

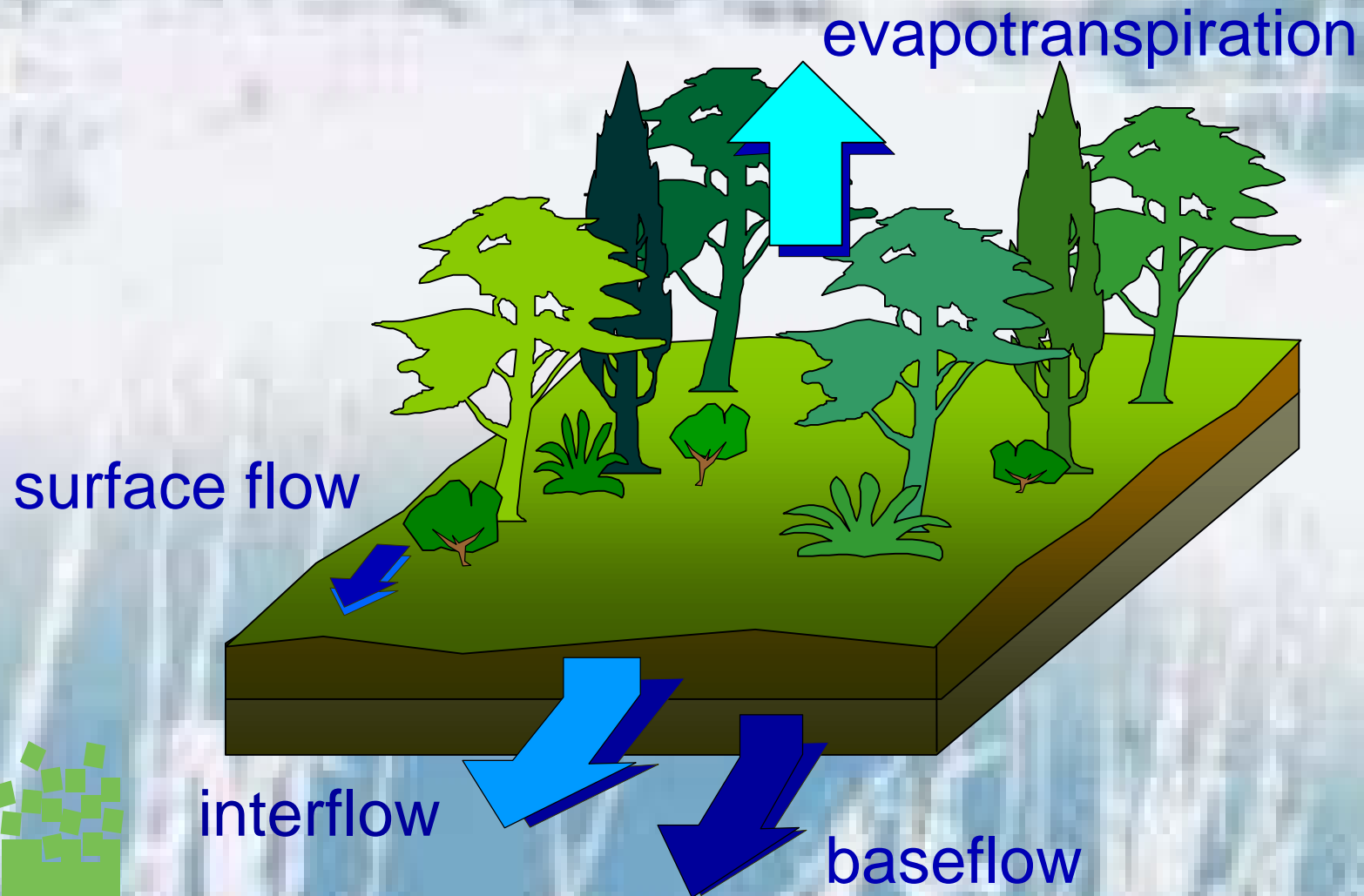
Sustainable urban drainage systems



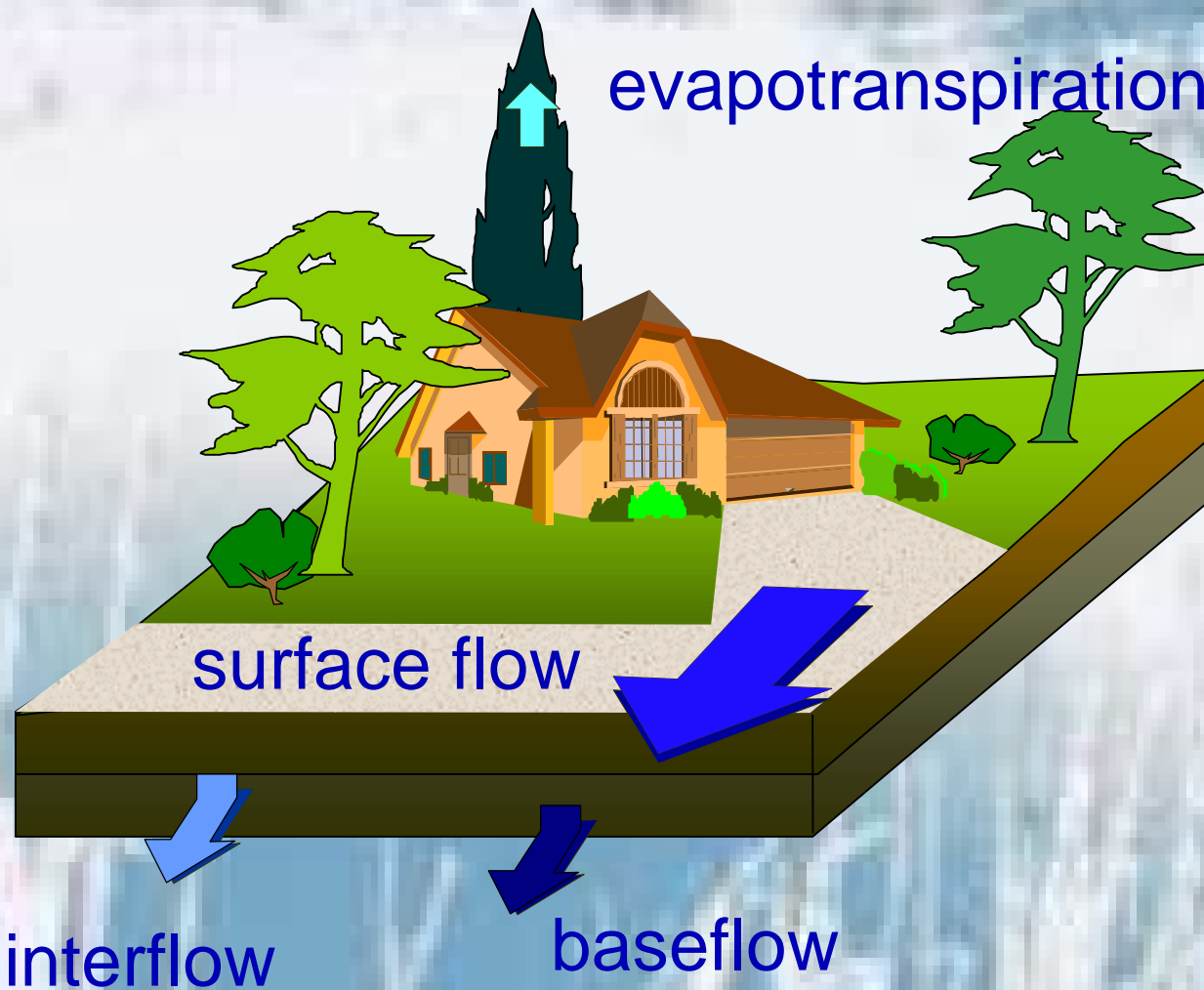
Presentation overview

- 💧 Problems of traditional systems
- 💧 Sustainability
- 💧 General methods used in SUDS
- 💧 Barriers to wider use

