



# Protection goals, criteria and scenarios

**9-11 October 2007**

Rik van den Bosch (Alterra)  
Tao Chuanjiang (ICAMA)

Workshop Report WP3-1  
Beijing / Wageningen, 20 October, 2007

Sino – Dutch Pesticide Environmental  
Risk Assessment Project

## **Table of Contents**

<b>1</b>	<b>Purpose of the trip</b>	<b>2</b>
<b>2</b>	<b>Activities</b>	<b>2</b>
<b>3</b>	<b>Results / Observations</b>	<b>2</b>
3.1	General	2
3.2	Protection goal 'Groundwater as drinking water'	3
3.3	Protection goal 'Surface water'	3
3.4	Honey bee	4
3.5	Silkworm	4
3.6	Birds	5
<b>4</b>	<b>Agreements for follow-up</b>	<b>5</b>

## 1 Purpose of the trip

- To further detail the description of the projection goals
- To create more understanding on criteria and prepare activities for WP 4 for 2008
- To evaluate the activities carried out by CAAS in relation to scenario development and decide on further activities related to scenarios and models

## 2 Activities

See annex 1: programme of the workshop

## 3 Results / Observations

### 3.1 General

Up to now we have been discussing about risk assessment methods in general and the protection goals that will be addressed in this project in general terms. It is now time to further detail the boundaries of our project: what will we exactly develop over the next years?

The project will develop a risk assessment system with one or various tiers for each protection goal. It is important that we develop the outlines of a tiered approach for each protection goal relatively soon (end of 2007, early 2008). This includes a flowchart (or decision tree). Based on this framework we can define in much more detail which fate methods (models and scenarios), laboratory tests, and possibly field tests need to be developed. This will help to plan future activities and make more accurate estimations of required budgets, etc.

We also need to make preliminary decisions on the criteria: which criteria do we think should be used for which protection goal. The tiered approaches together with the defined criteria form the first version of the RA system that we develop. The system will be tested in WP 4, when about 100 pesticides will be screened using the system. The system itself and the results of this test will be described in a policy document. This document will be used to start discussion with policy makers on RA and criteria.

A protection goal has 3 aspects:

- What? ..... do we want to protect: which part of the environment, which species, etc?
- Where?.... do we want to protect: which type of surface water, groundwater at which depth? On specific geographical locations?
- How strict? ..... do we want to protect? What are the criteria? Also relates to long term effects and short term effects.

For each protection goal we have discussed these three questions in detail and results of these discussions are given below.

***Note that the protection goal 'persistence in soil' has been deleted from the list!***

### 3.2 Protection goal 'Groundwater as drinking water'

#### *What?*

Groundwater will be protected in such a way that it is suitable to be used as drinking water without purification. This holds true for all groundwater below a depth of x meters. X still to be determined by ICAMA.

#### *Where?*

Groundwater bodies all over China need to be protected. No exceptions in geographical sense. It is used that when groundwater in agricultural areas is protected the ground water outside agricultural areas is protected by definition.

#### *How strict?*

In contradiction with the EU in China tox-based criteria will be used for groundwater. For each pesticide a criterion will be developed based on the ADI. For metabolites no ADI available, Threshold of Toxicological Concern (TTC): approx. 0.75 ug/l in first tier. Higher tier possibilities.

#### *Actions:*

- Define tiered RA approach and flowchart
- TDI to be gathered / GV to be calculated
- Scenario development
- Hands-on experience with models
- Chapter in RA Handbook

### 3.3 Protection goal 'Surface water'

#### *What?*

- Ecosystems in the surface water
- Surface water is not protected as a source for drinking water (for the time being)

#### *Where?*

- All waters down stream of (what was called) channels. This can be small streams, ponds, marshland. As these types of water bodies are quit divers, it was easier to define what we do not want to protect: the channels. Definition of a channel, so far:
  - man made
  - used for irrigation and/or drainage
  - not-permanent water body
  - max. 2 m wide
  - max. 1 m depth

