Pesticide Risk Reduction Programme – Ethiopia

Surface water protection goals

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joint collaborative programme on pesticide registration and post-registration

MoA

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FIAT PANIS

Towards a sustainable use of pesticides in Africa

Definition of protection goals

Outline

- Introduction to protection goals

- Stepped approach, now results of:
  - Define and describe options for protection goals: select and prioritise
  - Design conceptual models for protection goals

Definition of protection goals

How to define protection goals into detail ?

Answer questions:

- What do you want to protect ?

- Where ?

- When and how strict ?

Definition of protection goals

Why is definition of protection goals important?

If protection goals have been defined into detail
we know which exposure concentrations we need to assess, so
we can design scenarios

Example:
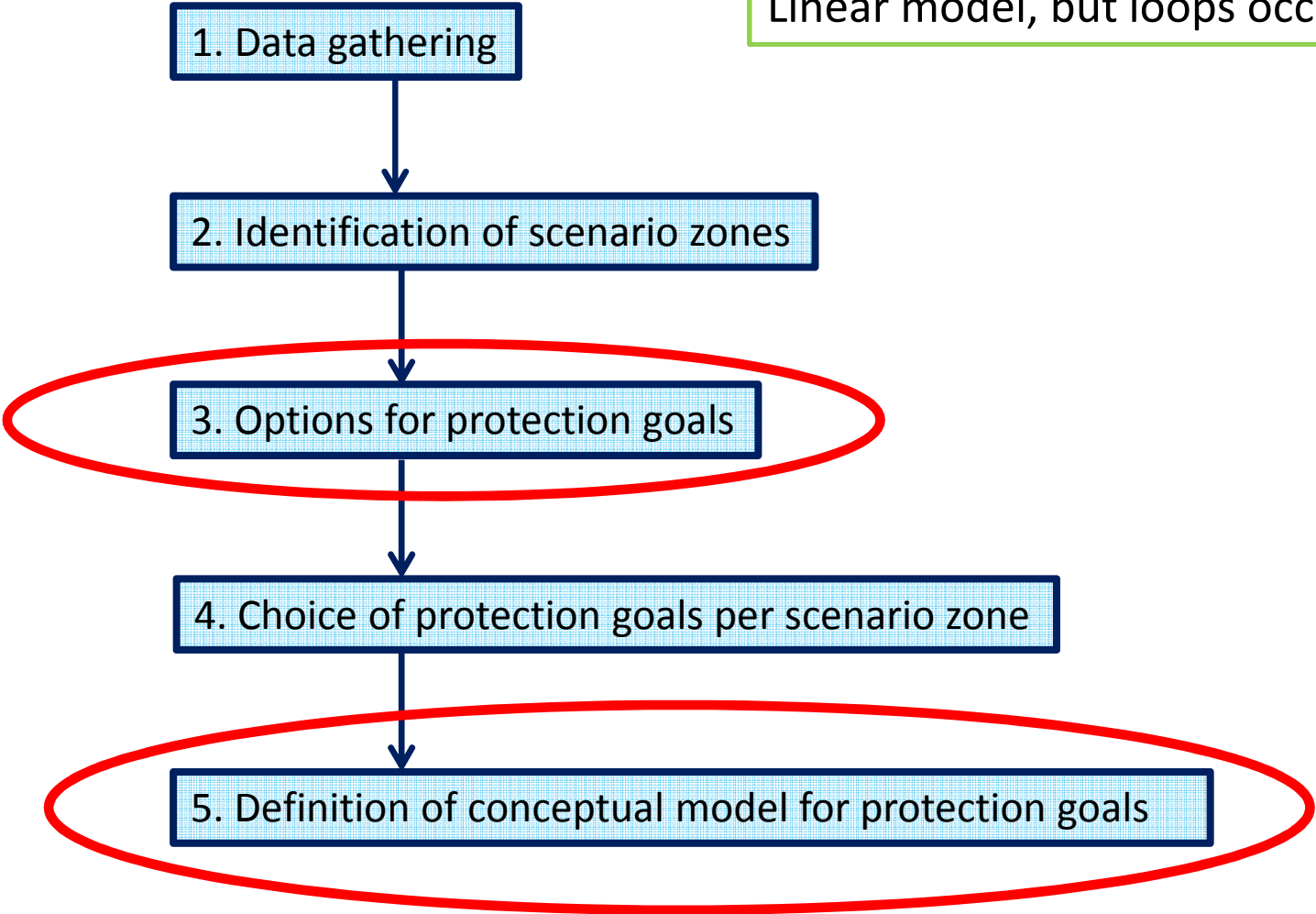
Protection goal for aquatic ecosystem:

no immediate effects are accepted in field ditches

Required exposure scenario:

