

# TO A CLIMATE RESILIENT LOWLAND STREAM VALLEY

## WHY?

Large parts of stream basins are under intensive land use. The landscape is 'engineered' to optimise drainage efficiency, but this has undesirable effects on economy, ecology and health.

### WATER QUALITY

Good water quality contributes to an ecologically resilient system, and therefore to a climate-resilient stream valley.

Water quality is under pressure. Intensive land use leads to pollution of streams with pesticides and fertilisers.

Heavy rainfall leads to storm overflows which discharge untreated sewage into the stream.

**Cumulative effect!**

### DROUGHT

Because the rapid discharge of water prevents it from infiltrating into the soil, the water table falls.

To combat the resulting desiccation, crops are irrigated with groundwater. Extracting too much groundwater leads to further drought.

### FLOODING

The rapid discharge in the upper reaches has a cumulative effect downstream, raising peak flows in the lower reaches.

Hard surfacing in urban areas and minimal space for streams hampers the smooth discharge of peak precipitation.

### HEAT STRESS

In urban areas the lack of green space and open water causes rapid increases in temperature and slow cooling.

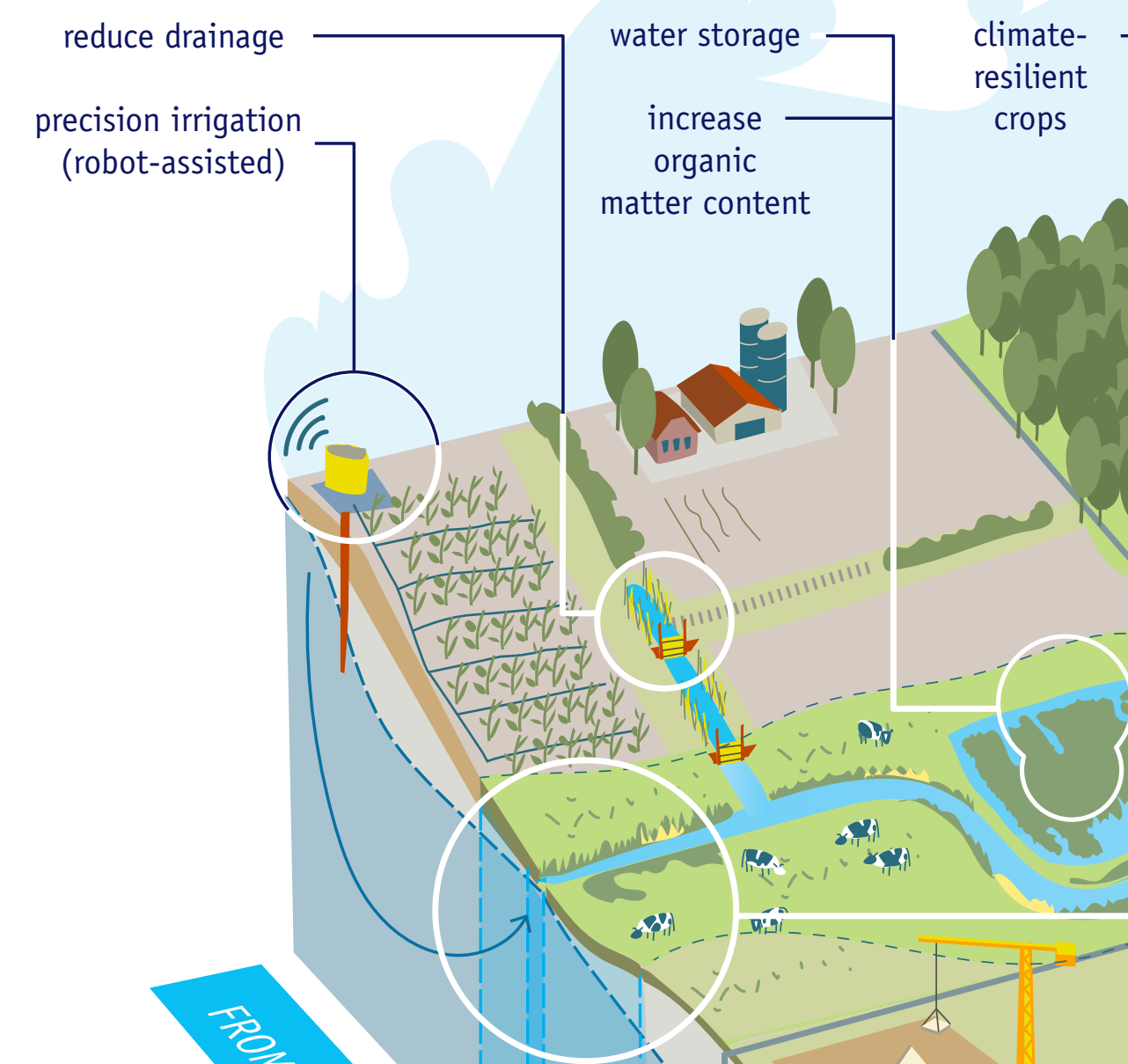
### ECOLOGICAL DAMAGE

The straightening and regulation of streams largely prevents the operation of natural processes and degrades living conditions for plants and animals.



