TO A **CLIMATE RESILIANT** LOWLAND STREAM VALLEY

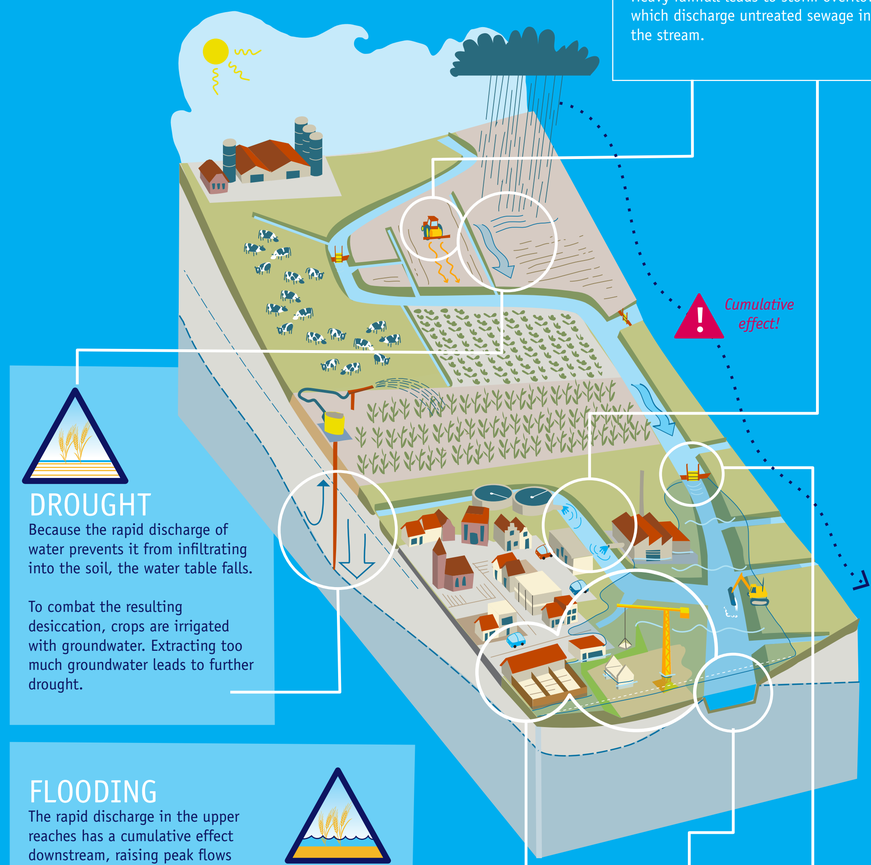
WAAROM?

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.



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 he 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.

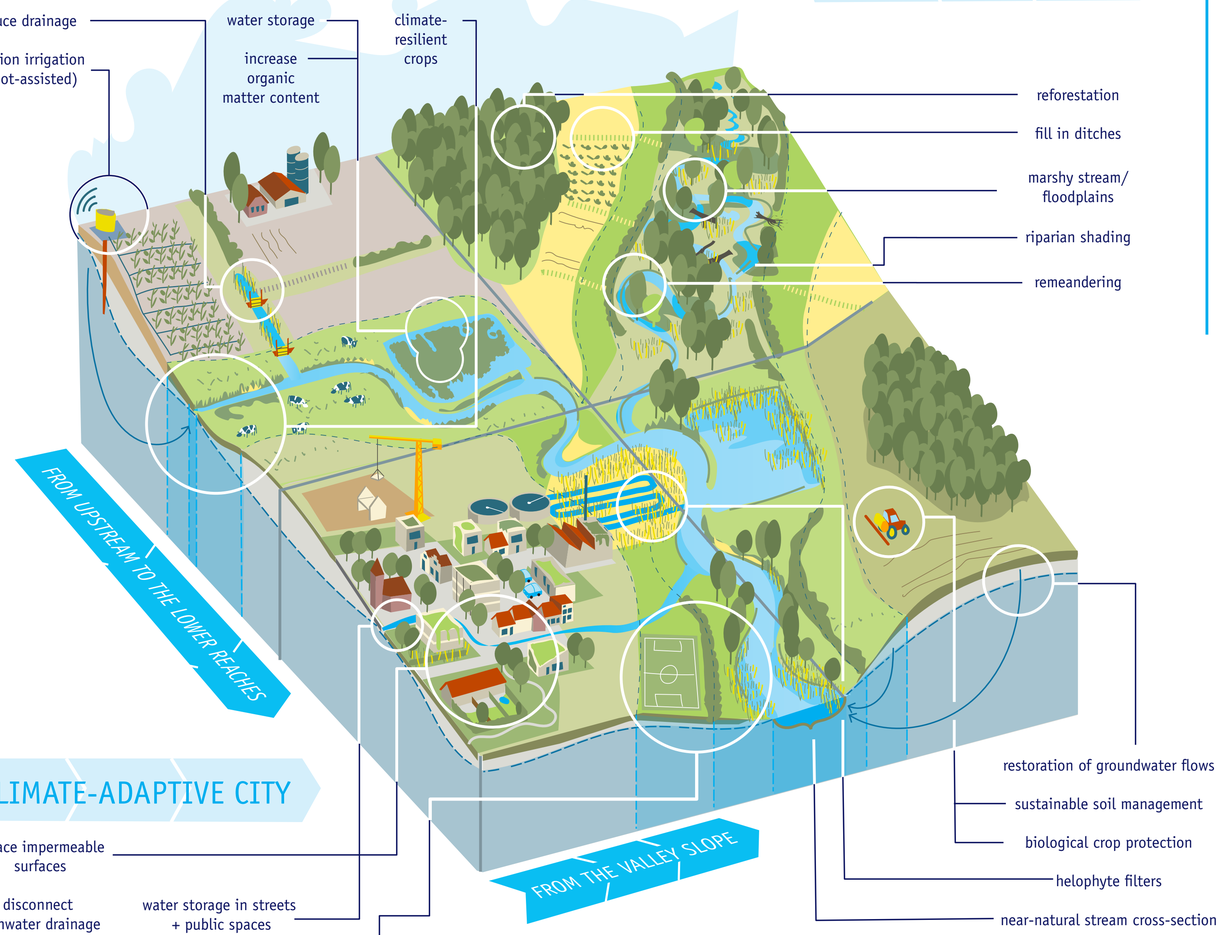
ECOLOGICAL DAMAGE
The straightening and regulation of streams largely prevents the operation of natural processes and degrades living conditions for plants and animals.

HOW?

RETAIN → STORE → DISCHARGE

CLIMATE-RESILIENT AGRICULTURE
- reduce drainage
- precision irrigation (robot-assisted)
- water storage
- increase organic matter content
- climate-resilient crops

RESTORE THE NATURAL SYSTEM
- reforestation
- fill in ditches
- marshy stream/ floodplains
- riparian shading
- remeandering



CLIMATE-ADAPTIVE CITY
- replace impermeable surfaces
- disconnect rainwater drainage
- swales
- water storage in streets + public spaces
- green roofs
- buffer zones
- 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

2019
34

infographics: Ronald van der Heide/www.ronaldvanderheide.nl