peak concentration of dissolved pesticide in water of field ditches

Definition of protection goals
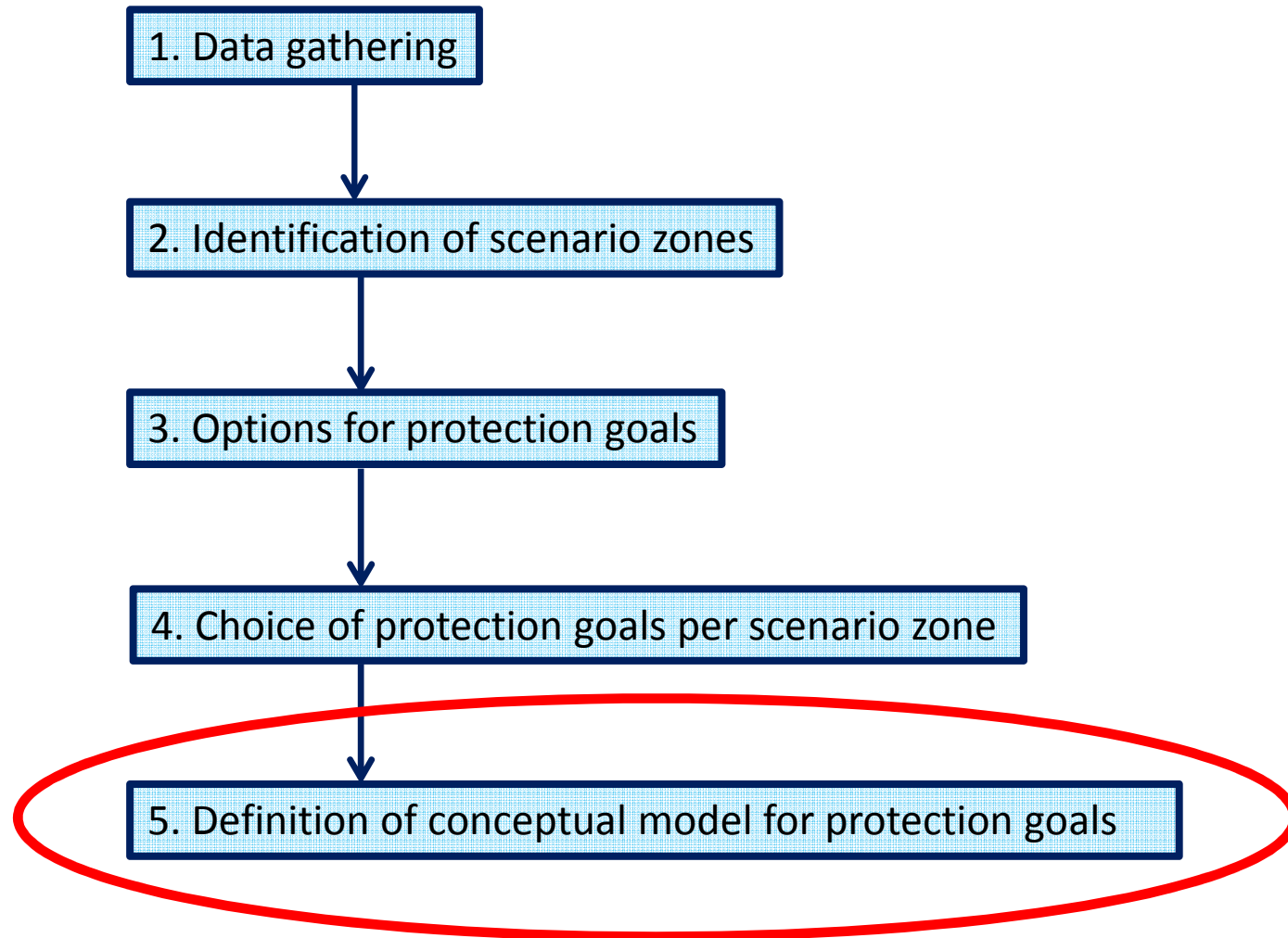
Linear model, but loops occur !

1. Data gathering

2. Identification of scenario zones

3. Options for protection goals

4. Choice of protection goals per scenario zone

5. Definition of conceptual model for protection goals

Definition of protection goals: results

PG	1st	2nd	3rd	4th	5th
Ground water	-	2		3	1
Surface water	10	-	-	-	-
Aquatic ecosystem	-	2	2	-	1
Soil ecosystem	-	6	2	1	-
Terrestrial ecosystem	-	-	6	2	

- First priority to protect is surface water
  (6 conceptual models in relevant
    scenario zones)

- Add one scenario for greenhouses

Definition of protection goals

1. Data gathering

↓

2. Identification of scenario zones

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3. Options for protection goals

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4. Choice of protection goals per scenario zone

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5. Definition of conceptual model for protection goals

Definition of protection goals: steps in detail

> 5. Definition of conceptual model for protection goals

- Define conceptual model for each protection goal
- Start with conceptual models for 2-4 highest priority goals

- Conceptual model should contain all information relevant for determining the exposure
- Consists of a picture/drawing plus description

Definition of protection goals: steps in detail

- If two fundamentally different situations exist for one protection goal, and it is a priori not evident which situation is the 'realistic worst case', then it may be necessary to design two conceptual models

