

WORLD WATER WEEK

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Presentation

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World Water Week 2007

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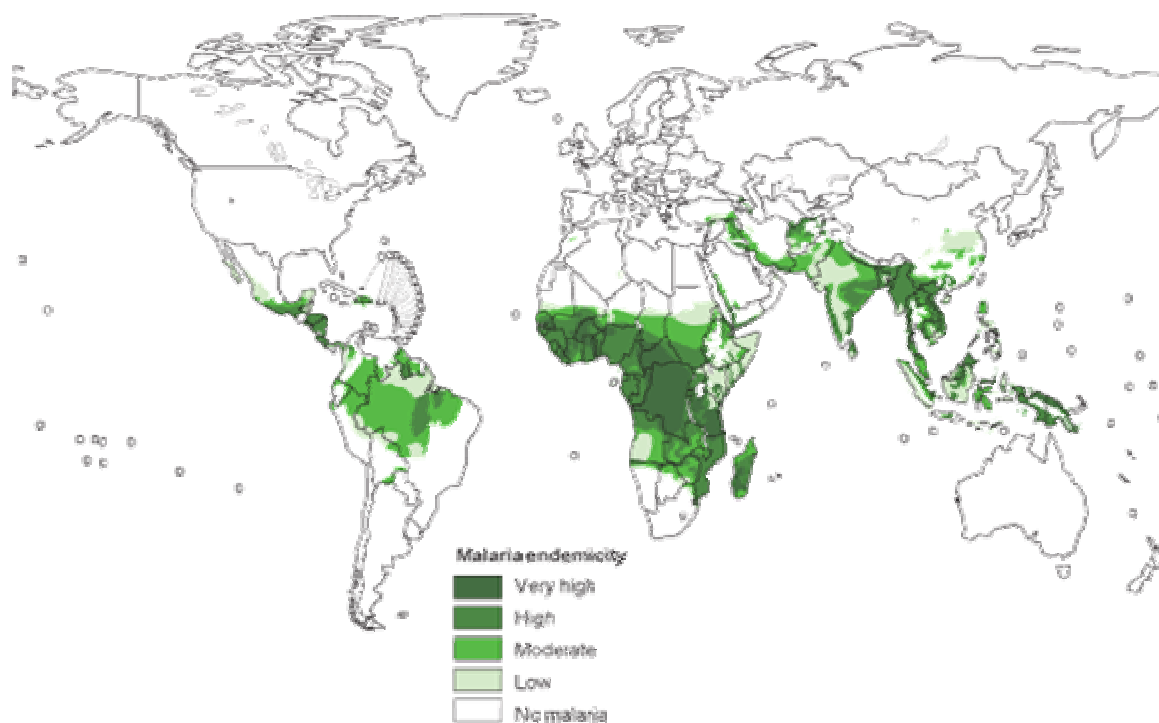
Public Health and Environment

