

## PRESENTATIONS

### IWMI's Research

*Ian Makin, Regional Director Asia, IWMI*

The International Water Management Institute (IWMI) is a scientific research organization dedicated to studying the issues of the sustainable and productive use of water resources, particularly as they relate to agriculture, water scarcity and food security in the developing world. It is the only organization of its kind whose priority is to provide the scientific facts necessary to help developing countries reduce poverty through more effective management of their water resources.

In the past five years, the Institute has carried out dozens of research projects in Asia, Africa, the Middle East and Latin America. The objectives of this work are to:

- Identify the larger issues related to water management and food security that need to be understood and addressed by governments and policymakers.
- Help developing countries build their research capacities to deal with water scarcity and related food security issues.
- Clarify the link between poverty and access to water and to help governments and the research community better understand the specific water-related problems of the poor people.
- Develop, test and promote management practices and tools that can be used by governments and institutions to manage water resources more effectively, and address water scarcity issues.

The outputs of IWMI's work are to provide a clearer view of the situation that poor regions face, and new knowledge and tools to help governments understand and implement the changes needed. IWMI's research provides:

- *Poor people* with practical solutions to problems—such as groundwater depletion, water-borne diseases, salinization of farmland and unequal access to irrigation water—that threaten their food security, health and livelihoods.
- *Local communities*, with techniques and technologies to use their water resources more productively.
- *Governments* with research-based recommendations and support to help them make more informed water and agricultural policy decisions.
- *National and international organizations* with the tools and training necessary to generate and apply new scientific knowledge.

**IWMI**

**International Water  
Management Institute**

**Mission**

*Improving water and land resources management for  
food, livelihoods and nature.*

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**IWMI**

**IWMI's research activity  
addresses:**

- Alleviating poverty
- Increasing Productivity of water in agriculture
- Understanding Cross-sectoral water use issues

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**IWMI**

**IWMI research is characterized  
by:**

- Multidisciplinary approaches to water management research
- Long-term presence in developing countries
- Generation of International public goods
- A strong focus on knowledge transfer

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**Outputs and impacts**

- Better scientific understanding of issues on improved water resource management
- Science-based solutions for improved productivity, sustainability, and equity in water use
- Enhanced capacity for conducting research and managing water resources
- Transfer of know-how through collaborative research with developing country partners

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**Research Themes**

- Integrated Water Management for Agriculture
- Sustainable Small holder Land and Water Management Systems
- Sustainable Groundwater Management
- Water Resource Institutions and Policies
- Water, Health and Environment

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**Integrated Water Management for  
Agriculture**

- Develop and apply new research methodologies for assessing and improving irrigation water management performance in an integrated water resource management framework
- Identify key methodologies, processes and actions that will contribute to poverty reduction and food and environmental security.

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### Sustainable Small holder Land and Water Management Systems

- To identify and promote the uptake of appropriate small holder water management systems in order to contribute to better rural livelihoods of poor men and women and increases in water productivity

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### Sustainable Groundwater Management

- To develop and disseminate a more accurate and refined understanding of the socio-ecological value of groundwater.
- To identify and promote research on promising technologies and management approaches.
- To promote sustainability solutions amongst strategic players in national and regional groundwater systems

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### Water Resource Institutions and Policies

- Understand, through systematic comparative research, institutional arrangements and policy frameworks appropriate ways to improve the productivity of water in ways that promote livelihoods of poor men and women.
- Identify, test and evaluate research-based guidelines for water policy reform, organizational options and roles, and support systems for local management of irrigation that lead to more effective management of water in river basins.

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### Water, Health and Environment