  – e.g. surface water for drinking water from river, but also from lake with nearby intensive horticulture -> two lay outs needed
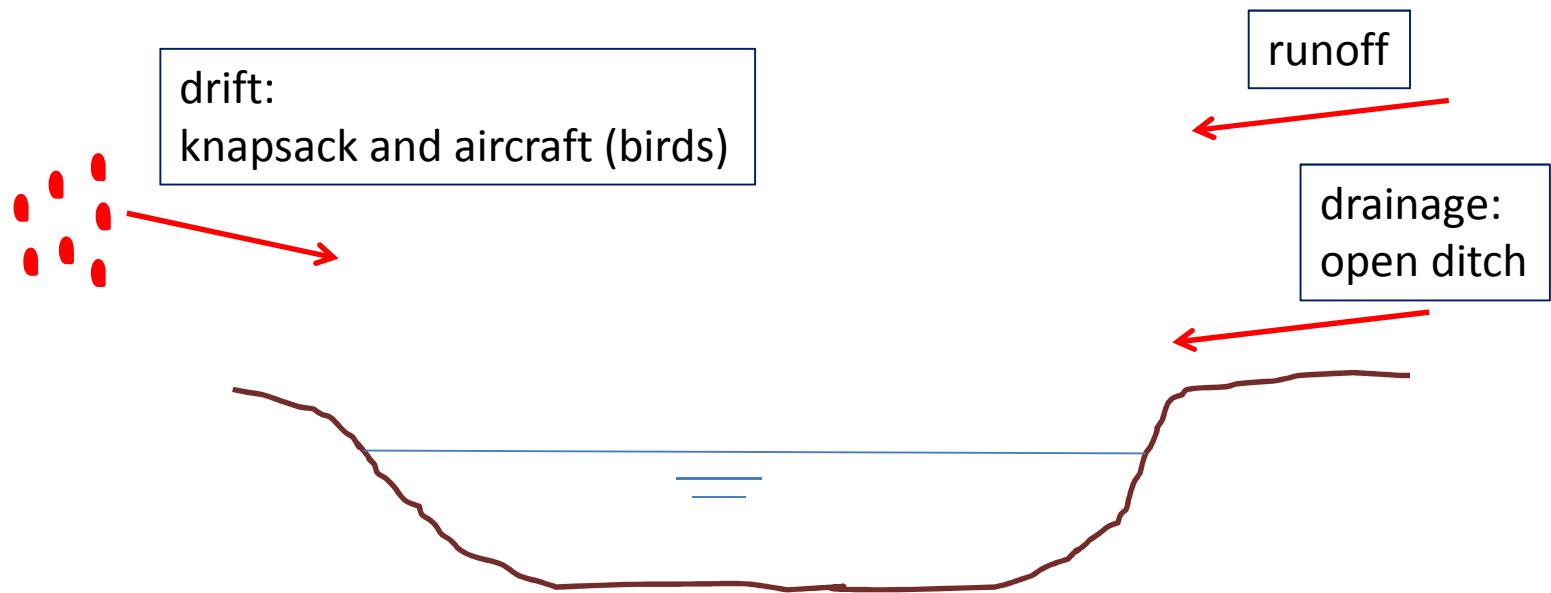
Protection goals: surface water

Elements conceptual model:

1. Details protection goal (drinking water for man or cattle, until when, irrigation water, aquatic ecosystem, exact patch/stretch to protect ?)
2. Entry routes (drift, runoff , drainage)
3. For drift:
   # application techniques,
   # distance crops-edge of water
4. Size water body (l * w * d, dynamics)
5. Size contributing area
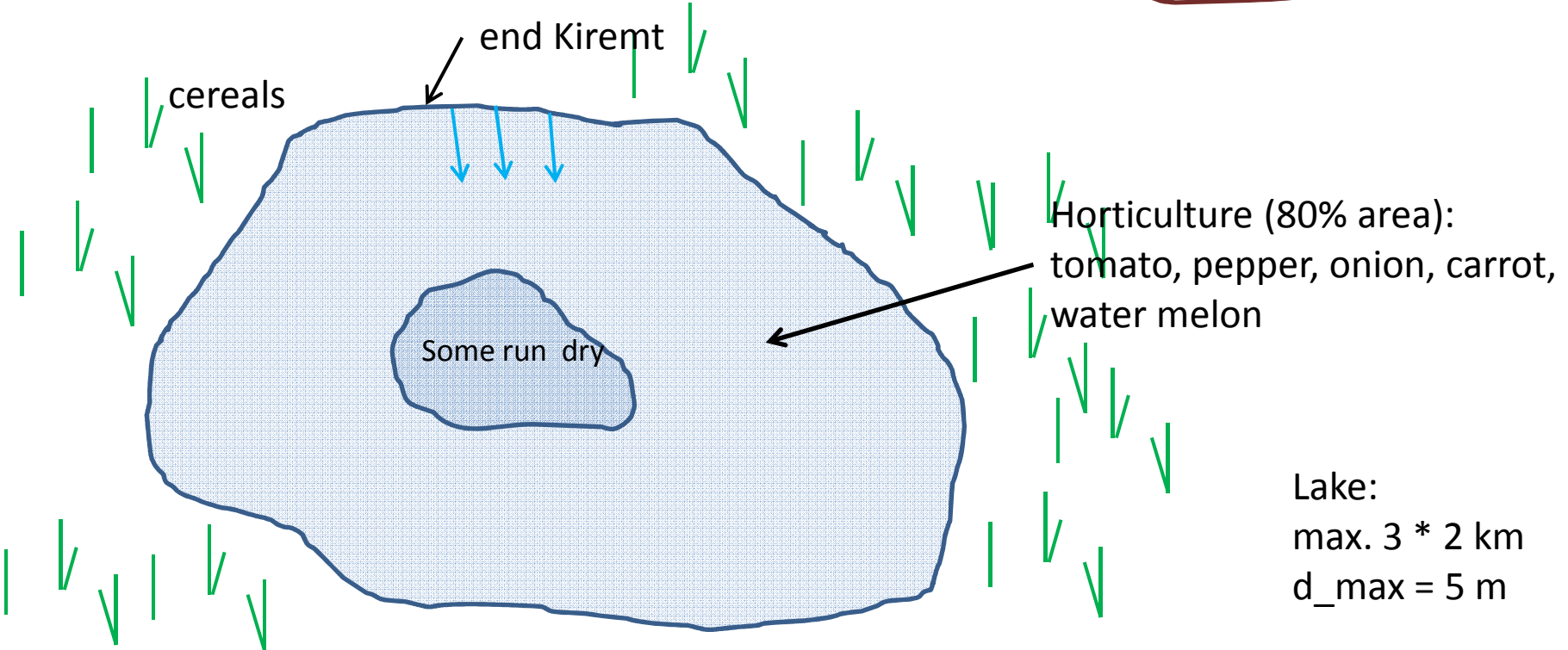6. Crops and treatment ratio of contributing area
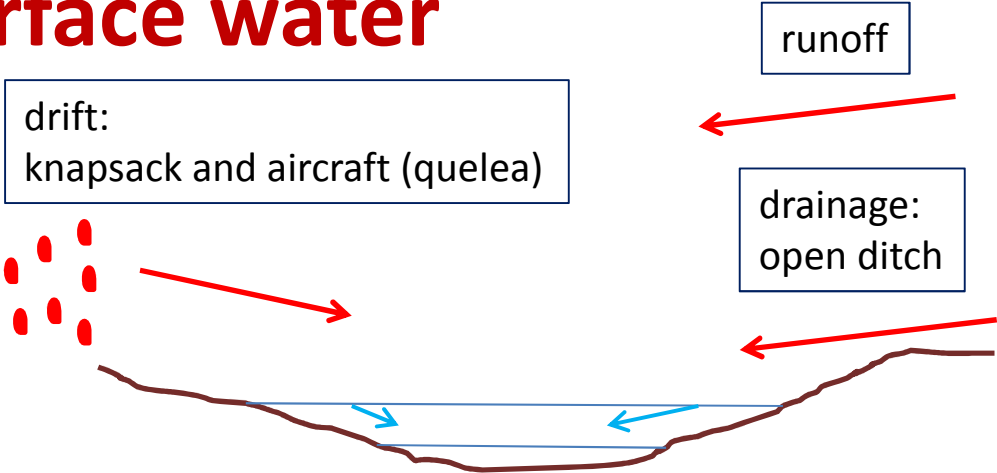
Protection goals: surface water

1. Rift Valley lakes

- Drinking water for man and cattle

- E.g. lake Ziway, lake Nagano, select smallest lake

drift:
knapsack and aircraft (birds)

runoff

drainage:
open ditch

Protection goals: surface water

2. Temporary lakes/ponds/swamp

Koka area,
southern areas: sand filters->men drinking
- Drinking water for cattle (until dry)
- Horticulture (irrigation with pumps)