#### *How strict?*

- Class 2 effects (transient effects; short-term) or class 3 effects (full recovery within 8 weeks) acceptable (to be decided)
- Safety factors of EU (100 for acute toxicity) are on the safe side
- Lower safety factor may be acceptable

#### *Actions:*

- Define tiered RA approach and flowchart
- Check definition of protection goal (see presentation Jos, field visits)

- Develop scenarios
- Get hands on experience models
- Final selection test species for cold water fish
- Test development (OECD&GLP)
- Set preliminary criteria

### 3.4 Honey bee

*What?*

All honey bee species in China

*Where?*

China

*How strict?*

- Increase RQ from 50 to 200?
- Safety factor to protect all Chinese honey bee species?

*Actions:*

- Define tiered RA approach and flowchart
- Comparison of sensitivity of Chinese compared to European honey bee
- Decision on 'how strict?'
- Test development (OECD and GLP), including bee brood test for IGR

### 3.5 Silkworm

*What?*

Silkworm strains that are used commercially for silk production

*Where?*

China

*How strict?*

Very little mortality is acceptable. A maximum mortality due to the pesticide of 2 – 5 % under commercial breeding conditions has been proposed.

No criteria for chronic effects have yet been defined.

*Actions:*

- Provide written comments on the existing test guidelines (Alterra)
- Define tiered RA approach and flowchart for silkworm (ICAMA & Alterra)
- Review scientific literature about pesticide effects on silkworm (ICAMA & Alterra)
- Develop test methods and guidelines (dietary acute toxicity test, dietary chronic test, acute fumigation test, aged residue test (optional) (ICAMA & Alterra)
- Optional at later stage: standardise the guideline under the OECD Chemical Testing Programme. (ICAMA).

### **3.6 Birds**

- EU guidance document for birds is under revision
- Will be available in a months
- Will be addressed later

## **4 Agreements for follow-up**

On basis of these results Alterra will revise the workplan for 2008 and discuss with ICAMA.

## Annex 1 Detailed programme

<b>Date: Tuesday October 9, 2007 (Scenario's day 1)</b>		
<b>Venue: Meeting room 1218, Building 1, Yong'an Hotel</b>		
9:00-9:30	<p>Opening</p> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Director Ye: Opening</li> <li>• Rik: General outline of the workshop</li> </ul>	Host: Tao
9:30-10:30	<p>Presentation:</p> <ul style="list-style-type: none"> <li>• Considerations for the definition of detailed protection goals (focused on the question: 'Which types of water bodies do you want to protect?') for groundwater and surface water: <i>Jos Boesten, Alterra, Wageningen UR</i></li> <li>• Discussion</li> </ul>	Host: Rik
10:30-10:45	Break	
10:45-11:45	<p>Presentation:</p> <ul style="list-style-type: none"> <li>• Overview of first results of scenario definition and data collection: <i>Dr. Qin, CAAS</i></li> <li>• Discussion</li> </ul>	Host: Rik
11:45-13:30	Lunch Break	
13:30-15:30	Discussion: Which type of water bodies (both groundwater and surface water) will be selected for protection?	Host: Rik
15:30-15:45	Break	
15:45-16:45	<p>Discussion continues</p> <p>Or, if time allows us, we can choose to discuss :</p> <ul style="list-style-type: none"> <li>- the next topic "Criteria"</li> <li>- CAAS's questions about the models</li> </ul>	Host: Rik
16:45-17:00	Summary of the discussion : <i>Rik</i>	