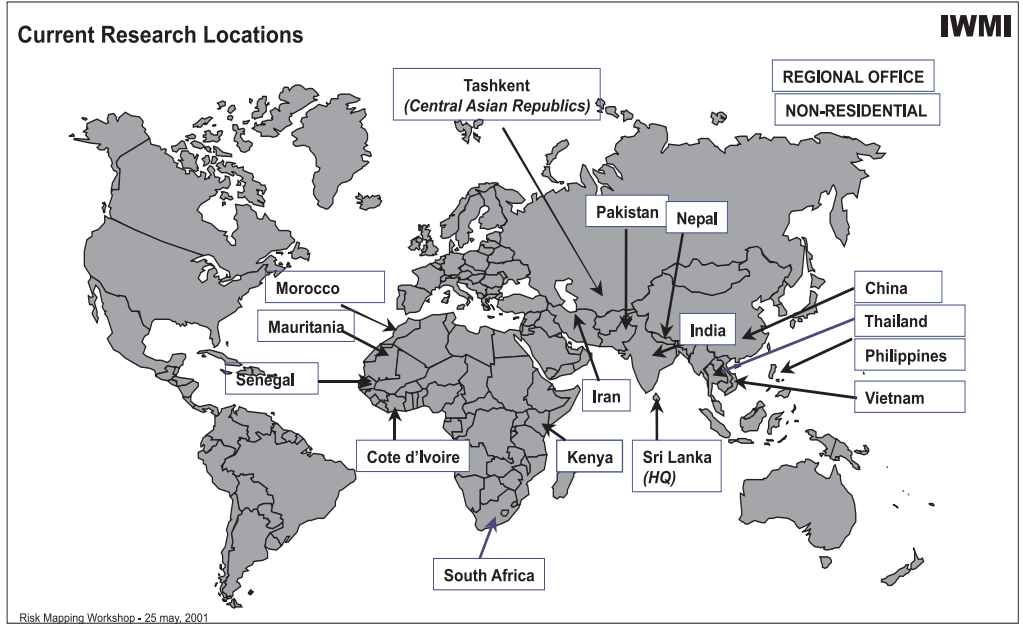
**Health**

- Bridge the gap between the water and health sectors
- Raise awareness and work towards the incorporation of health safeguards in water resources management and planning in rural areas through a research documentation and pilot field studies

**Environment**

- Bridge the gap between irrigation and environment sectors
- Scientifically document the relationship between irrigation, water management and the environment in an integrated manner

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## Malaria in Sri Lanka: Situational Analysis and Future Trends

Dr. W. P. Fernando  
Director, Anti Malaria Campaign, Sri Lanka

Malaria in Sri Lanka is characterized by high morbidity (210,039 confirmed cases in 2000), and relatively low mortality rates (76 reported deaths in 2000; e.g., 0.35 per 1000 patients). The most prevalent malaria species is *Plasmodium vivax* (70%), the rest of the cases are caused by *P. falciparum*. The principal vector is *Anopheles culicifacies* and the secondary vectors are *An. subpictus* and *An. annularis*.

Malaria is endemic in the 'dry zone' as the physical and climatic features are favorable for transmission in this area. In the intermediate zone epidemic type malaria predominates and the river system constitutes the main breeding habitat during dry weather when pooling occurs. In the wet zone malaria is focal and sporadic. Apart from this, several high-risk districts can be recognized. These are the northern districts at the frontline of the ethnic conflict: Killinochi, Mullaitivu and Vavuniya. No data are available for Mannar but this district probably has a similar caseload to the other northern districts. The other high-risk area is the district of Moneragala in the southeast of the island.

There are several factors that have had an effect on the malaria transmission pattern during the last decade.

Unfavorable factors are:

- the conflict situation in the North-East Province
- emergence of malathion-resistance in the vector population
- spreading of chloroquine resistance in *P. falciparum* malaria
- increasing intra-country population migration

Favorable factors are:

- increased reliance on self protection methods
- efforts towards early detection and treatment of patients by Mobile Malaria Clinics
- action to forecast and prevent malaria outbreaks

Future needs in the malaria control program would be:

- to contain spreading chloroquine resistance in *P. falciparum*
- to prevent emergence of multi-drug resistant *P. falciparum* malaria
- a suitable drug policy specially for the treatment of *P. falciparum* malaria including drug resistant strains
- improved methods for forecasting of malaria outbreaks, including applications of GIS
- strategies for insecticide-resistance management in vector populations
- more reliance on sustainable and eco-friendly biological methods of vector control
- application of principles of the Roll Back Malaria Initiative
- a better understanding of the sociological aspects of malaria control

### Malaria in Sri Lanka

Situational analysis and future trends

Dr. Punsiri Fernando  
 Director,  
 Anti Malaria Campaign,  
 Sri Lanka

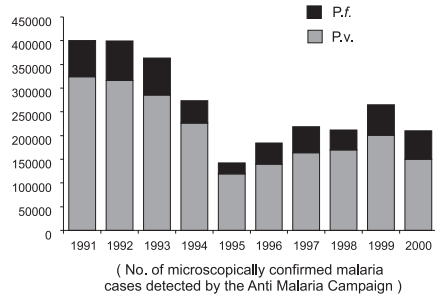
Morbidity - high (210039 confirmed patients in year 2000)

Mortality - very low (76 reported deaths in 2000  
 i.e. 0,36 / 1000 patients)

Prevalent species - *Plasmodium vivax* (72% in year 2000)  
*Plasmodium falciparum* ( 28% in year 2000)

Vector - Principal vector - *Anopheles culicifacies*  
 Secondary vectors - *Anopheles subpictus*  
*Anopheles annularis*