- Start after Kiremt rains until dried up
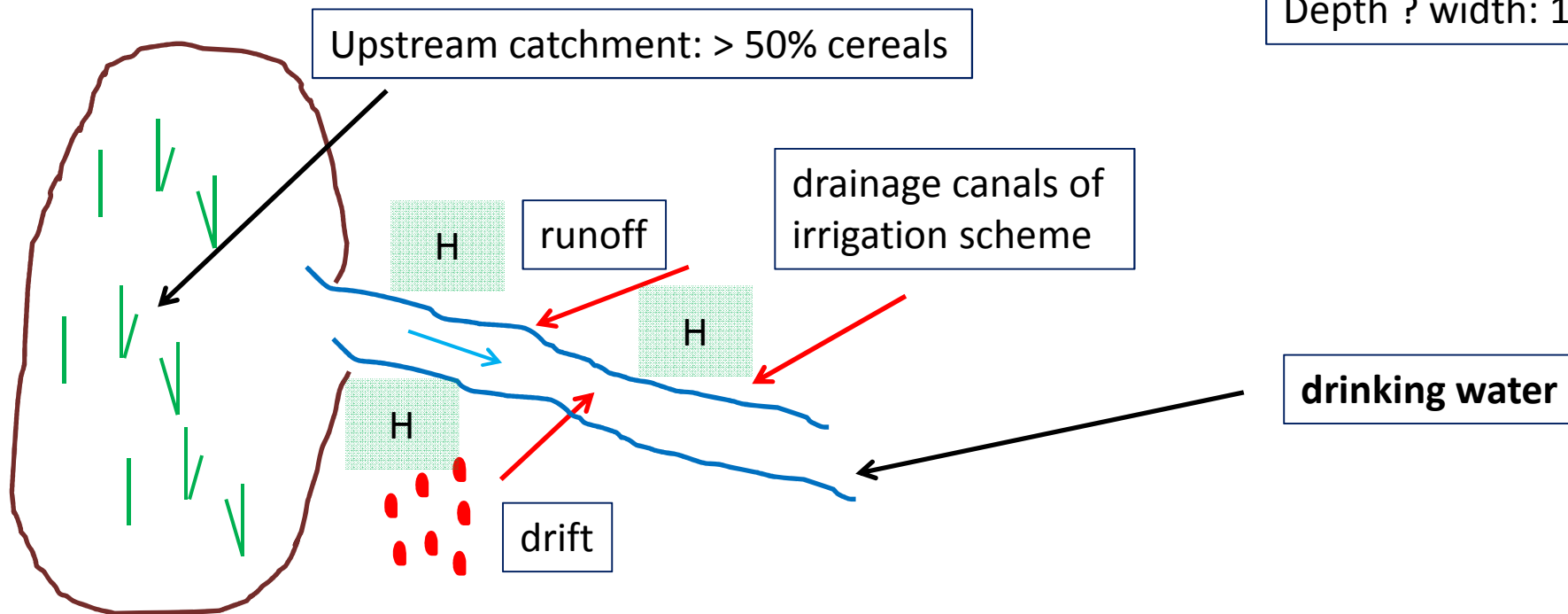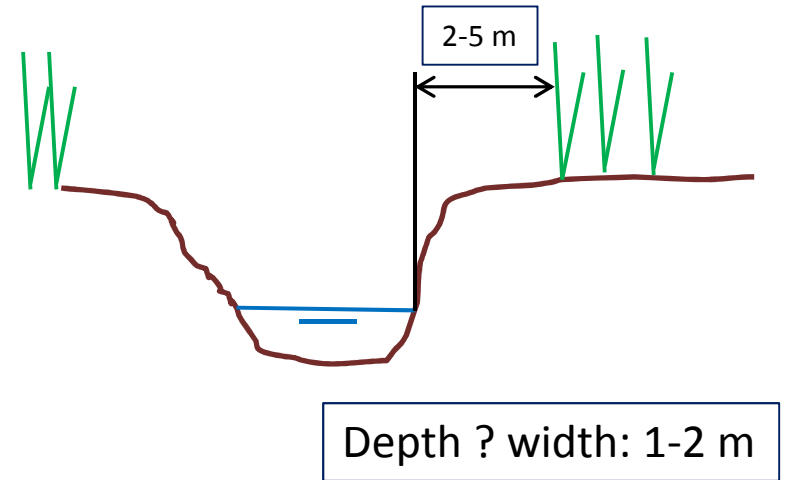- E.g. Koka area (swamp),
  in Rift Valley

runoff

drift:
knapsack and aircraft (quelea)

drainage:
open ditch

end Kiremt

cereals

Some run dry

Horticulture (80% area):
tomato, pepper, onion, carrot,
water melon

Lake:
max. 3 * 2 km
d_max = 5 m

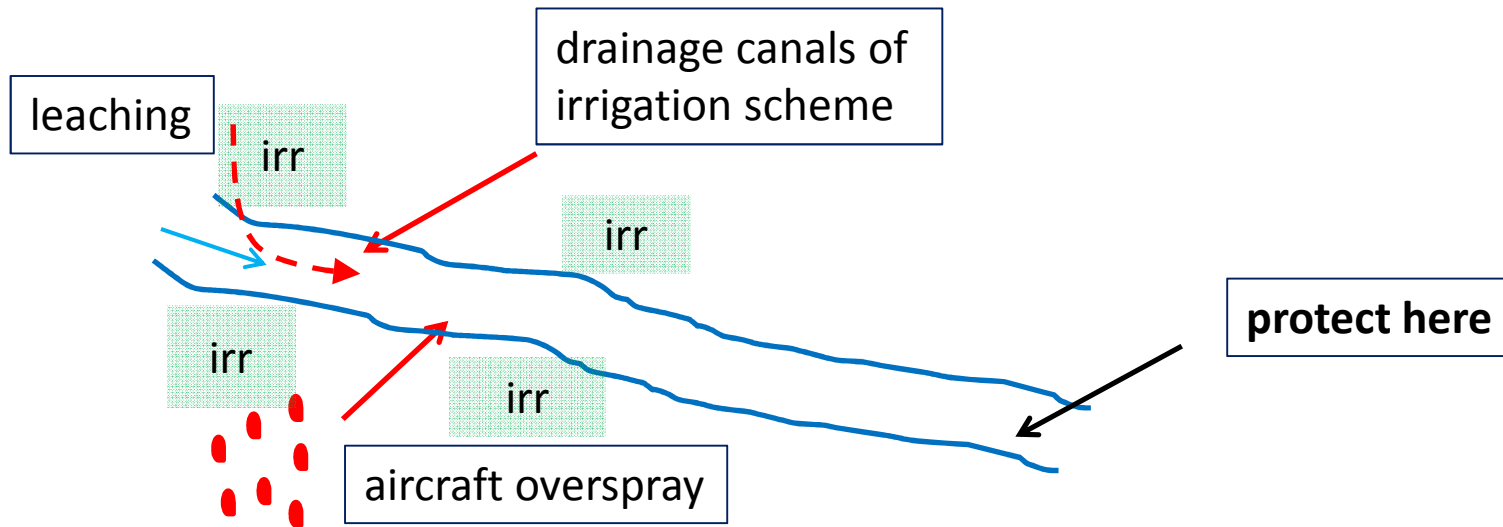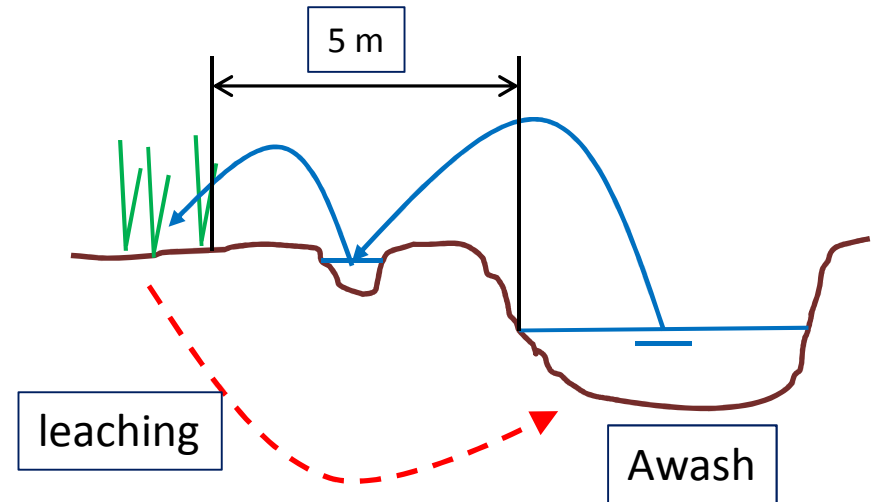# Protection goals: surface water