## HOW?

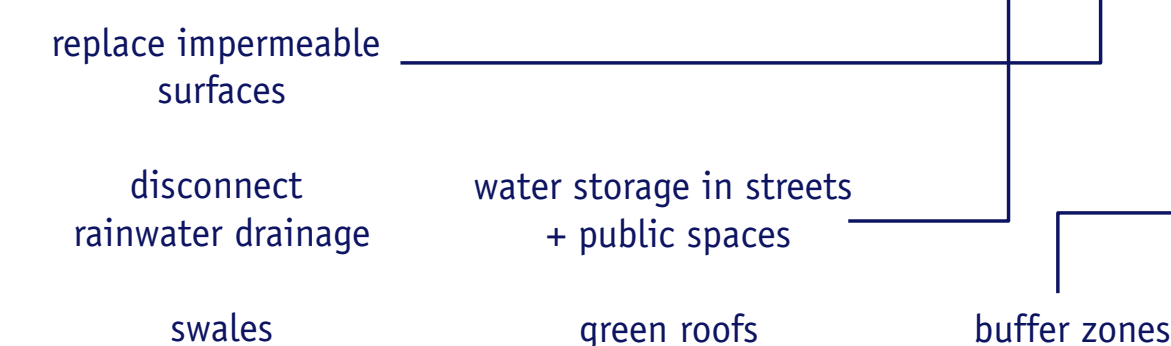
### CLIMATE-RESILIENT AGRICULTURE



### RESTORE THE NATURAL SYSTEM

- reforestation
- fill in ditches
- marshy stream/floodplains
- riparian shading
- remeandering

### CLIMATE-ADAPTIVE CITY



- restoration of groundwater flows
- sustainable soil management
- biological crop protection
- helophyte filters
- near-natural stream cross-section