Natural catchment



Developed catchment



Conventional systems - quantity problems

- 💧 Flood risk
- 💧 Erosion
- 💧 Low flow problems



Examples of quantity problems

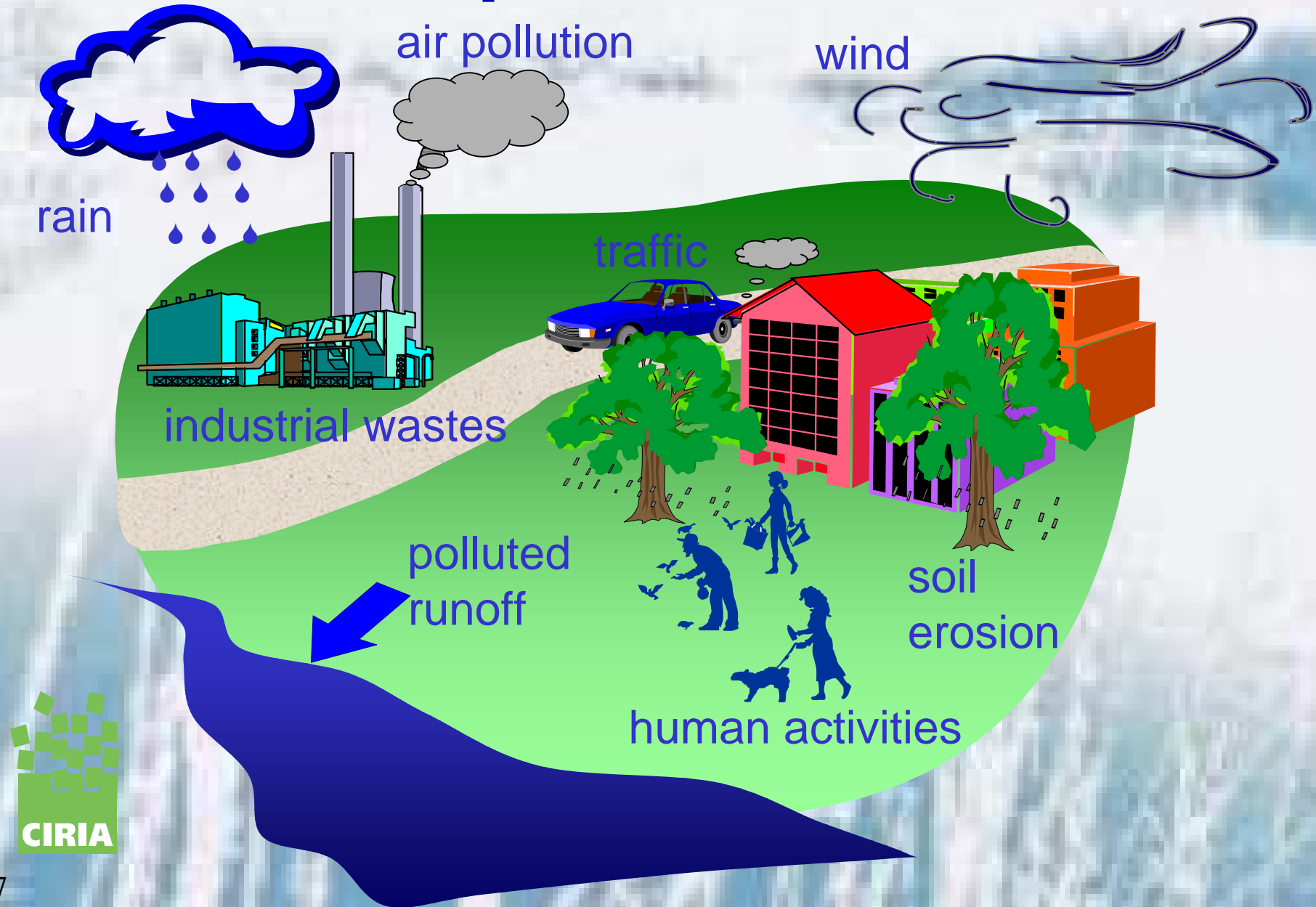


Conventional systems - quality problems

- 💧 Pollution of streams by surface runoff
- 💧 Intermittent overload of treatment plants
- 💧 CSO pollution of receiving water bodies



