

# WHO Guidance on the Protection of Drinking-water Resources

*Why and What ?*

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# *Guidance document*

„Protecting Groundwater for Health:  
Managing the Quality of Drinking-water Sources“

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# *Points of departure (1)*

## Key approaches taken within the revision of WHO Guidelines for Drinking-water Quality

- Introduction of quality management principles: Hazard Assessment and Critical Control Points (HACCP)
- Assessment of whole drinking-water supply chain from „catchment to consumer“

## *Points of departure (2)*

- Importance of resource protection as the first barrier in a multi-barrier-approach
- Importance of groundwater as drinking water source: recognition ("hidden-sea-phenomenon") and time scales
- Need for empowering the public health sector for participation in the inter-sectoral process of groundwater resource management

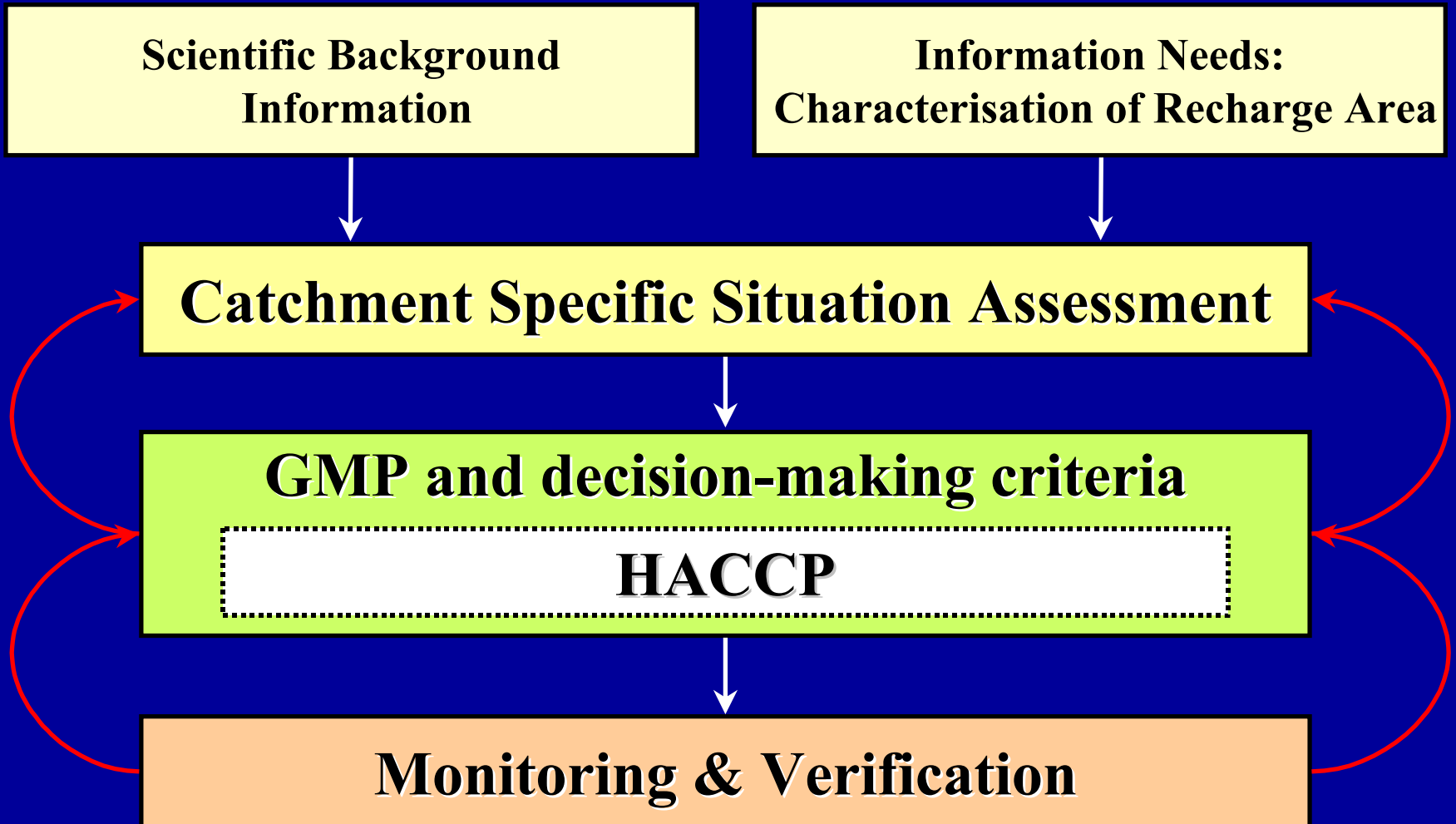
# *Intention*

## **Health angle !**

Protection of groundwater resources as a health concern

- Provision of guidance and introduction of HACCP principles
- Development of the important interface between environment and health
- Focus on groundwater quality only: pathogens and chemicals ("disease agents")

# *General concept*



# *Section I*

## **Scientific background information**

- Groundwater system: hydrological and hydrogeological processes
- Health relevance, transport and attenuation of pathogens and chemicals in the subsurface
- Naturally occurring constituents