VECTOR-BORNE DISEASE ATTRIBUTION TO IRRIGATION DEVELOPMENT AND MANAGEMENT



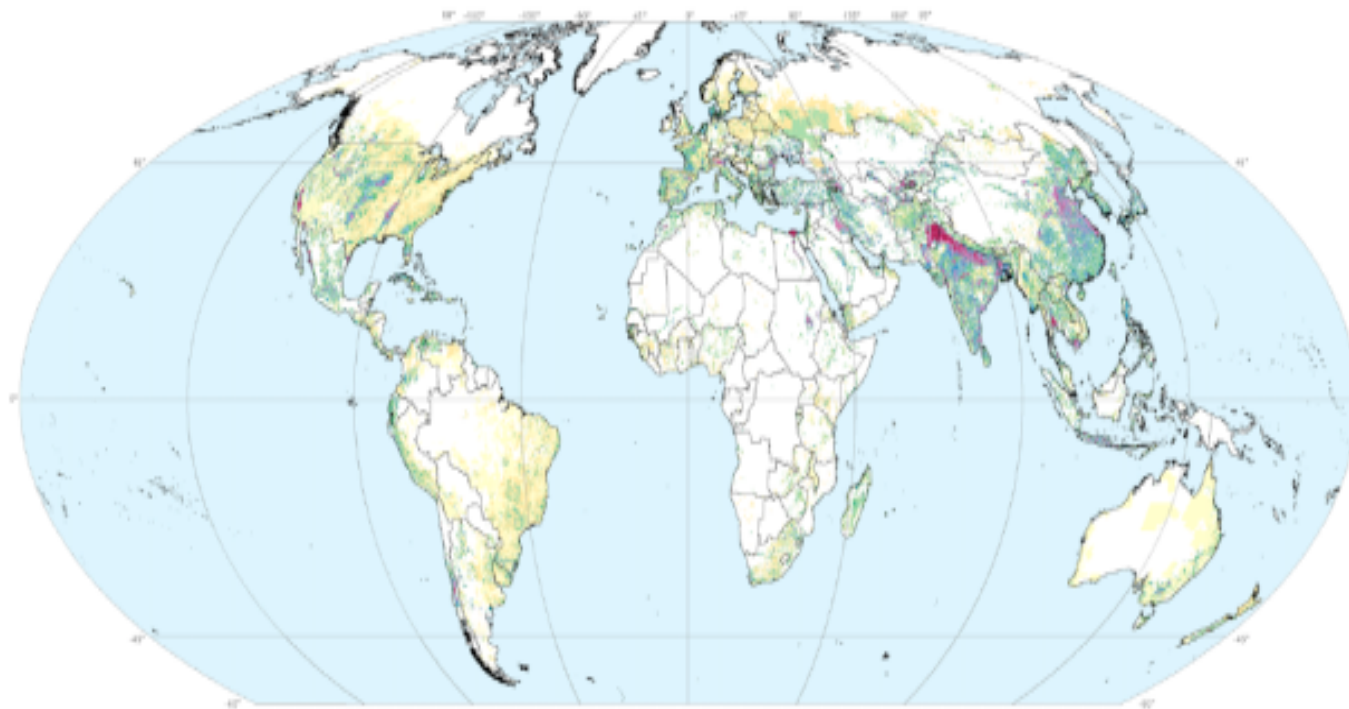
Robert Bos
Public Health and Environment
WHO, Geneva

Global distribution of malaria transmission risk (WHO, 2005)

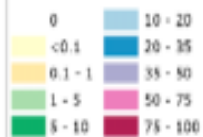


The digital global map of irrigation areas

February, 2007



Area under irrigation in
percentage of land area



The map depicts the area equipped for irrigation in percentage of cell area.
For the majority of countries the base year of statistics is in the period 1997 - 2002.

Projection: Mollweide

<http://www.fao.org/ag/agl/aglw/aquastat/irrigationmap/index.stm>

Stefan Siebert, Petra Döll, Sebastian Feick (Institute of Physical Geography, University of Frankfurt/M., Germany) and
Jippe Hoogeveen, Karen Franke (Land and Water Development Division, Food and Agriculture Organization of the United Nations, Rome, Italy)

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Four systematic literature reviews in 2005 and 2006

Swiss Tropical Institute, Basel; Princeton University, USA; WHO, Geneva

Meta-analysis of the association between irrigation and dams and

Malaria

46M DALY's lost in 2002,
90% in Africa South of the Sahara
>1M deaths per annum

Lymphatic filariasis

5.78M DALY's lost in 2002,
all disease and disability related

Japanese encephalitis

709,000 DALY's lost in 2002,
Restricted to E, SE and S Asia
Estimated 10,000 deaths per annum

Schistosomiasis,

779M at risk, 207M infected
In 76 countries (46 in Africa)



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Vector-borne diseases and irrigated agriculture Landscapes, Lifestyles, Livelihoods