3. Stream/small rivers

- Drinking water (villages) until depleted (just before Kiremt, horticulture still done)
- Drinking water for cattle
- Irrigation of horticulture (H)

2-5 m

Depth ? width: 1-2 m

Upstream catchment: > 50% cereals

runoff

drainage canals of irrigation scheme

H

H

H

drinking water

drift

Protection goals: surface water

4. River Awash (main river)
- Downstream end of large scale agricultural area (cotton, sugarcane in NE site)
- Drinking water for man ?, cattle ?
- Irrigation downstream ?

Protection goals: surface water

5. Storage reservoir
   (e.g. near Addis)

- Drinking water supply for towns
- Agriculture (cereals by smallholders), grassland, forest in catchment
- Even flower farm in catchment (22 ha greenhouse, total, 30 ha, near Addis)

Catchment

reservoir

Fence

Dimensions:
l*w*d ??
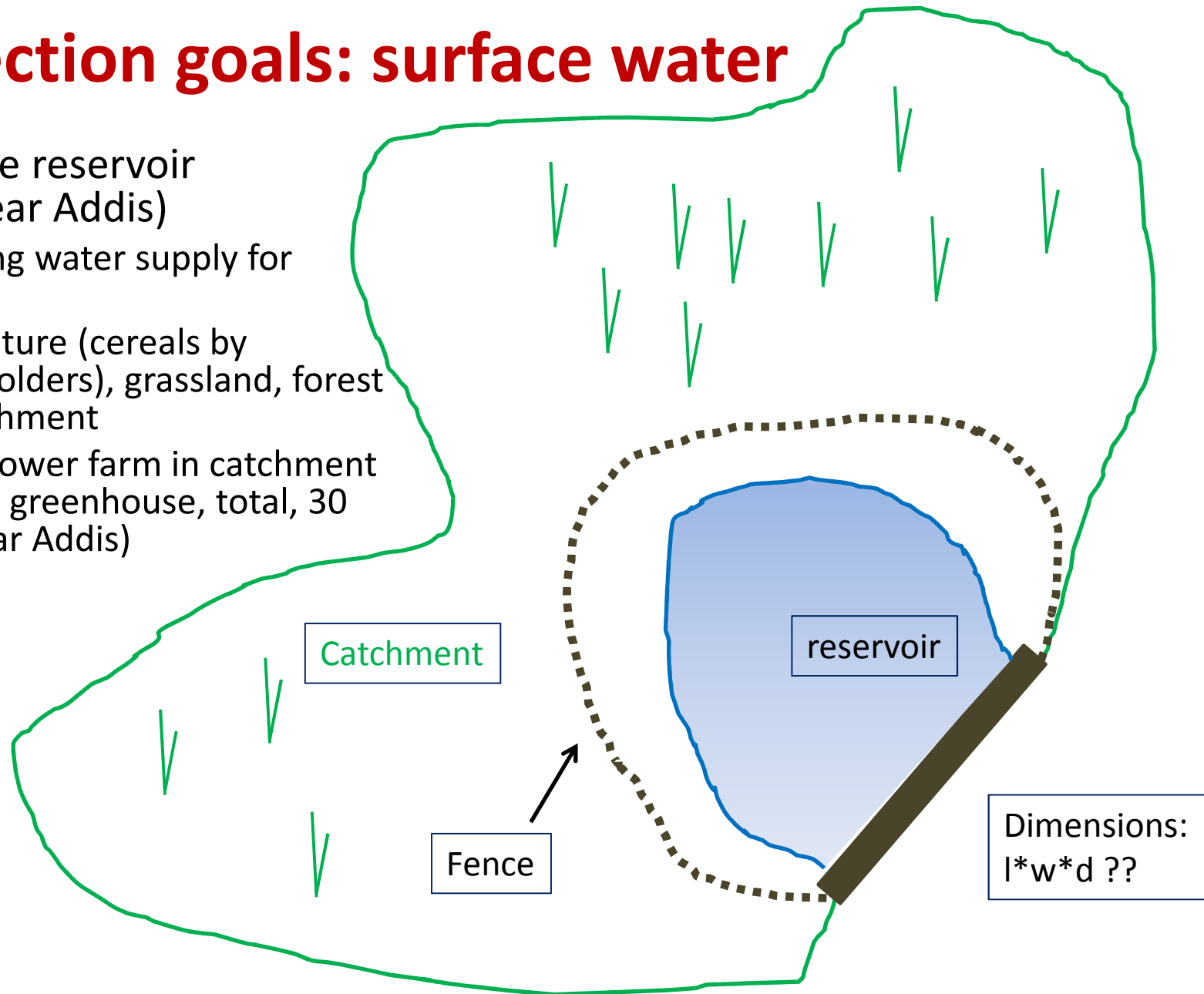
Protection goals: surface water