WATER QUALITY  
IMPROVEMENT



**nature based if possible,  
technical if necessary**

**stowa**

Acronym for FOUNDATION  
FOR APPLIED WATER RESEARCH







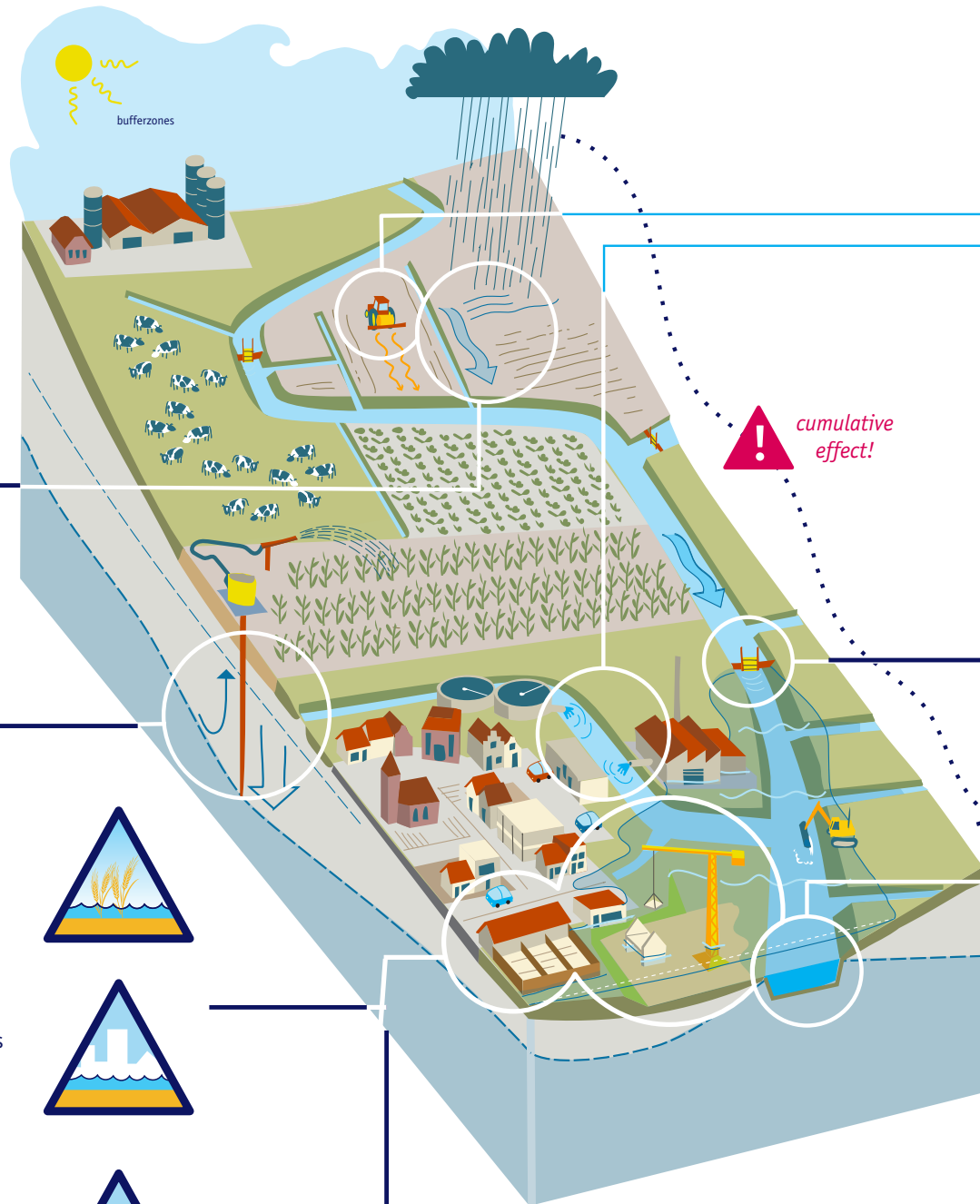
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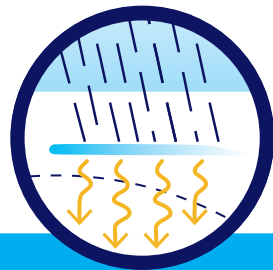
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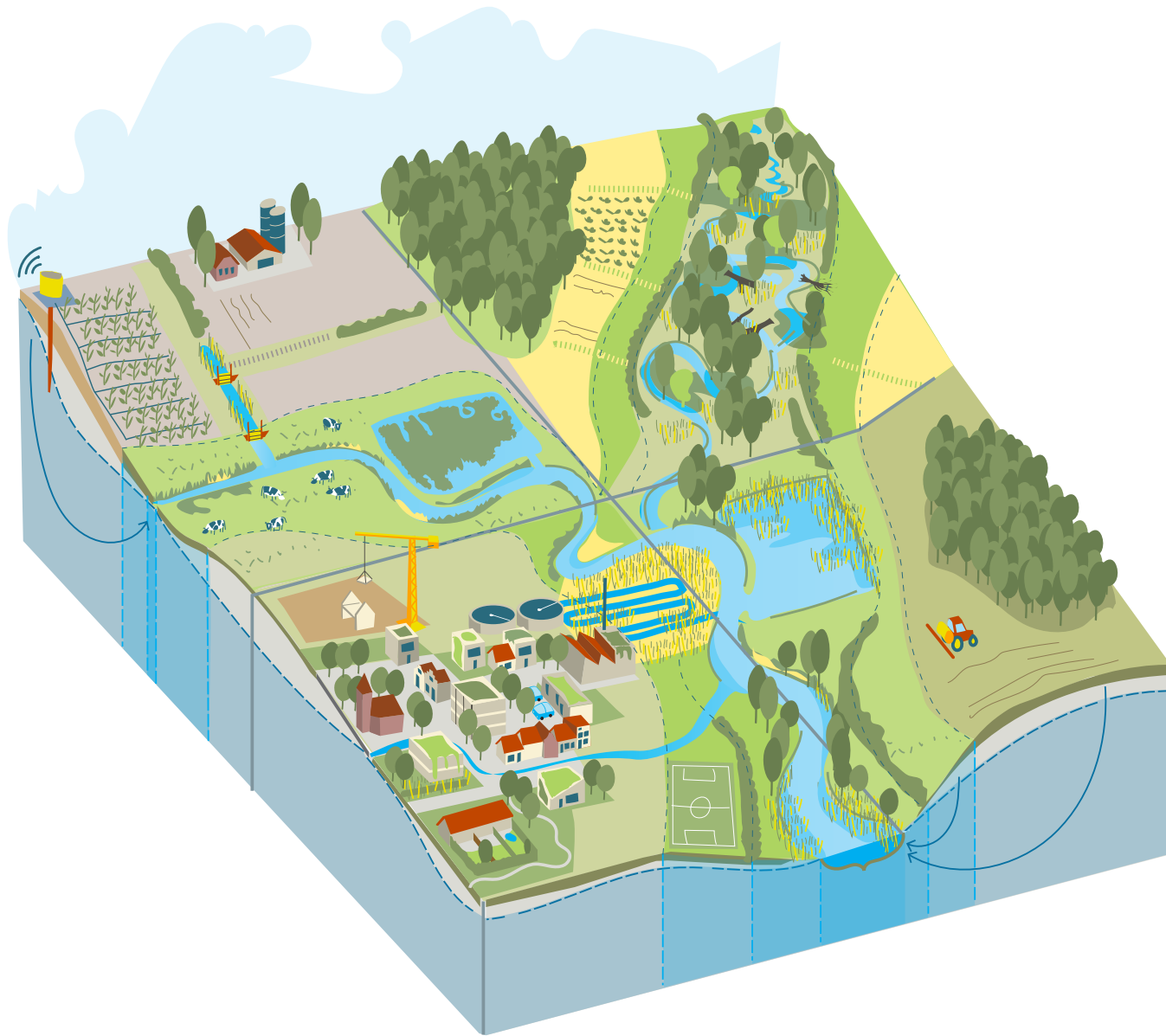
RETAIN