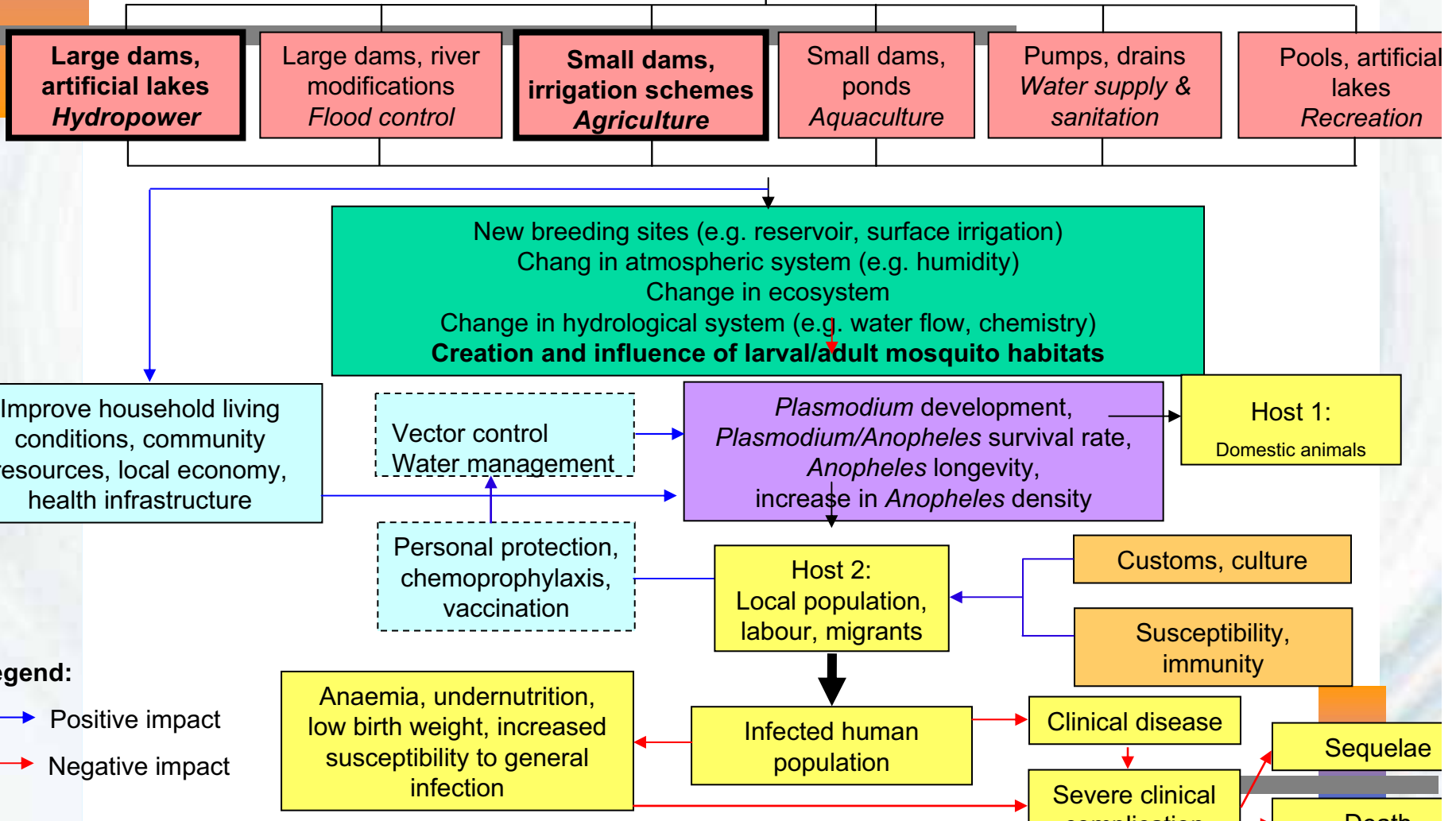


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Causal web

Water resource development and management



Malaria and irrigation in Africa South of the Sahara

Association between malaria and irrigation in stable regions (11 studies)

Less prevalence and incidence in irrigation communities than in non-irrigation communities – the complexities of the “paddy-paradox”

Association between malaria and irrigation in unstable regions (2 studies)

Shift from seasonal to perennial transmission, meso-endemicity to hyper-endemicity (Senegal); species shift (Madagascar); 150-fold increase in vectorial capacity (Burundi).

Of 637.3M people in Africa South of the Sahara, only an estimated 9M (1.4%) live close to irrigation schemes.

Land under irrigation: 4M ha, only between 0.2 and 0.5% of the total surface area.

Irrigation potential: **39.4M ha, mostly in semi-arid areas.**

Malaria and irrigation in South and SE Asia, and the Western Pacific

The many contextual determinants (e.g. a wide range of vector species, human migration patterns) make a generalized attribution of malaria in S and SE Asia to irrigation impossible. Of the estimated population living in the vicinity of irrigation schemes (145.1-771M), an estimated 122.9-659.6M live in malaria endemic areas.

Many individual studies in India and Sri Lanka do indicate, however, a **two- to five-fold increase** in transmission intensity as a result of irrigation development.

Only a small proportion of people in irrigation communities in the WP (26.5-69.4M or 1.2-3.3%) live in malaria endemic areas. One study (Lao PDR) shows a **higher malaria infection rate** in villages surrounded by irrigated rice fields compared to non-irrigated villages.