6. Tributaries of Awash, Blue Nile etc

- Some run dry, some permanent
- Teff areas, no irrigation
- Drinking water for man and cattle
- Irrigation downstream ?

10 m

tributary

Depth ? width: 1-2 m

drift by knapsack, no aircraft

teff

teff

teff

runoff
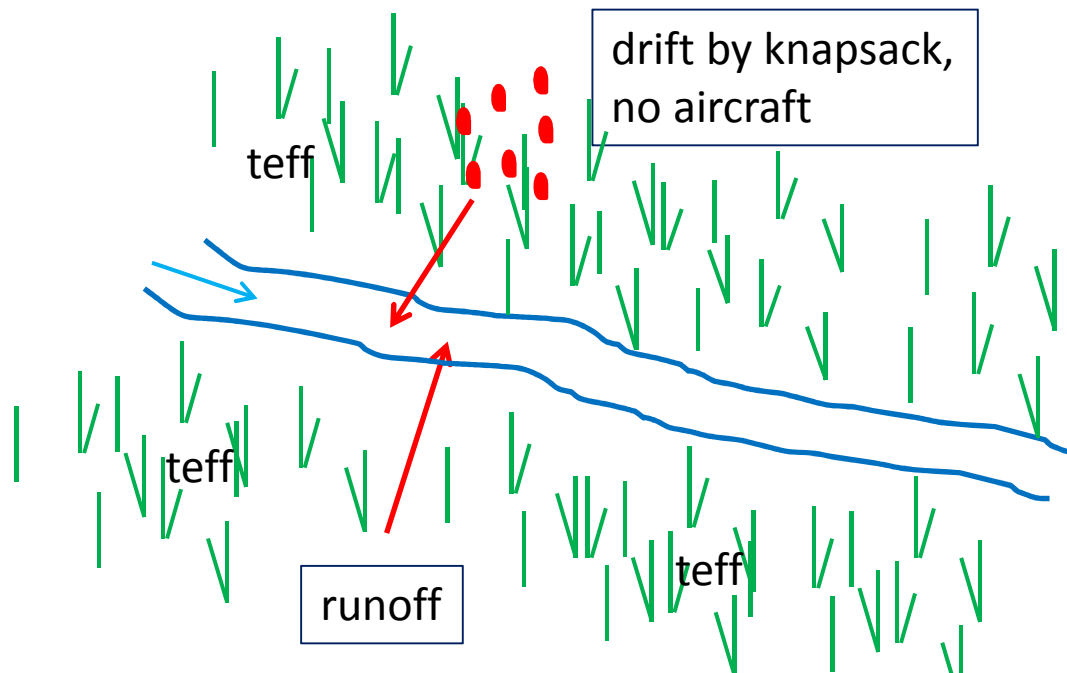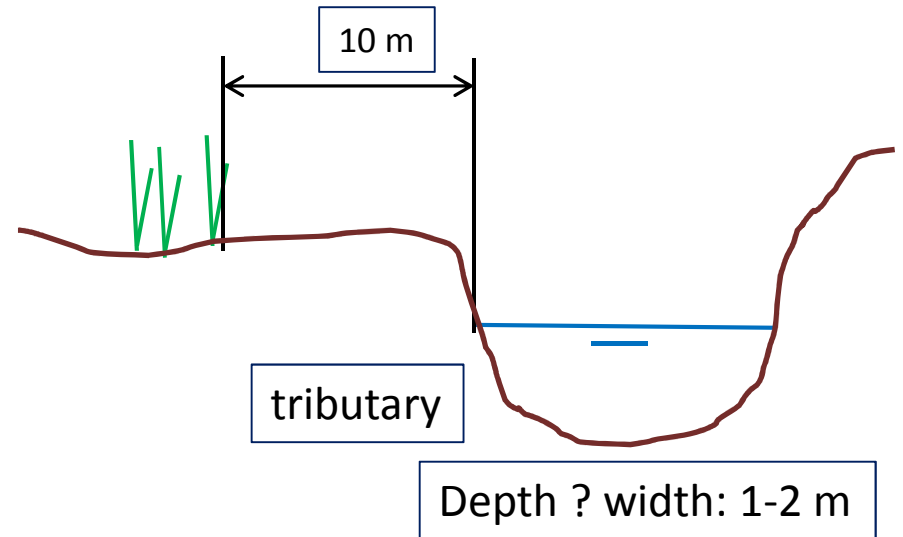
Rotation

