Pesticides (HHP) Community of Practice (CoP) discussion held on 21 October 2020, which solicited input from various stakeholders on the:

Draft Global Action Plan (GAP) on HHPs jointly developed by FAO, WHO and UNEP.

This CoP discussion continued the discussion on the GAP by focusing on targets and implementation mechanisms looking at the process for measuring progress towards the objectives and targets of the GAP.

The GAP on HHPs calls for global action by all relevant stakeholders on addressing HHPs, including a progressive elimination of poisonings and contamination caused by HHPs and a progressive phase-in of alternative measures.

It outlines the need for concerted efforts to mainstream the regulation and sound management of HHPs and contribute to the achievement of the Sustainable Development Agenda 2030. In addition, since ICCM4 in 2015, HHPs are listed among SAICM's Issues of Concern. As outlined in a recent UNEP report on Issues of concern, HHPs need to be comprehensively tackled at the global level and rigorous international actions are urgently needed to address the challenges posed by such pesticides. Therefore, the GAP on HHPs and implementing activities are key components of post-2020 framework on chemicals and waste management.

My answer to the Q.: In your view, is the Global Action Plan on HHPs necessary?

- **Our 1st HHP discussion: 21 October 2020**
- Background: Members of the HHP CoP are being asked to reflect on whether a Global Plan of Action as outlined in the draft document is needed and why they think this is the case. If such a plan is not needed, members are invited to explain why.
- **Question 1: In your view, is the Global Action Plan on HHPs necessary?**
- Yes of course, this is the exact question and answer that I have been following for the past 2-3 decades following observing the high negative effect of HHP in my country Iran, nearby countries and globally, no strong action by global regulatory agencies FAO/ WHO/ UNEP, etc.
- In fact these UN agencies were prepared to do their best but problems were the Big Gaps, please see my discussion some years ago about “More exposure ..in developing countries..as compared to developed world.
- Lack of communications between South and North, corrupt government in some developing countries and many other issues prevented these UN agencies for being able to have their efficient effects to prevent/ stop HHP in developing countries. I already had many discussions exactly about these GAPS during the past 10 years.

My answer to the Q.: What are the key issues that you think the Global Action Plan should address?

- **Question 2: What are the key issues that you think the Global Action Plan should address?**
- Considering the very bad situation with workers/ human mortalities due to exposure to HHP in many developing countries and considering that developed world have much less mortality with higher pesticide usage compared to developing countries we need immediate action for much stronger enforcement procedures in developing countries with FAO/ WHO/ UNEP. I exactly pointed to this issue and you can find it in the GMG report of the UNEA2 2016 in Nairobi, also in my LinkedIn page.
- Another important issue is the situation of obsolete pesticides in these developing countries that need stronger actions by these UN agencies.
- Another important issue is preventing pesticide corporations for production and sale of these HHP, now unfortunately some are in industrialized Asian and South American companies.
-

My answer to the Q.: What are your suggestions for the best approaches to implement the Global Action Plan?

- **QUESTION 3**

- Background: Obviously, the Global Plan of Action is only effective in addressing HHPs globally if it is implemented. Members are invited to come up with ideas for the implementation of the full plan, as well as components of the plan. Roles of responsible stakeholders especially FAO/WHO and governments, implementation mechanism, and monitoring should also be thought about.

Question 3: What are your suggestions for the best approaches to implement the Global Action Plan?

My answers:

- Surely FAO/ WHO/ UNEP should be prepared to revolutionize! The situation of enforcement actions to prevent HHP in developing countries and to do this as I mentioned in my previous discussion these agencies should make sure about the existence of proper "Certification and Licensing" for pesticide use in developing countries.
- These UN agencies are responsible to make sure that all HHP related/ genuine stockholders in developing countries are given possibility for expressing their idea, etc. and possibilities for action, observation, etc. in all implementation plans.
- We need strict control on all pesticide producing, formulation, distributing, etc. companies in developing countries by related organizations that usually are under/ called Plant Protection Organizations and so under control and watch by these UN agencies.
- According to my personal observations in big pest outbreaks like the locust that is going right now we need more control and watch for misuse/ abuse of the HHP, lots of damage goes to environment and wildlife.
- In recent years there are high research going for new/ sophisticated types/ formulations of pesticide particularly insecticides that these UN agencies should support these scientific actions for development of pesticides with Non-Nerve targets. Unfortunately, there are still lots of OPs insecticides basically based on war nerve gases Sarine, Soman and Tabun in use in many developing countries.

Conclusions

My recommendations to our SAICM HHP discussions

- A special team of 3-4 scientists working in connection with the Ministry of Agriculture and Ministry of Health. The FAO, WHO, SAICM, BRS, should control and deal with enforcement issues in the field.
- - A special team of 3-4 scientist (entomologist, chemist, ecologist) to look for alternatives in labs and globally.
- - Evaluation team consist of high-level scientist reporting to the highest authorities in the country.
- Government ministries that work with importing pesticides need to prevent HHPs from entering the country.
- - Local NGOs and community workers need to raise awareness and report on HHPs that have been prevented from being imported into the country.
- - Academia and governmental scientist.

Proper “Certification and Licensing” for pesticide use in developing countries

- This is a real problem here and may be in some other Developing Countries:
- Dangerous jobs of handling, carrying, selling and spraying, etc. are given to ordinary people and there is no real inspections;
- So where is workers protection and occupational rules? To be followed in Developing countries;
- Now it is decades that I am giving alert about this problem..

Actions needed (our discussions)

- Many participants supported the total phase-out provided several elements are in place, such as:
- - Active implementation of Integrated Pest Management (IPM);
- - Recognition that some HHPs are easier to phase out than others;
- - Availability, accessibility and affordability of alternatives, and
- - Buy-in from all relevant stakeholders (including farmers).

Information exchange between countries was identified as important for the phasing out of HHPs

- For example, sharing experiences and the feasibility of phasing out by learning from countries who have successfully phased out HHPs, such as Mozambique, How to share these experiences needs to be explored.
- Also, information sharing between organizations, such as the work of the PAN was suggested. Where data and capacity are limited, using decisions made by countries with a similar context was encouraged.

IPM as an alternative for HHP

- All seven IPM methods that were mentioned in the discussion existed for approximately 50 years;
- However, it is rarely followed correctly by farmers because of industry/pesticide corporations' pressure and the exportation of HHPs from high-income countries (HIC) to low-to-middle income countries (LMICs);
- If the defined economic lines like economic injury level, etc. are followed correctly and pest populations are managed at a lower level, HHPs won't be necessary.
-

Acknowledgement

- I thank you help of IHPA organizers for supporting my travel and participation in the 14th HCH & Pesticides Forum, 2023 in Zaragoza, Spain. My special thanks and appreciation to Mr. J. Vijgen;
- Now it is decades that my life is totally dedicated to protect people and environment against toxic pollution with a very simple life under 3R concepts (reduce, reuse, recycle), despite hardship.

Thank you
Questions?

- Only after the last tree has been cut down,
- only after the last river has been poisoned,
- only after the last fish has been caught,
- only then will you find that money cannot be eaten.'
- CREE INDIAN PROPHECY.

14th International HCH and Pesticides Forum

THANK YOU FOR YOUR ATTENTION

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Sustainable Agriculture and Environment for IRAN