## ***Section II***

### **Information needs for the characterisation and assessment of the catchment environment**

- Provision of basic understanding for current or past human activities and their potential pollutants
- Socio-economic and institutional conditions
- Guidance on type of information needed for assessing potential of groundwater contamination (checklists)
- Guidance on how to compile information (checklists)
- Guidance on situation assessment



# *Section III*

## **Management approaches**

- Aspects of policy and law frameworks, enforcement, institutional capacity building and public participation
- Guidance on general protection concepts (protection zones, wellhead protection)
- Guidance on good management practices (GMP) for avoiding groundwater contamination from specific human activities
- Introduction of HACCP principles and guidance on identification of relevant critical control points (CCPs)

# *What is HACCP ?*

## **Hazard Analysis and Critical Control Points**

- Scientific, systematic and transparent management tool to identify and control threats to public health via drinking-water
- Preventative and uniform approach applicable for the whole drinking-water supply chain from catchment to consumer
- Tool for controlling processes in the drinking-water supply chain

# *HACCP principles (1)*

## **Principle I**

Identify the threat to public health



## **Step 1**

Hazard analysis and assessment by the HACCP team

## Prerequisite

Multi-disciplinary HACCP team

# *HACCP principles (2)*

## **Principle II**

Identify means for control



### **Step 2**

Determination of Critical Control Points (CCPs)



