Hygienic Aspects of Drinking Water Sources in Rural Areas of the Mekong Delta, Vietnam

A. Rechenburg and Dr. F. Dangendorf †
Institute for Hygiene and Public Health, University of Bonn, Bonn, D-53105

Background

Socialist Republic of Vietnam

- Population: 79,7 Mio.
- Territory: 329.241 sq. kilometers
- 64 provinces
- National capital: Hanoi
- 1,6 diarrhea episodes/year for children < 5 years

Research Area

Mekong Delta, Can Tho province

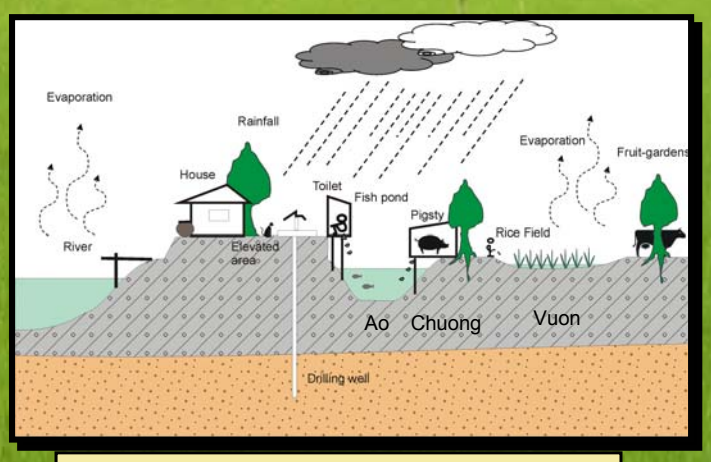
- 40.000 sq. Kilometers
- Delta population: 1,1 Mio.
- 88% of the population live in rural areas
- largest rice growing region of Vietnam
- Can Tho: economic capital of the Delta region

Introduction

The VAC model (Vuon=orchard, Ao=fish pond, Chuong=livestock farming) is the traditional farming system. Heavy fecal contamination affects the surface water which is the main source for drinking water, beside rain water collection during the rainy season. This poses health risks to all people living in this environment, in particular to farm workers. Over the last decades, projects from UNICEF, Oxfam and other NGO´s supported the use of ground water for drinking water, because it is usually hygienically safe. In this project hygienic problems of the present situation were analysed and further steps to improve the drinking water supply were discussed.

Methods

- Sanitary inspection of the households according to WHO standards
- Monthly analysis of water samples for E. coli, total coliforms, fecal streptococci and salmonella during one year
- Interviews with involved sociologists in three communities concerning consumption habits, health risk, and economic situation
- Collection and evaluation of available information, public health statistics and reports

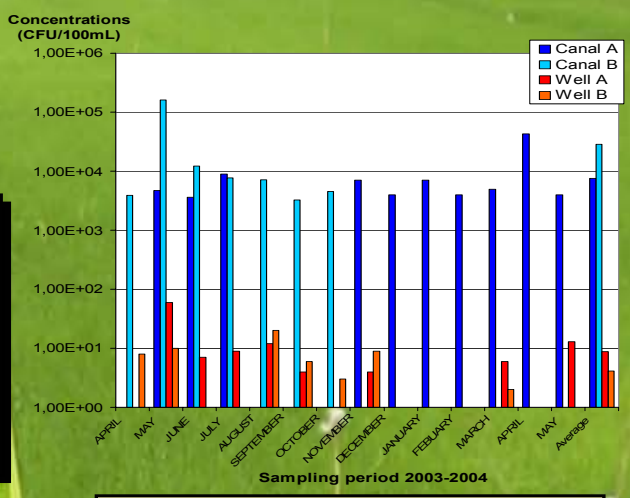


Scheme of a typical VAC farm in the Mekong Delta (T. Le Anh ; 2003)

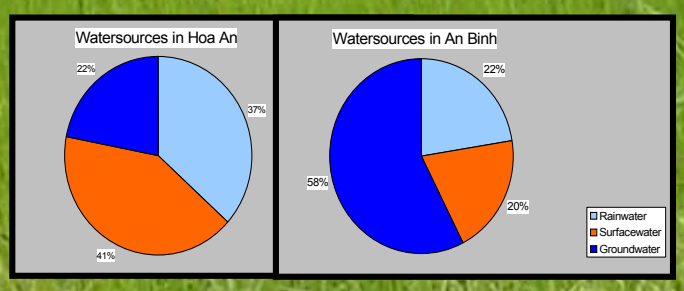
Pipe to collect drinking water out of a canal

Water source: canal

Groundwater well with storagepots in the back



E. coli concentrations in sources for drinking water

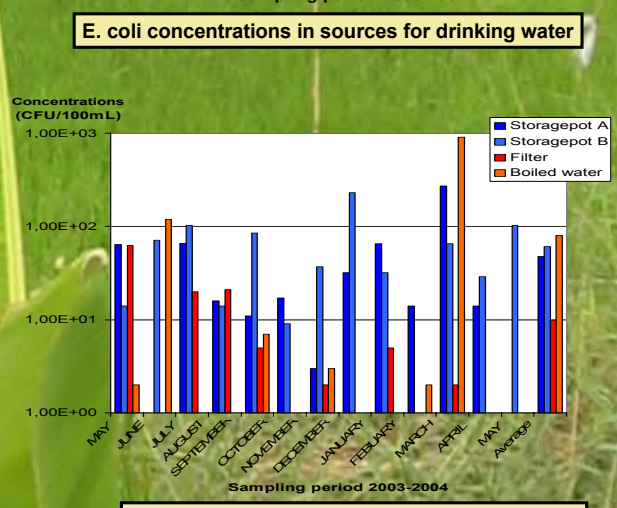


Distribution of drinking water sources in two different areas (Hoa An = rural and An Binh = periurban)

Storagepot for drinking water

Storagepot for drinking water from a water work

Storagepot and boiled water



E. coli concentrations in treated drinking water

Results

- Groundwater wells often deliver bad water quality (e.g. high iron and salt content)
- Fecal contaminants are often present, even in groundwater wells
- No difference in the microbiological water quality was observed between rain and dry season
- Maintenance of drinking water sources and drinking water storage is inadequate
- Several forms of treatment exist, all traditionally performed in clay pots
- Storage pots contain in average 10^2 E.coli/100 mL
- Surface water is preferred by the majority of the population
- Surface water is highly contaminated by feces, garbage, waste from ships, chemicals, etc.
- People in rural areas would like to use rain water instead of surface water

Possible solutions

- Building of waterworks at a community level
- Use of rain water
- Offer simple, but more effective treatment technologies, such as clay filters
- Strengthening of the awareness of drinking water hygiene, safe storage
- Biogas plants to provide sanitation systems, that reduce pollution of surface water

Germany
Institute for Hygiene and Public Health
University Bonn
Dr Friederike Dangendorf,
Andrea Rechenburg,

Vietnam
College of Technology
Can Tho University
Nguyen Vo Chau Ngan,
Vo Thi Yen Ph,
Nguyen Thi Thu Van

Fur
Federal Ministry of Education and Research