

## **HLPE Special International Seminar**

# **Agro-ecology for Sustainable Development: Current Knowledge and Potential**

Swiss Agency for Development and Cooperation (SDC)  
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Distinguish Guests, Ladies and Gentlemen,

I am thankful to SDC (Swiss Agency for Development and Cooperation) for providing me an opportunity to discuss “Agro-ecology from Development perspective”.

It was largely recognized that agricultural innovations has been a major engine for transformation of food production and farming over the last century. It has also been equally understood that many technological innovations in agriculture has been generating significant extent of negative externalities which is adversely affecting agro-ecosystems and bio-diversities.

In the 1960’s, **Rachel Carson’s** book on “**silent spring**” created a new sense of understanding regarding unexpected impacts of the intensive use of chemical inputs on environment. It was strongly realized that concentration of pesticide residues in food chains is adversely impacting birds of prey, predatory insects, field workers, and consumers.

In response to it a movement was started to scientifically estimate the externalities of using agro-chemicals in agriculture systems throughout in the world. Global Integrated Pest Management (IPM) facility was instrumental in carrying out policy analysis of using agro-chemicals in the world during 1990's. The findings from these policy studies were shared with academia, researchers, policy makers and pesticide manufactures/distributers and development partners. Simultaneously, IMP practionners made concrete efforts to develop a critical mass of master trainers for training farmers to promote good agricultural practices based on agro-ecological principles.

This initiative was initially kick started from Indonesia in late 1980's after realizing hazardous effects of the use of highly toxic pesticides being aggressively promoted both by the industry and government. It was also scientifically established that pest species were becoming resistant and in some cases resurgent.

Pesticide Policy studies Pakistan estimated huge environmental and social cost of pesticide use. Externality of pesticide use was estimated around Rs 12 billion per annum only from 9 cotton growing districts of Paksitan's Punjab. About 49% of this external cost was attributed to the pest resistance problems, while 29% to loss in bio-diversity and nearly 20% occurred to human and animal health. The damage prevention cost on residue monitoring and public awareness was less than 2%. These Analysis proved that such a tremendous cost of pesticide use not only drains the financial resources, but also presents a growing threat to the people and environment of the country.

It was concluded that chemical based control programme in crops has actually increased the pest problems, disturbed the agro-ecosystem and has killed the non-target and environment friendly organisms such as parasitoids, predators and birds. Disturbance in an agro-ecosystem led new pest problems through resurgence and resistance processes in the naturally occurring pest populations. It was understood that over and misuse of pesticides has led to tremendous economic losses and hazards to human. The results of pesticide policy analysis projects strongly advocated the adoption of eco-friendly approaches for sustainable and environment friendly production.

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Ladies and Gentlemen,

The Integrated Pest Management led Farmer Field School (IPM-FFS) approach was developed and successfully implemented in any many countries. FFS is an interactive and participatory learning by doing approach. Participants enhance their understanding of agro-ecosystems, which leads to production systems that are more adapted to local conditions while optimizing the use of available resources. They aim to improve farmers' livelihoods and recognize their role as innovators and protectors of natural environments.

The educational concepts underpinning the FFS approach are drawn from adult non-formal education. EU funded FFS-led cotton-IPM program was launched in 5 Asian countries including China, Pakistan, India, Bangladesh and Vietnam. In the case of Pakistan, the impacts of this project was realized in terms of 65% increase in profitability, 41% reduced pesticide, 71% improvement in EIQ, higher pest predator ratio on IPM plot (106 vs 36),

social recognition of participating farmers among fellow communities, 16 percent reduction in poverty etc. The main problem with such approaches are that these are demanding in terms of cost of training, regular attendance of sessions by farmers, trained facilitator availability and budgetary allocations.

According to current experiences with National Agricultural Research System, many technologies developed have ecological perspective under prevailing climate change and natural resources degradation scenarios. Few of these innovations currently in development and promotion processes are:

1. Development of direct seeding drill for wheat planting in paddy fields to address rice residues burning problems;
2. Bio-fertilizer or bio-zote development for leguminous and non-leguminous crops;
3. R&D initiatives for pulses as leguminous crops for human and soil health;
4. Bio-fortified crops: Vitamin A and Protein rich Maize, Zinc rich wheat;
5. Dry rice sowing technologies for saving water and arsenic management;
6. Low delta crops like olive promotion in dry ecologies;
7. Clean energy use for cost effective production and farm level value addition;
8. HEIS for high value crops promotion;
9. Water reservoirs building and command areas development;
10. Rural transformation for inclusive growth.

There is a strong need for all stakeholders to work together to scale-up the the use of eco-friendly innovations for achieving sustainable agricultural development goals. Civil society, development partners, private sector and scientific communities can join hands to promote eco-friendly innovations in a faster pace at a large scale.