Larval Source Management (LSM) for VBDs in Pakistan

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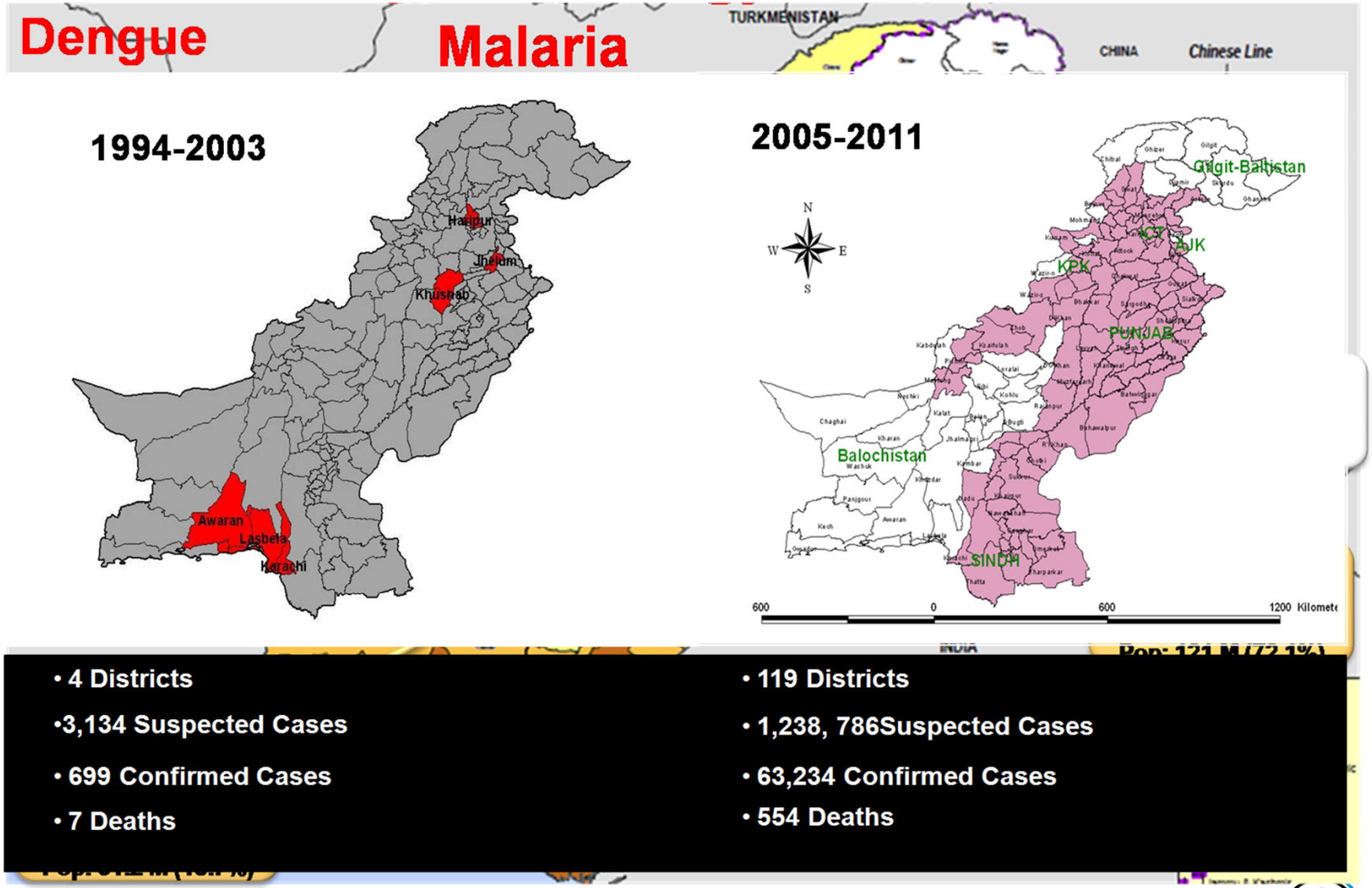
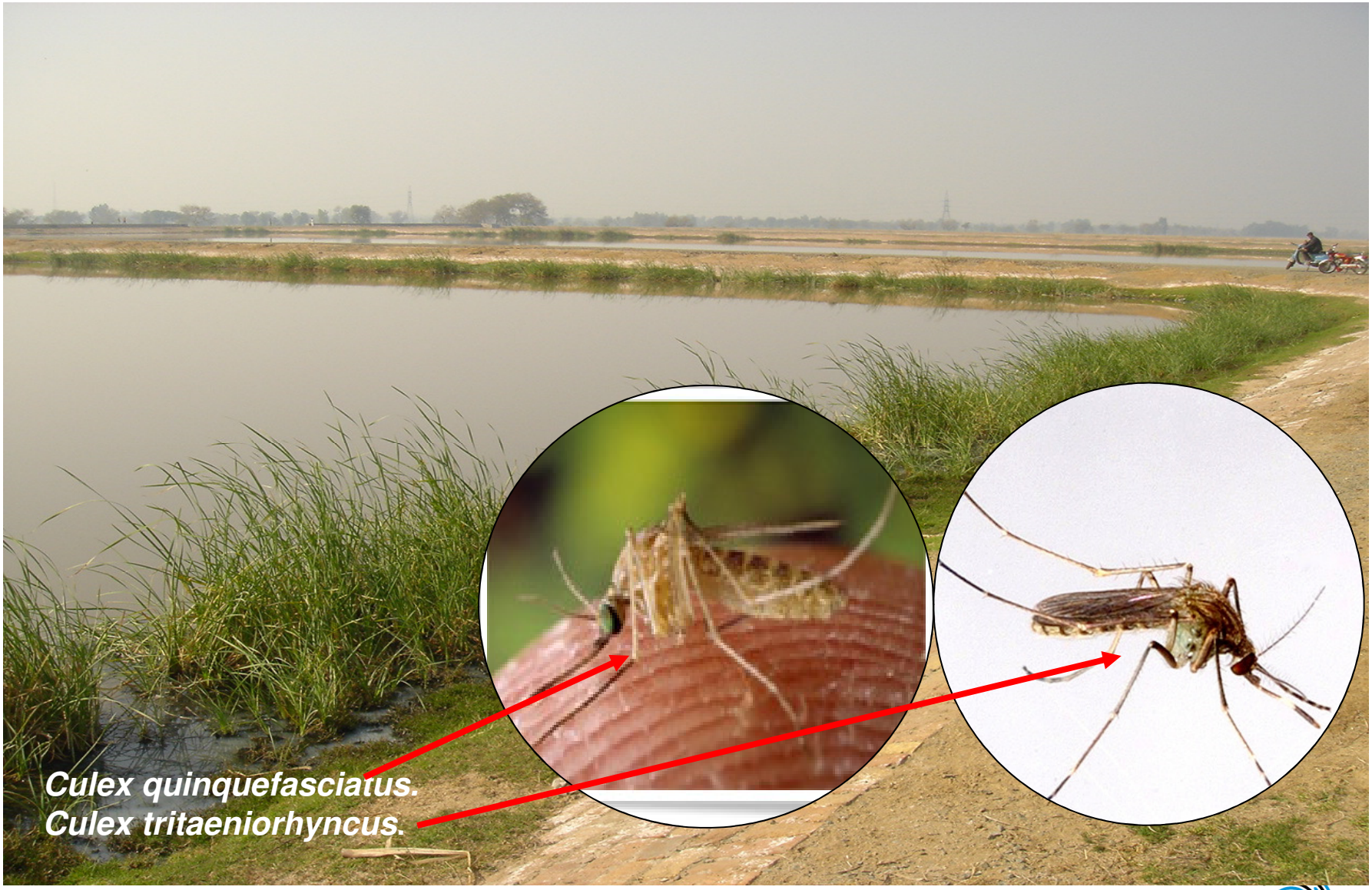