RESTORE

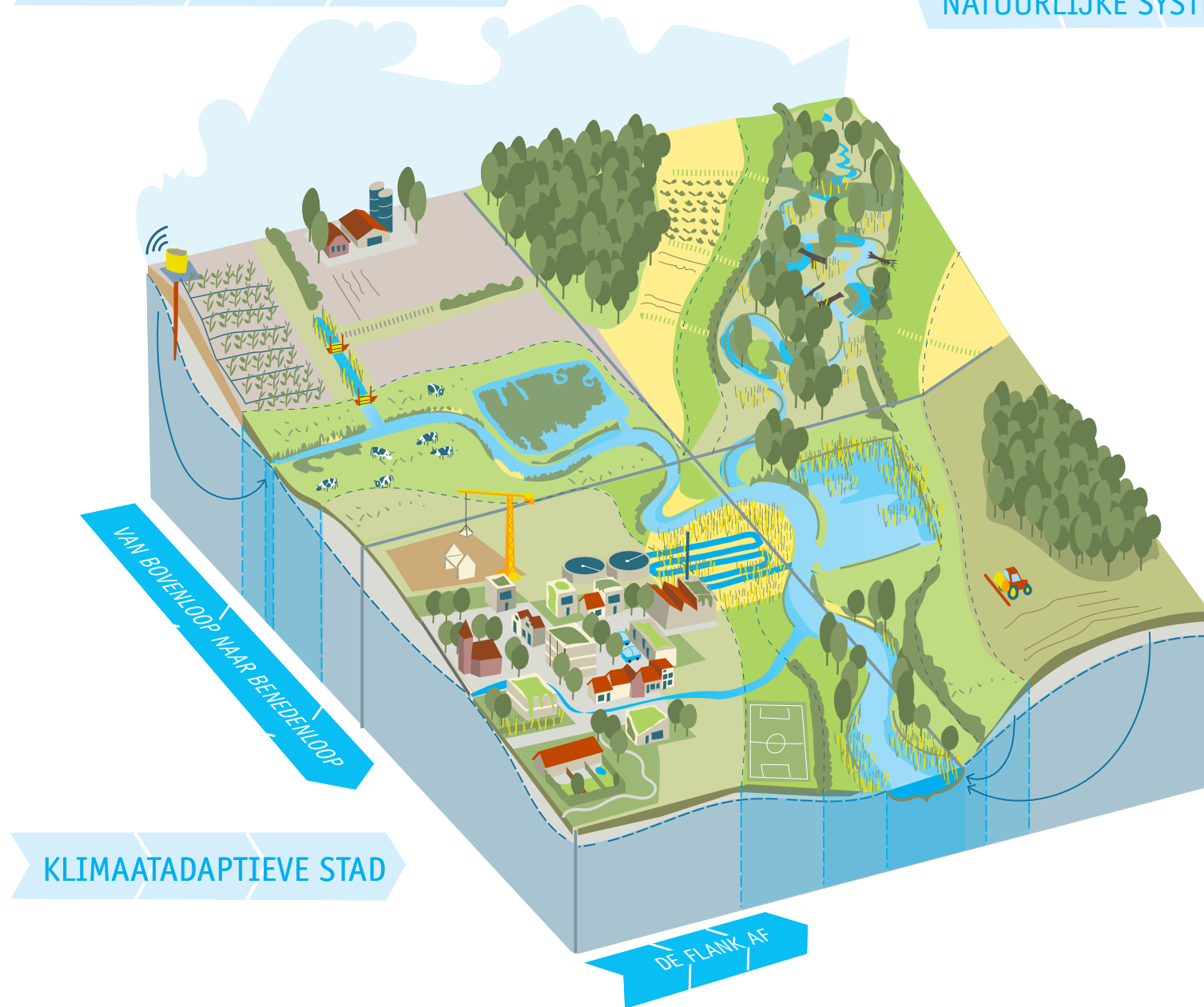


DISCHARGE



KLIMAATBESTENDIGE LANDBOUW

HERSTEL VAN HET  
NATUURLIJKE SYSTEEM