### **Step 3**

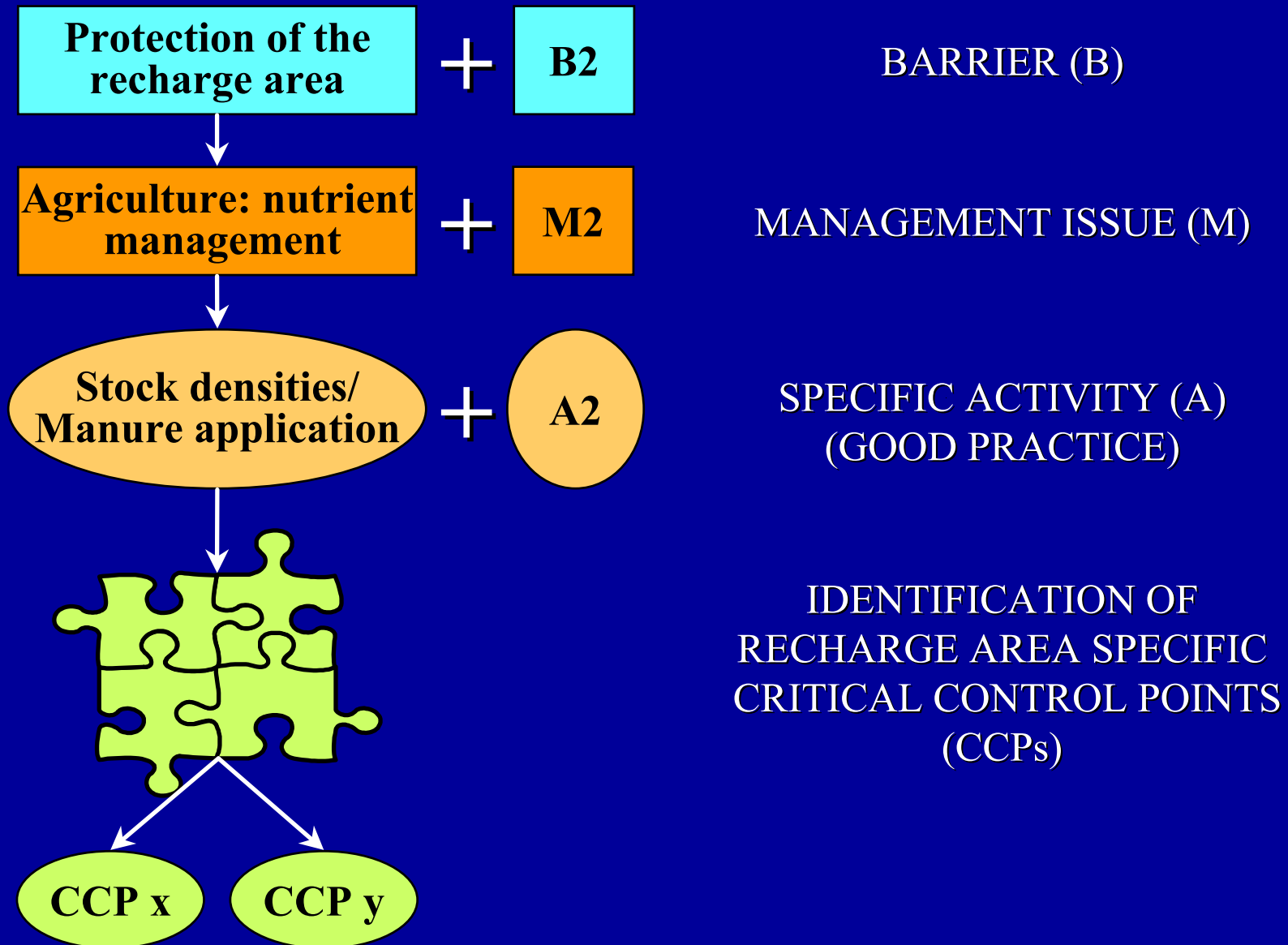
Specification of critical limits



### **Step 4**

Establishment of a monitoring system

# *Line of thinking*



# *CCPs & Good practice*



CCP

**Good Hygiene  
Practice**

**Good Manufact.  
Practice**

- ✘ HACCP does not replace good codes of practice but build on them
- ✘ Criteria for identifying CCPs:
  1. Certain process step is critical to control in a specific supply setting
  2. Monitoring and enforcement of corrective actions in the case of non-compliance are possible

# *CCPs in recharge areas (1)*

<b>Management Issue</b>	<b>Critical Control Point (CCP)</b>	<b>Options for Monitoring</b>
avoiding disease agents from <b>any human activity</b>	drinking-water protection zone	periodic site inspection
avoiding disease agents from <b>hazardous chemicals</b>	containment during transport and storage	regular inspection of containments
avoiding disease agents from <b>human excreta</b>	distance between latrines and wells	regular site inspection
avoiding disease agents from <b>human excreta</b>	leakage from sewers	regular inspection of sewer condition
avoiding disease agents from <b>agriculture</b>	stock density adequate for local soil/hydrological conditions	control of farm book-keeping, site inspection
avoiding disease agents from <b>agriculture</b>	fertiliser application adequate for local soil/hydrological conditions	control of farm nutrient management plan

# *HACCP principles (3)*

## **Principle III**

Ensure control is properly exercised



## **Step 5**

Execution of corrective actions



## **Step 6**

Verification of the system



## **Step 7**

Record keeping



## *CCPs in recharge areas (2)*

- No single operational or technical internal process but accumulation of different activities
- No single owner of facilities but many different independent players
- Time scale of groundwater pollution