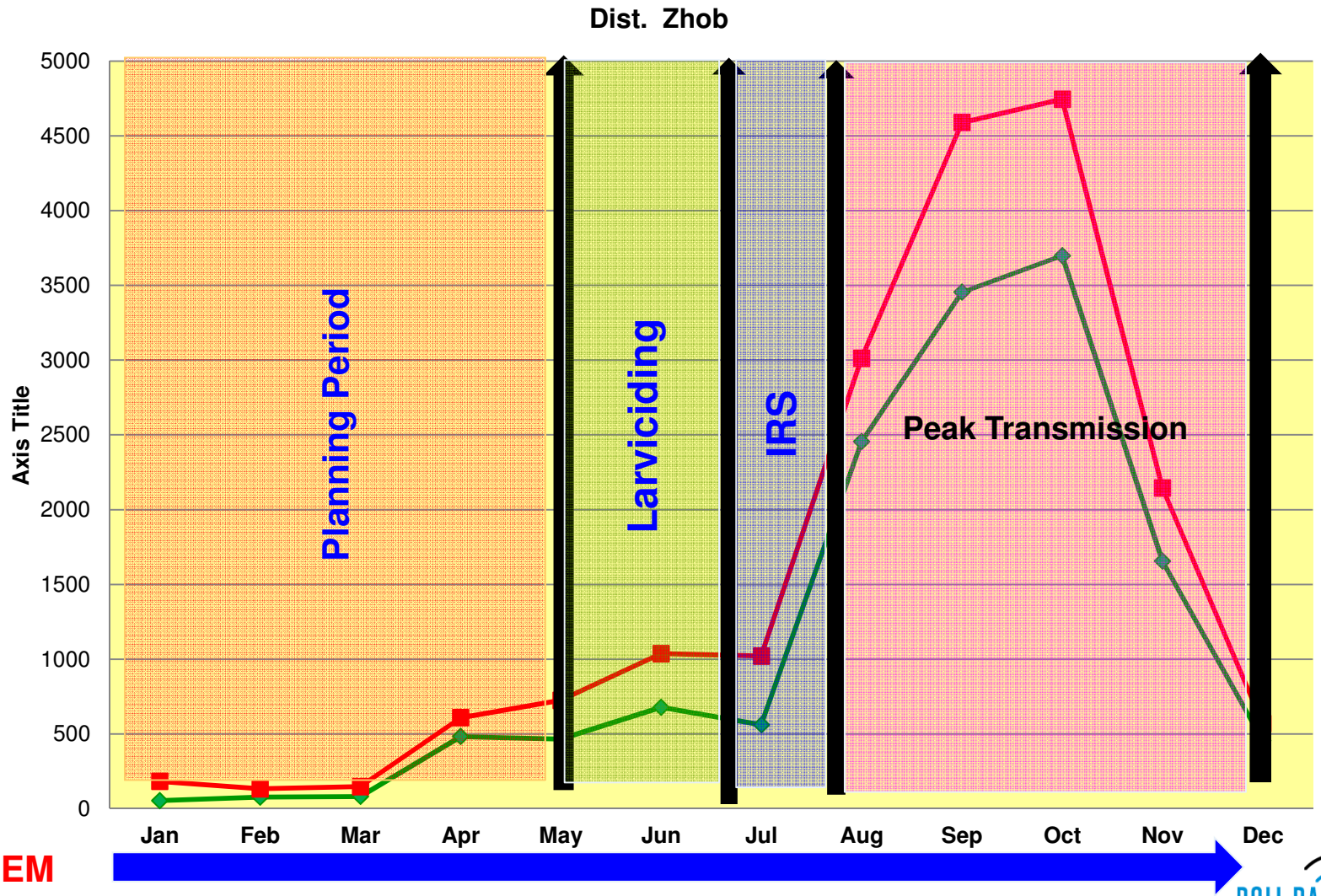
Major Vector Borne Diseases & LSM in Pakistan