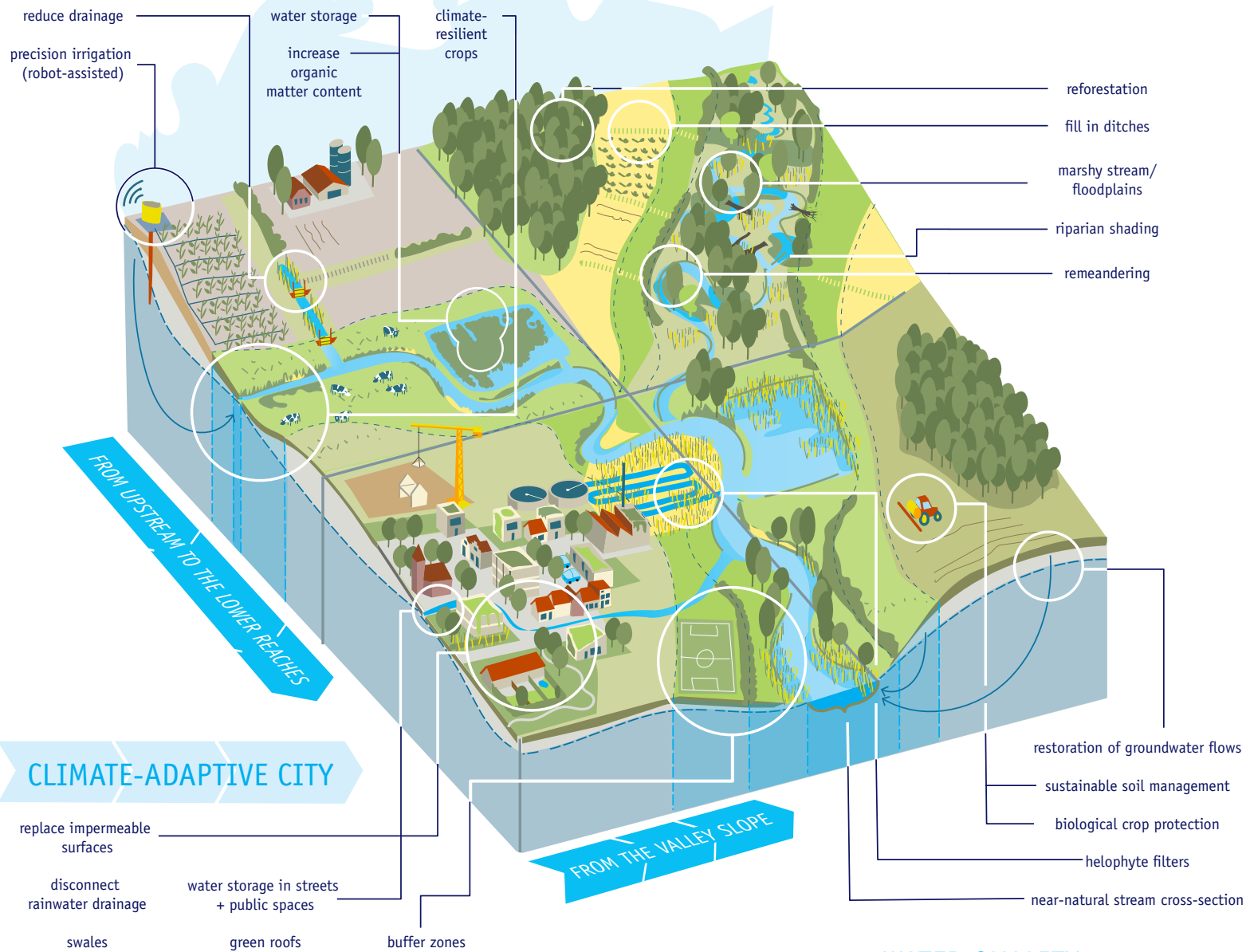


KLIMAATADAPTIEVE STAD

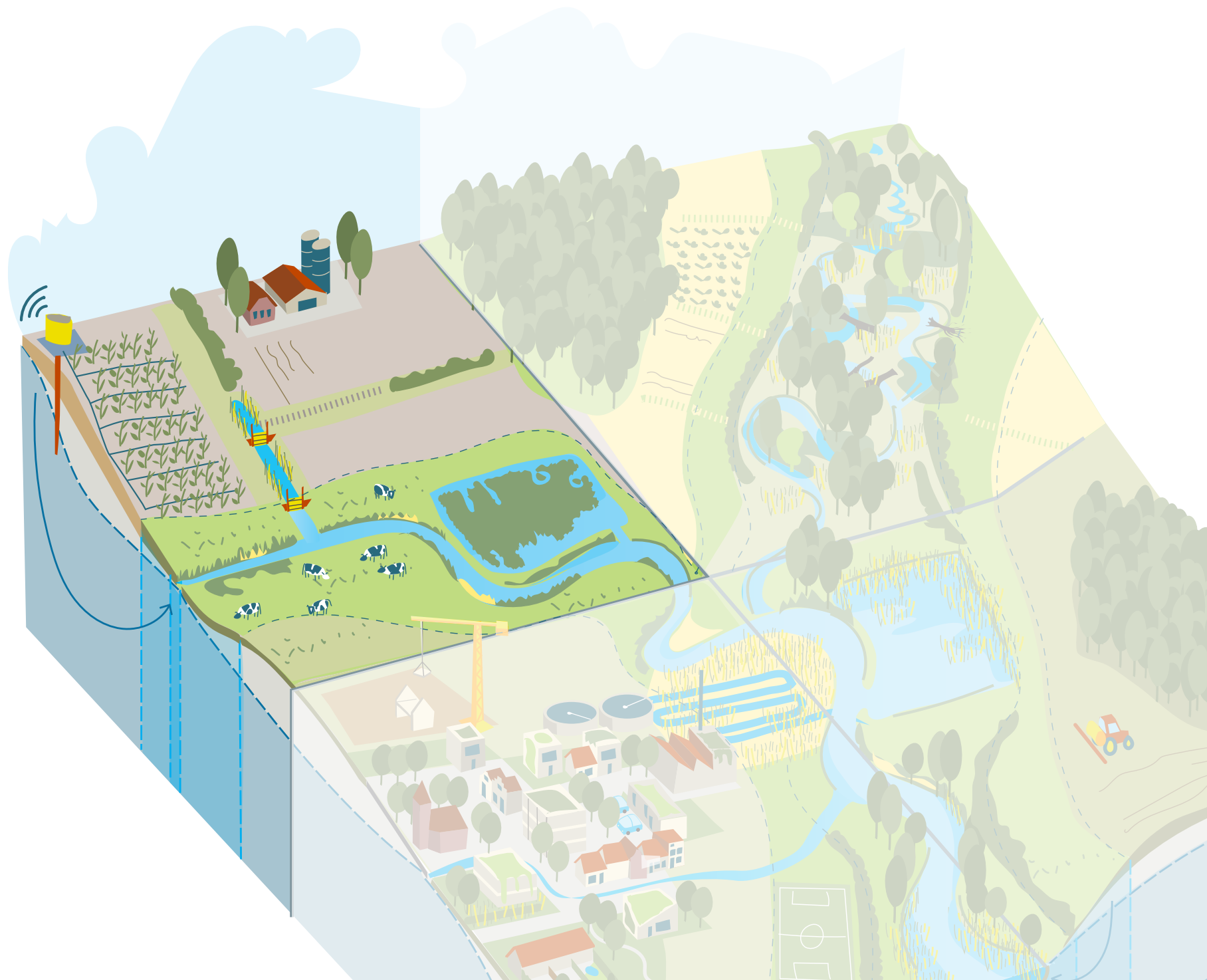
HERSTEL  