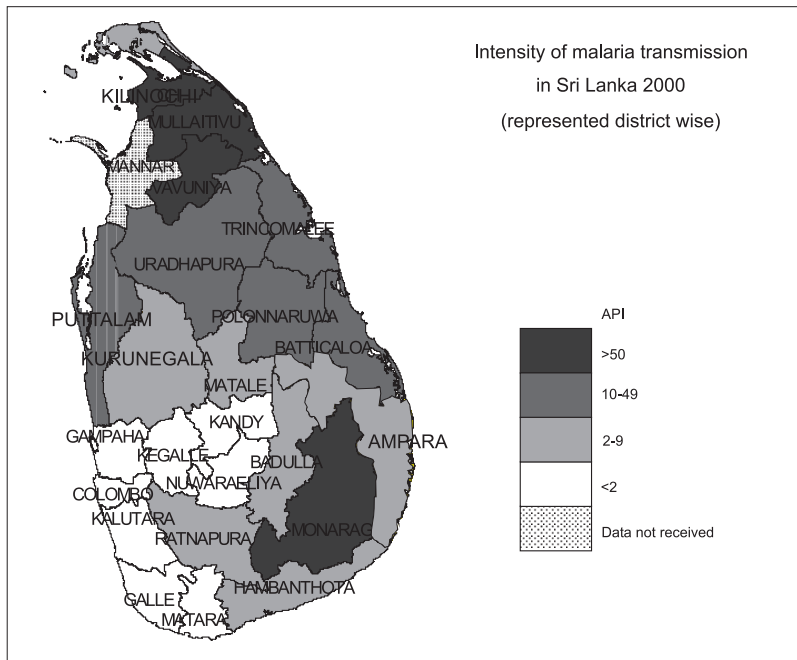
### Malaria Trends in Sri Lanka 1991 - 2000



### Transmission Dynamics

- Malaria is endemic in the "dry zone" as the physical and climatic features of the "dry zone" of Sri Lanka are very favourable for malaria transmission.
- In the "intermediate zone" epidemic type malaria predominates. The river systems constitute the main breeding sites during dry weather.
- In the "wet zone" malaria is focal and sporadic.

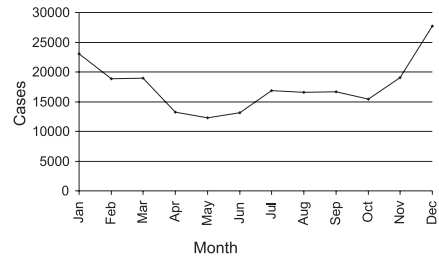
### Intensity of malaria transmission in Sri Lanka 2000 (represented district wise)



### Two transmission peaks are often seen

- Major peak    December - January  
                  follows North-East monsoon rain
- Minor peak    June - July  
                  follows South-West monsoon rain

Distribution of the malaria cases during the year 1998 showing the two transmission peaks.



### Some important factors which had effects on the malaria transmission pattern during last decade.

#### Unfavourable

- Conflict situation in the North-East Province
- Emergence of malathion-resistance in the vector population
- Spreading chloroquine-resistance in *P.falciparum* malaria
- Increasing intracountry population migration

#### Favourable

- Increased reliance on self protection methods
- Efforts towards early detection and treatment of patients by Mobile Malaria Clinics
- Action to forecast and prevent malaria outbreaks

### Objectives of the Malaria Control Programme

Reduction of the countrywide malaria incidence at least by 50% during the next 5 year period

To minimize the proportion of *P.falciparum* infections.

To eliminate mortality due to malaria

To prevent malaria epidemics

To prevent malaria in pregnant mothers.

To protect children below 5 years from malaria.

### Malaria control measures

Parasite control - detection and treatment of cases  
chemoprophylaxis

Vector control - adulticiding

larviciding - chemical - "Temephos"  
biological - larvivorous fish  
*Bacillus thuringiensis*  
Pyriproxifen (growth)  
hormone regulator)

Prevention of man-vector contact- bed nets (treated / untreated)  
screening of houses  
repellent smokes  
repellents to be applied on body

Future needs

- To contain spreading chloroquine-resistance in *P.f.*
- To prevent emergence of multi-drug resistant *P.f.* Malaria
- Suitable drug policy specially for the treatment of *P.falciparum* malaria including drug resistant strains.
- Improved methods for forecasting of malaria outbreaks, including application of GIS

- Strategies for insecticide-resistance management in vector populations
- More reliance on sustainable and eco-friendly methods of vector control
- Application of principles of the Roll Back Malaria
- Better understanding of sociological aspects of malaria control