Nuisance mosquitoes in Pakistan



National V/C Guidelines and Strategy



Larval Source Management (LSM): *Rationale*

Malaria

- Supplementary to IRS and LLINs
- Limited & Fix breeding sites
  - Fish ponds
  - Water Tanks
  - Water-courses
  - Irrigated fields

- *An. culicifacies* and *An. stephensi* are susceptible

Larval Source Management (LSM): *Rationale*

Dengue

- Made-made domestic (drinking water habitats)
- Mostly inside the houses
  - Ungrounded water tanks
  - Earthen pots
  - Drums
  - Discarded containers

Larval Source Management (LSM) in Pakistan

Management of all potential breeding sites to prevents/minimizes the vector breeding and hence reduces *human-vector contact* and transmission risk

Methods of LSM in Pakistan

LSM is part of national V/C strategy and guidelines which focuses;

- **Larviciding**
- **Environmental Management (EM)**
  - **Habitat modification**
  - **Habitat manipulation,**
- **Biological control**

National Vector Control Guidelines

- **Larviciding should be done during "Dry months i.e. May & June" breeding sites are "*Limited, easily Recognizable, Accessible & Manageable*"**
- **Larviciding should be carried out very carefully;**
  - **Proper Breeding Sites Assessment Surveys (BSAS) and mapping**
  - **Specifically after the evaluation of resistance level against in-use Larvicide(s)**
  - **At site where proper *target life-stage* of mosquito larvae are present.**
- **For most efficient larviciding program, treatments must be;**
  - **Repeated at fairly short cycles (7-10 days & 3-4 cycles/month).**
  - **Carrier out for at least 2 M for both nuisance and vector mosquitoes.**