WATERKWALITEIT

## CLIMATE-RESILIENT AGRICULTURE

## RESTORE THE NATURAL SYSTEM



## WATER QUALITY IMPROVEMENT

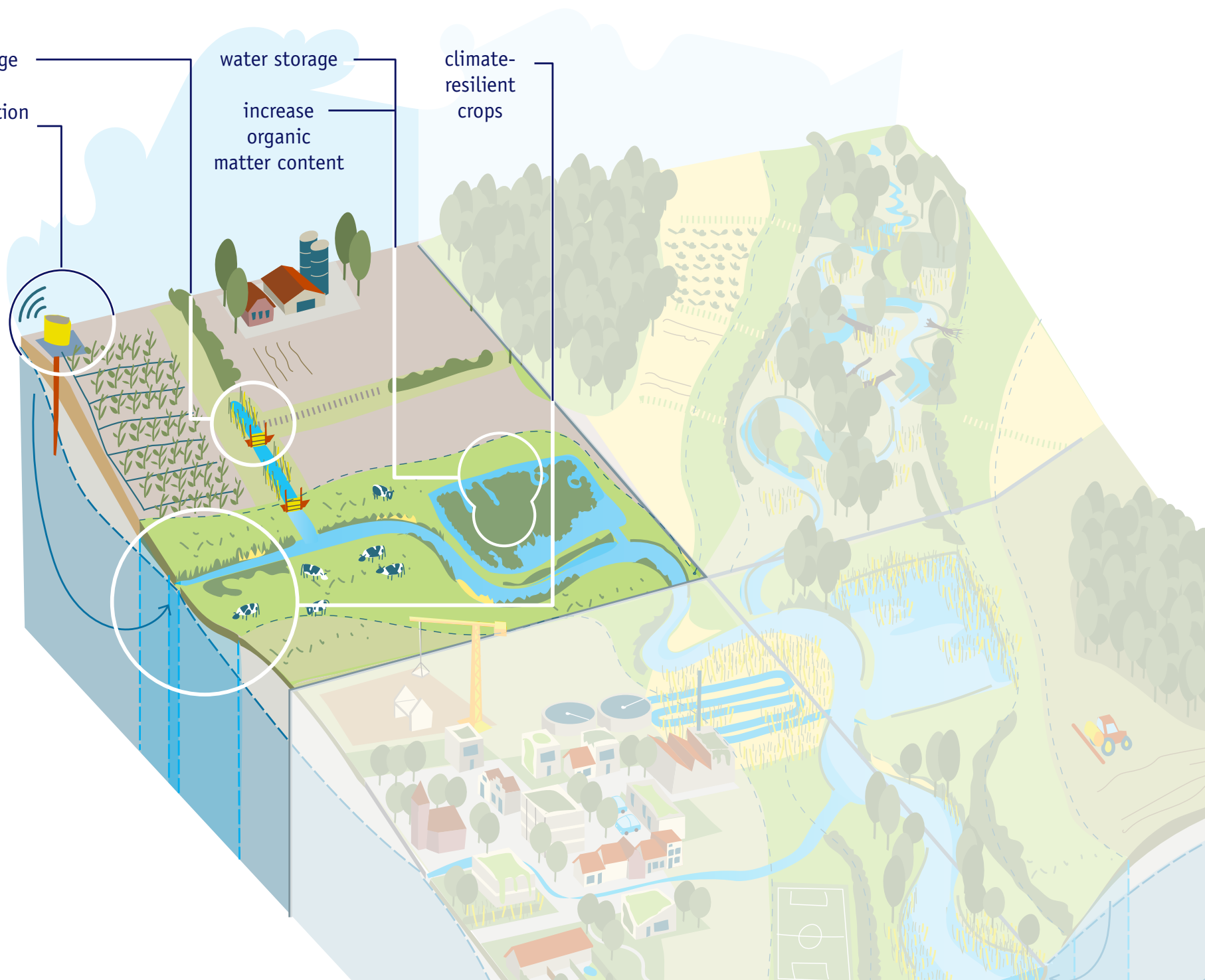




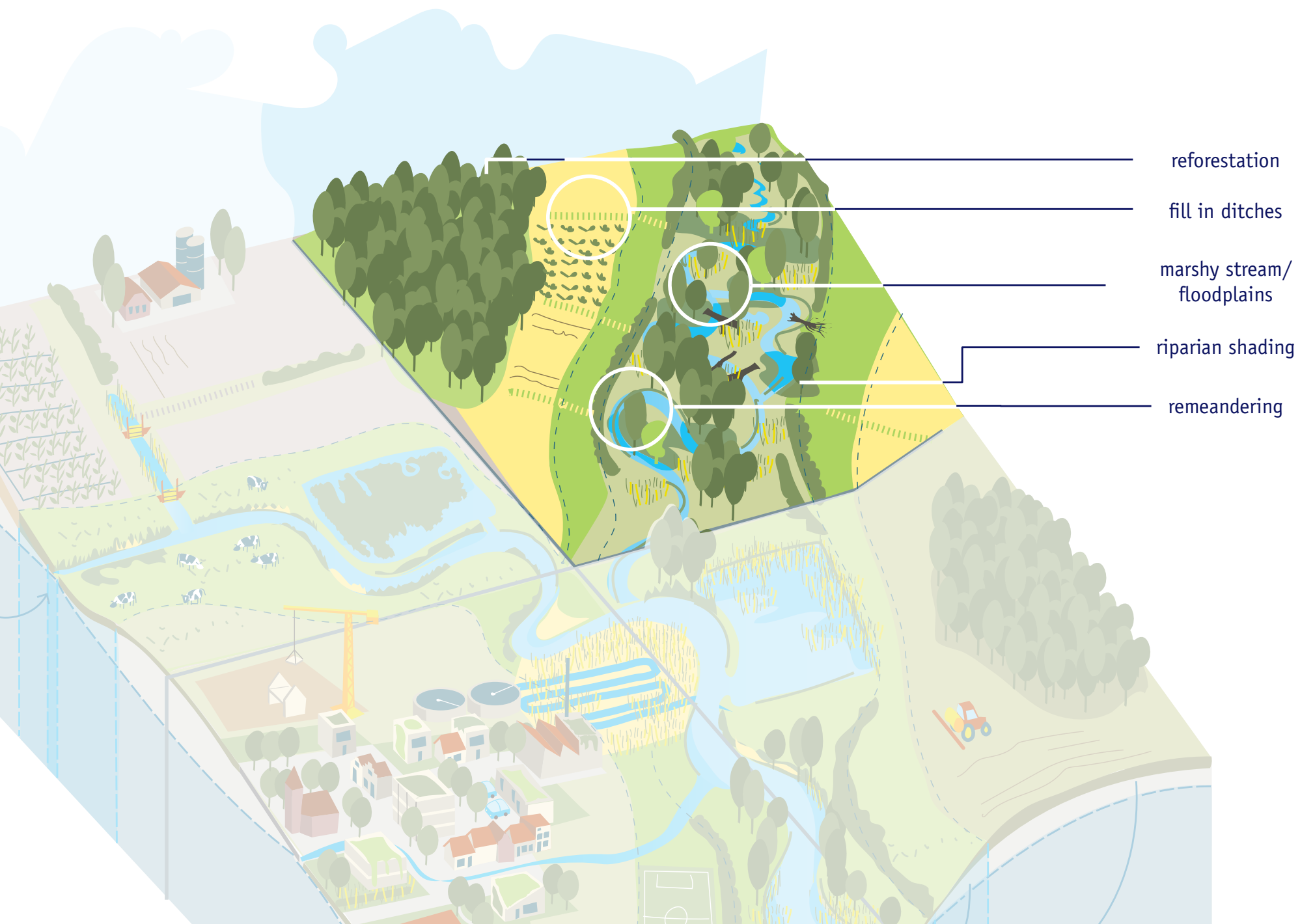
reduce drainage  
precision irrigation  
(robotved)