Land under irrigation: 10.6% and 6.9% of the total surface area, respectively; mainly for rice cultivation.

Irrigation potential in SE Asia: up to 22.4% of the total surface area.

Conclusions on malaria and irrigation

- It is impossible to quantify the attributable fraction of the malaria burden because of the insufficient database and many confounding factors.
- Uncertainty in the calculation of relative risks include possible over-estimation because of assumptions such as uniformity of all irrigation types, and uniformity in the distribution of populations associated with irrigation schemes
- Underestimation of the risks is possible because of down stream effects beyond the boundaries assumed, and because small dams and community irrigation systems may not be included in the global databases. These will have important, cumulative effects.

Schistosomiasis and irrigation in Africa South of the Sahara

Thirty-five data-sets from 24 studies allowed for the calculation of pooled random risk ratios of schistosomiasis with regard to the construction and operation of irrigation schemes. All originate in Africa.

Risk ratio estimates for urinary schistosomiasis related to irrigation 0.02-7.3

Risk ratio estimates for intestinal schistosomiasis related to irrigation 0.49-23.0

The Nile shift is an important phenomenon: irrigation introduction results in a shift from *S. haematobium* to *S. mansoni* (urinary to intestinal schistosomiasis).

The CA Brief – relevant recommendations

Strengthening of the evidence base through more research.

Development and testing of water management and hydraulic engineering solutions.

Health impact assessment of new irrigation schemes and rehabilitation of existing schemes.

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Health Impact Assessment

A combination of procedures, methods and tools by which a policy, programme or project may be judged as to its potential effects on the health of a population, and the distribution of those effects within the population.

See also the IAIA web site www.iaia.org

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Health Impact Assessment



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Justification

Economics (no transfer of hidden costs of development to the health sector: the most cost-effective health measures can be used).

Equity (vulnerability is at the heart of HIA – the focus is on the health status of those groups who are most affected by development).

Balance (HIA considers both negative and positive impacts and addresses them through health protection and health promotion measures).

Good governance (public participation, consideration of voluntary and involuntary risks, compensation, and compliance performance contracts are all good governance concepts compatible with HIA).

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Health Impact Assessment



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Building capacity

National capacities

Policy framework

Institutional arrangements

Human resource development

Procedural guidelines

Pilot HIAs

Bilateral and multilateral agencies

Policy (re-)formulation

Extending sector-wide approaches to intersectoral approaches

Performance standards and performance contracts

Allocations for public health management plans

IFC Performance Standards 2006



IFC's Performance Standards define clients' roles and responsibilities for managing their projects and the requirements for receiving and retaining IFC support. The standards include requirements to disclose information.



Performance Standards



Performance Standard 4 Community Health, Safety and Security

April 30, 2006

Introduction

1. Performance Standard 4 recognizes that project activities, equipment, and infrastructure often bring benefits to communities including employment, services, and opportunities for economic development. However, projects can also increase the potential for community exposure to risks and impacts arising from equipment accidents, structural failures, and releases of hazardous materials. Communities may also be affected by impacts on their natural resources, exposure to diseases, and the use of security personnel. While acknowledging the public authorities' role in promoting the health, safety and security of the public, this Performance Standard addresses the client's responsibility to avoid or minimize the risks and impacts to community health, safety and security that may arise from project activities. The level of risks and impacts described in this Performance Standard may be greater in projects located in conflict and post-conflict areas.



Performance Standards

Objectives

- To avoid or minimize risks to and impacts on the health and safety of the local community during the project life cycle from both routine and non-routine circumstances
- To ensure that the safeguarding of personnel and property is carried out in a legitimate manner that avoids or minimizes risks to the community's safety and security

Scope of Application

2. The applicability of this Performance Standard is established during the Social and Environmental Assessment process, while implementation of the actions necessary to meet the requirements of this Performance Standard is managed through the client's Social and Environmental Management System. The assessment and management system requirements are outlined in Performance Standard 1.

3. This Performance Standard addresses potential risks and impacts to the affected community from project activities. Occupational health and safety standards are found in paragraph 16 of Performance Standard 2, and environmental standards to prevent impacts on human health and the environment due to pollution are found in Performance Standard 3.

Thanks are due to Juerg Utzinger,
Jennifer Keiser and Marcel Tanner,
and I thank you for your attention.