National Vector Control Guidelines

- **Currently used larvicides are;**

  - **Temephos**
  - **Fenthion**

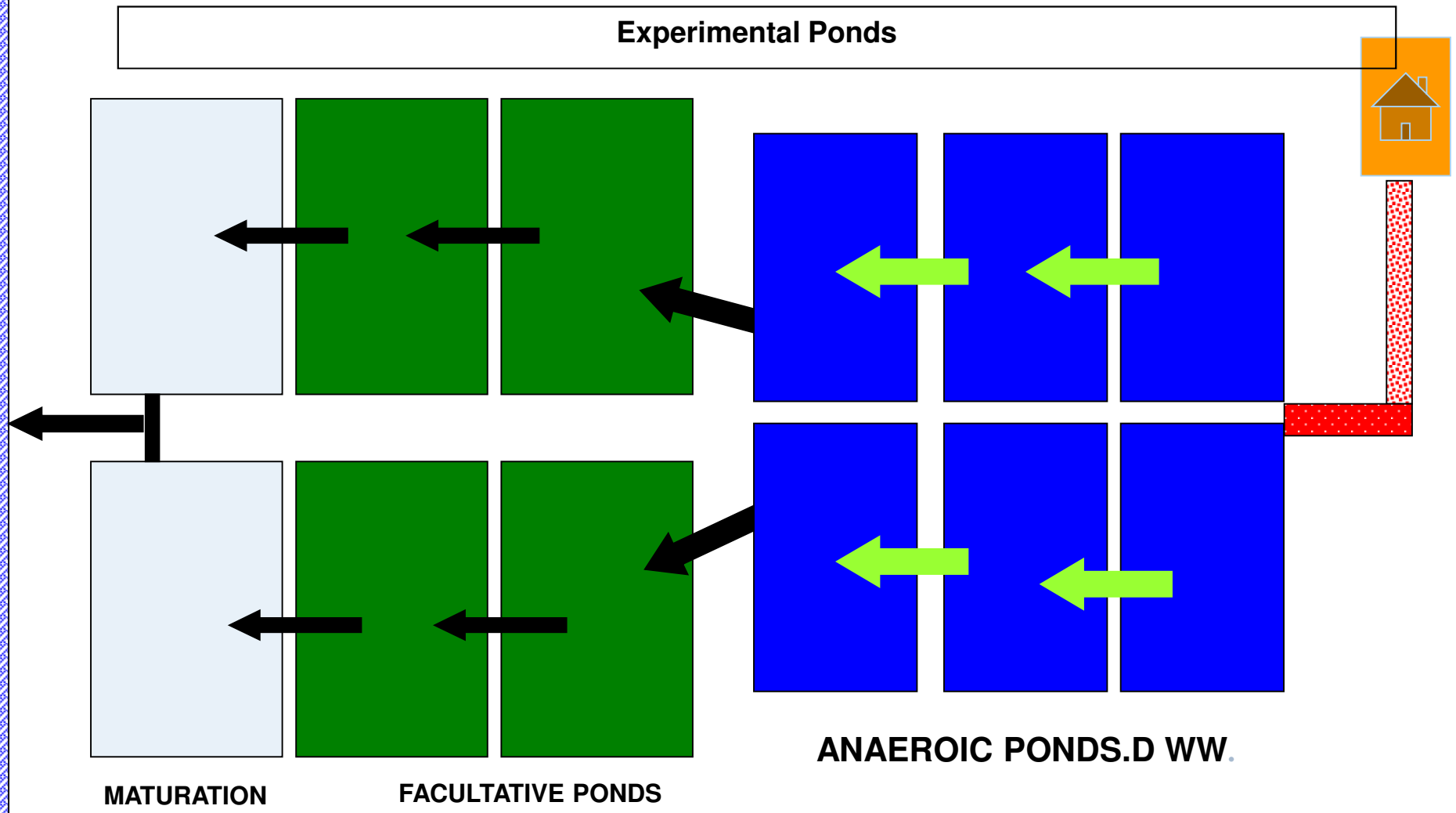
  Malaria

  - **Pyriproxyfen (Sumilarv 0.5G),**
  - **Methoperene**
  - **Diflubenzuron (IGR).**
  - **Bacillus Thuringienesis (B.t.i), B. israelensis (B.s).**

  DENGUE

Successful stories of LSM in Pakistan

Environmental management of WWSPs.