water storage  
increase  
organic  
matter content

climate-  
resilient  
crops







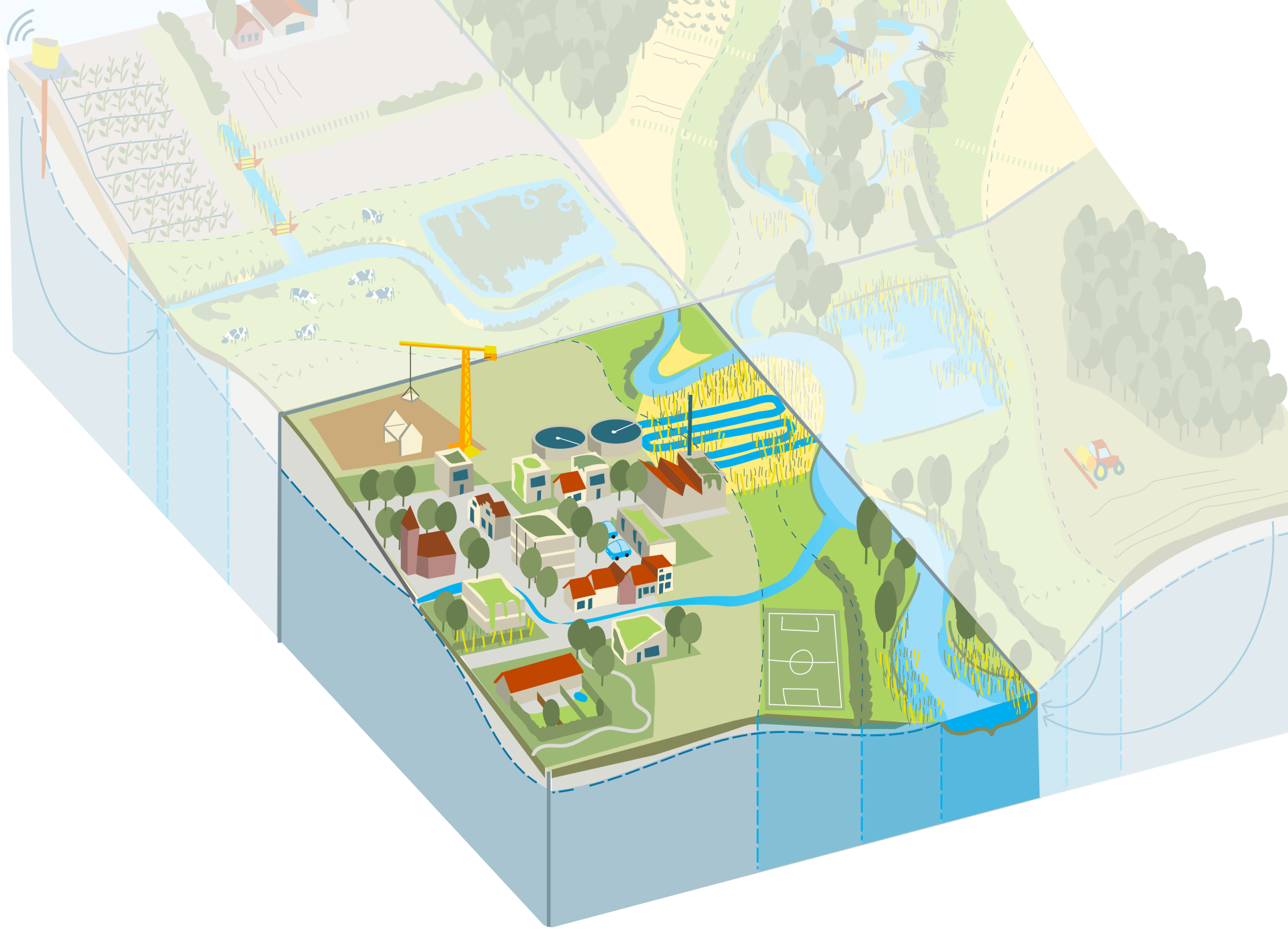
reforestation

fill in ditches

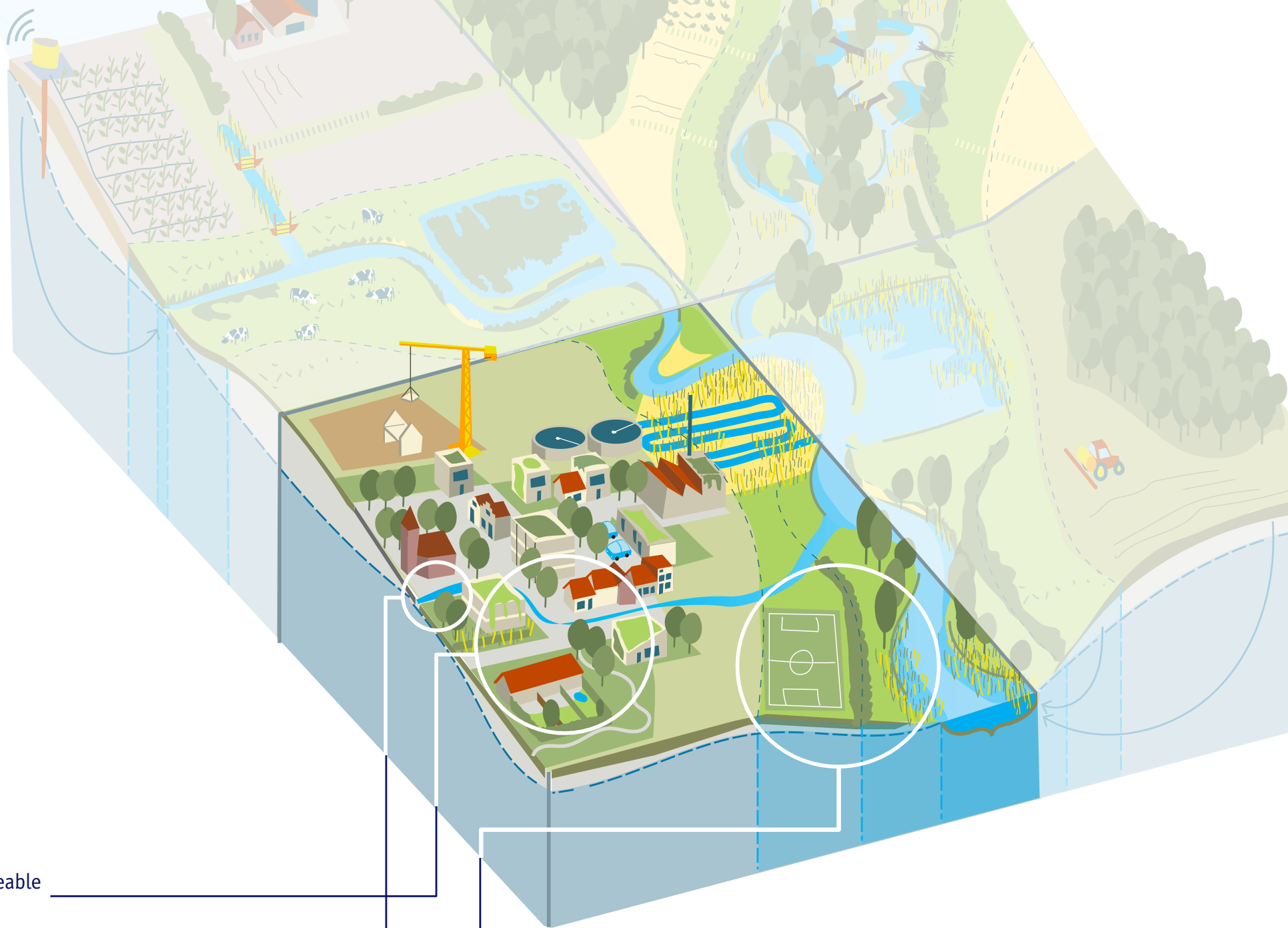
marshy stream/  
floodplains

riparian shading

remeandering







replace impermeable  
surfaces

disconnect  
rainwater drainage

swales

water storage in streets  
+ public spaces

green roofs

buffer zones