- teff (2-4D, weed control)
- pulses (bolworm, aphids)
- wheat/maize (....)
- oil seeds (-)

All in Kiremt

Protection goals: surface water

- We need set priorities, so limit number of protection goals for which we can work out the scenarios

- Proposal: take 2 most vulnerable goals, i.e. where we expect the highest concentrations

Proposal

1. River type: stream/small river near villages, #3 entire Ethiopia (vulnerable+widespread)
2. Pond/lake type: temporary pond, #2 (cattle drinking) Rift Valley, east Ethiopia (most vulnerable)

Definition of protection goals: next steps
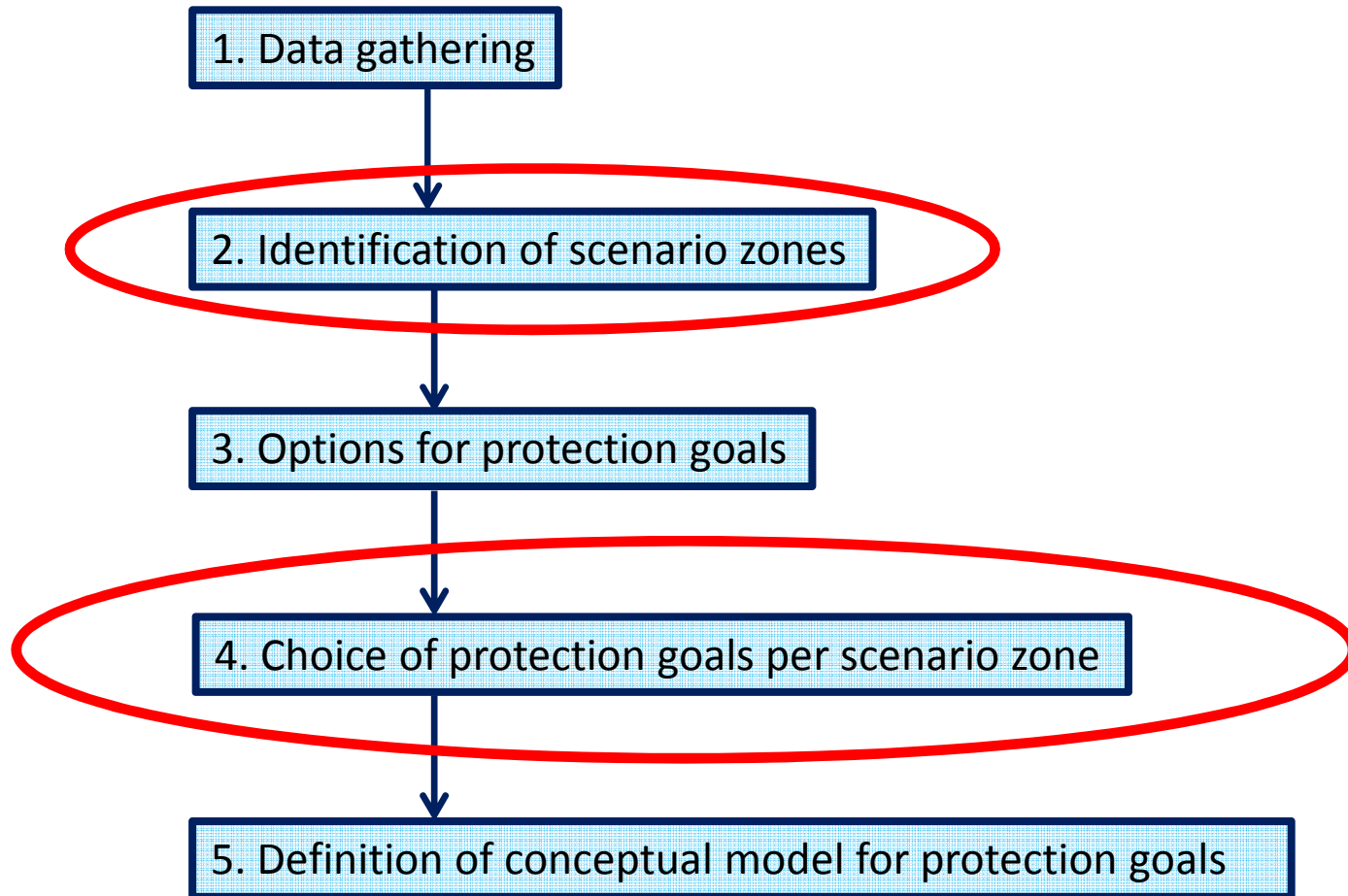
Definition of sw protection goals