CONTROL PONDS

Intervention No: Removal of grasses

INTERVENTION NO. 1

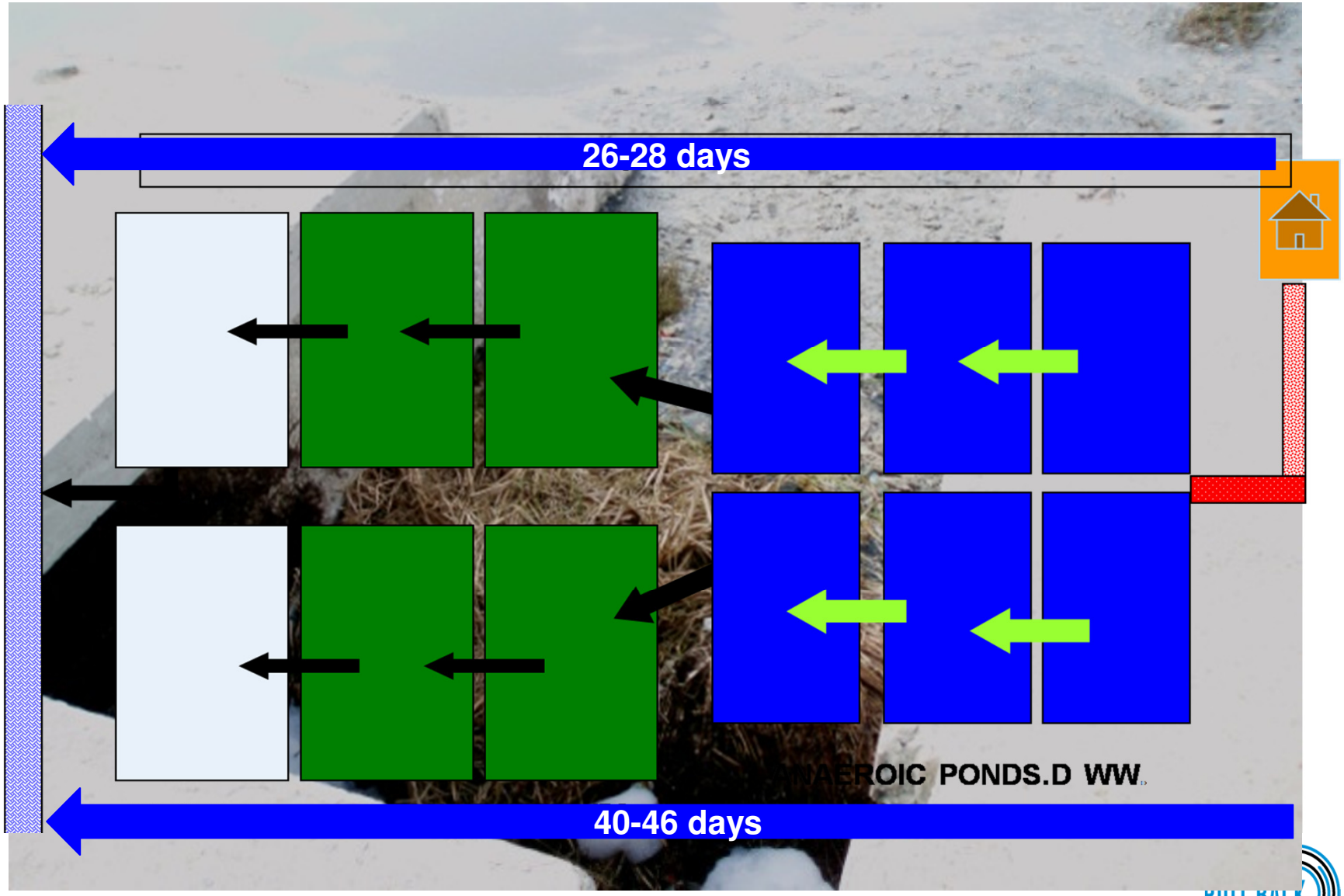
ENVIRONMENTAL MANAGEMENT

- Removal of emergent vegetation
- Repairing of slanting walls (if broken)

EXPERIMENTAL PONDS

Intervention No 1: Removal of grasses

INTERVENTION NO. 2: MAINTENANCE OF WFR




Intervention No 2: Maintenance of flow rate

EXPERIMENTAL PONDS

I think I have done it!!!!!!!

VECTOR DENSITIES IN WSPs (2006 & 2007)

Species	Anaerobic P		Facultative P		Maturation P	
	Control	Experimen	Control	Experimen	Control	Experimen
	(n=234)	(n=234)	(n=156)	(n=156)	(n=78)	(n=78)
An. stephensi	0.4	0	9.6	0	7.7	0
An. subpictus	27.0	0	6.4	0	5.1	0
An. culicifacies	0	0	0	0	5.1	0
Total anophe. (21829)	27.4	0.0	12.8	0.0	7.7	0
Cx. Quinquefasciatus	51.2	0	7.7	0	2.1	0
Cx. tritaeniorhynchus	24.8	0	18	0	10.3	0
Cx. pipiens	35.5	0	1.3	0	1.3	0.2
Cx. pseudovishnui	1.2	0	11.5	0	9.3	0
Cx.bitaeniorhynchus	0	0	1.2	0	1.7	0
Total culex (277393)	51.7	0	19.2		10.3	
Total Mosquitoes (299222)	52.2	0	19.9		11.5	

LSM & Dengue Control in Punjab

Since 2005, in Pakistan, dengue is the fastest emerging arboviral infection. Lack of inter-sectoral coordination, planning, trained human resources, surveillance systems and effective monitoring and evaluation are the major current challenges to designing evidence-based, cost-effective, community-friendly and sustainable dengue vector control strategies. In 2011/12, IVM strategies were optimally implemented in Pakistan, particularly in the Punjab province, which proved outstandingly successful in controlling dengue fever and dengue hemorrhagic fever (DF/DHF).

LSM & Dengue Control in Punjab

Legislation: Govt. Of Punjab framed a comprehensive legislative entitled "*The Punjab Prevention and Control of Dengue Regulations, 2011*" which focuses all areas of Environmental Management (LSM) which include;

- **Ban on old tyre business (storage at open places)**
- **Ban on all water habitats at public places**
- **Discourage water storage practices**

This was done through;

- **Inter-sectoral coordination,**
- **Community participation,**
- **Empowering local authorities and finally,**
- **Big penalty in case of failure in following the legislation.**

Reduction of cases from 22, 000 to 380 in 1 year

Conclusion

Larviciding (use of chemicals) still priority, particularly for MALARIA However, LSM (EM), also demonstrated its strong potential for sustainable management of VBDs in Pakistan

Outstanding success for dengue control during 2012 in the Punjab demonstrated that IVM is the only and best way forward to control dengue in a sustainable way.