<b>Date: Wednesday, October 10, 2007 (Criteria)</b>		
<b>Venue: Meeting room 1218, Building 1, Yong'an Hotel</b>		
09:00-10:30	<ul style="list-style-type: none"> <li>• Presentation: Environmental pesticide registration criteria applied in other parts of the world: <i>Harold van der Valk, Alterra</i></li> </ul>	Host: Tao
10:30-12:00	<ul style="list-style-type: none"> <li>• Discussion on appropriate registration criteria for China</li> </ul>	
12:00-13:30	Break	
13:30-15:30	<ul style="list-style-type: none"> <li>• Exercise: A first impression of the impact of criteria selection on pesticide registration in China</li> </ul>	Host: Tao
15:30-15:45	Break	
15:45-16:45	<p>Start up activity 4 of our project: study to assess the consequences of new environmental registration criteria in China. <i>Harold van der Valk, Alterra</i></p> <ul style="list-style-type: none"> <li>• Examples and exercises of possible study elements</li> <li>• Discussion of data requirements for the study</li> </ul>	Host: Tao
16:45-17:00	Summary of today	Host: Tao
<b>Date: Thursday, October 11, 2007</b>		
<b>Venue: Meeting room 1218, Building 1, Yong'an Hotel</b>		
09:00-12:00	<p>Discussion: preliminary selection of actual scenario's for groundwater and surface water. <i>Jos Boesten, Alterra</i></p> <ul style="list-style-type: none"> <li>• As we now know which type of water bodies will be protected, we can actually define scenarios that represent these types of water bodies.</li> </ul>	Host: Qin
12:00-13:30	Break	
13:30-15.30	<ul style="list-style-type: none"> <li>• Detailing data requirements for the different scenarios</li> <li>• Discussion</li> </ul>	Host: Qin
15:30-15:45	Break	
15:45-16:00	<ul style="list-style-type: none"> <li>• Summary of the discussion</li> </ul>	Host: Qin
16:00-17:00	<ul style="list-style-type: none"> <li>• Risk management: Harold ( If time allows us)</li> </ul>	Host: Tao

## **Annex 2 Guidelines for development of groundwater scenarios**

- 1- decide on 80+80=90% or 90+90=99%
  - 2- check whether few hundred soil profiles are available
  - 3- agree on best division of China into climatic zones (considering pesticide registration and agricultural considerations)
  - 4- collect information on yearly irrigation amounts for each crop/zone combination (for only a few crops if too much work)
  - 5- collect information on crop parameters for each crop/zone combination (for only a few crops if too much work; see FOCUS groundwater report for format)
  - 6- select three 80 or 90th percentile soil locations for each zone for rice
  - 7- select three 80 or 90th percentile soil locations for each zone for agriculture
  - 8- select three 80 or 90th percentile soil locations for each zone for forest
  - 9- collect information on annual water percolation losses for rice in each zone
  - 10- select three meteostations with average rainfall for each zone for agriculture
  - 11- select three meteostations with average rainfall for each zone for forest
  - 12- select optimal soil-meteo combinations for each zone for agriculture
  - 13- select optimal soil-meteo combinations for each zone for forest
- Priority for northern climatic zones: agriculture → rice → forest  
Priority for southern climatic zones: rice → agriculture → forest
- 14- collect soil profile data for optimal soil locations (see FOCUS groundwater report for format)
  - 15- make complete 20-year meteorological input file for PEARL model for optimal meteostations (start with selecting estimation methods for global radiation; see PEARL input file for format)
  - 16- collect information on abstraction depths and abstraction rates (m<sup>3</sup>/year) for drinking water

Priorities: 1 (decide 80+80=90), 3 (division into zones)

Then: try to develop one scenario completely (facing all possible difficulties), later more scenarios

## **Annex 3 Guidelines for development of surface water scenarios**

- 1- develop/select estimation of spray drift from knapsack sprayers
- 2- collect 50th and 80th percentiles of yearly daily max rainfall amounts from relevant meteorological stations
- 3- collect spatial information on slopes
- 4- collect information on frequency of ditches/streams with large densities of plants
- 5- agree which risk mitigation measures would be acceptable for pesticide registration
- 6- collect spatial structure of 3-5 typical surface water networks (from the individual field level and up to where the protection goal starts); output via map or via photograph; check protection goal definition
- 7- set priorities for scenario development for each climatic zone (rice/agriculture/forest dominated catchments)

Priorities: 6, 1 (spray drift), 2 (daily max rainfall statistics)