Diffused pollution sources

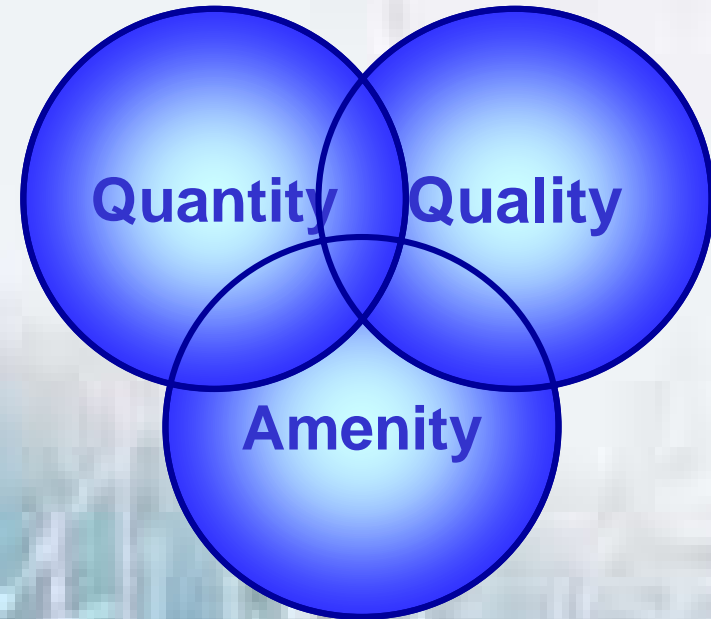


Approaches to drainage

Conventional approach



Integrated design



Aims of sustainable urban drainage



- Reduction of flood risk
- Reduction of pollution of receiving water bodies
- Improvement of urban amenities
- Better use of resources

SUDS techniques

- 💧 Prevention
- 💧 Permeable surfaces
- 💧 Filter strips and swales
- 💧 Infiltration devices
- 💧 Basins and ponds

Prevention

- 💧 Don't pave areas unnecessarily
- 💧 Drain to lawns
- 💧 Prevent spills
- 💧 Road sweeping



Permeable surfaces

- Gravel areas
- Solid blocks
- Porous blocks
- Continuous pavement



Filter strips and swales

Vegetated surface features mimicking natural drainage

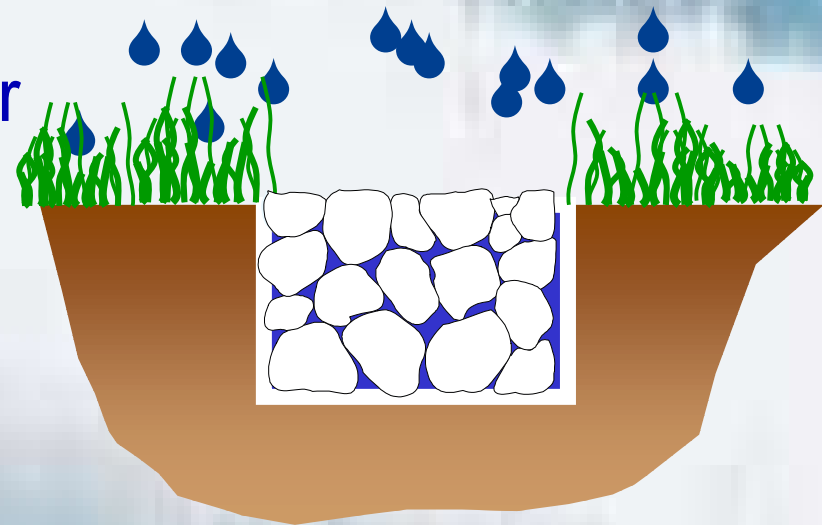
- 💧 Strips - treatment and amenity
- 💧 Swales - conveyance, infiltration, detention and treatment



Infiltration devices

Enhance the natural ground capacity to store/drain water

- 💧 Soakaways
- 💧 Infiltration trenches
- 💧 Infiltration basins



Basins and ponds

Store water at the ground surface temporarily or permanently

- 💧 Detention basins
- 💧 Retention ponds
- 💧 Wetlands



Barriers to wider use of SUDS

- 💧 Lack of design guidance
- 💧 Costs involved
- 💧 Operation and management uncertainty
- 💧 Adoption and ownership



Barriers to design

- 💧 Lack of guidance
- 💧 Lack of technical information
- 💧 Not wanting to be first
- 💧 Long term implications
- 💧 Missing or competing information
- 💧 Difficult to retrofit



Operation and maintenance

- 💧 Lack of experience
- 💧 Not wanting to be first
- 💧 Co-ordination
- 💧 Long term performance
- 💧 Reviving



Adoption



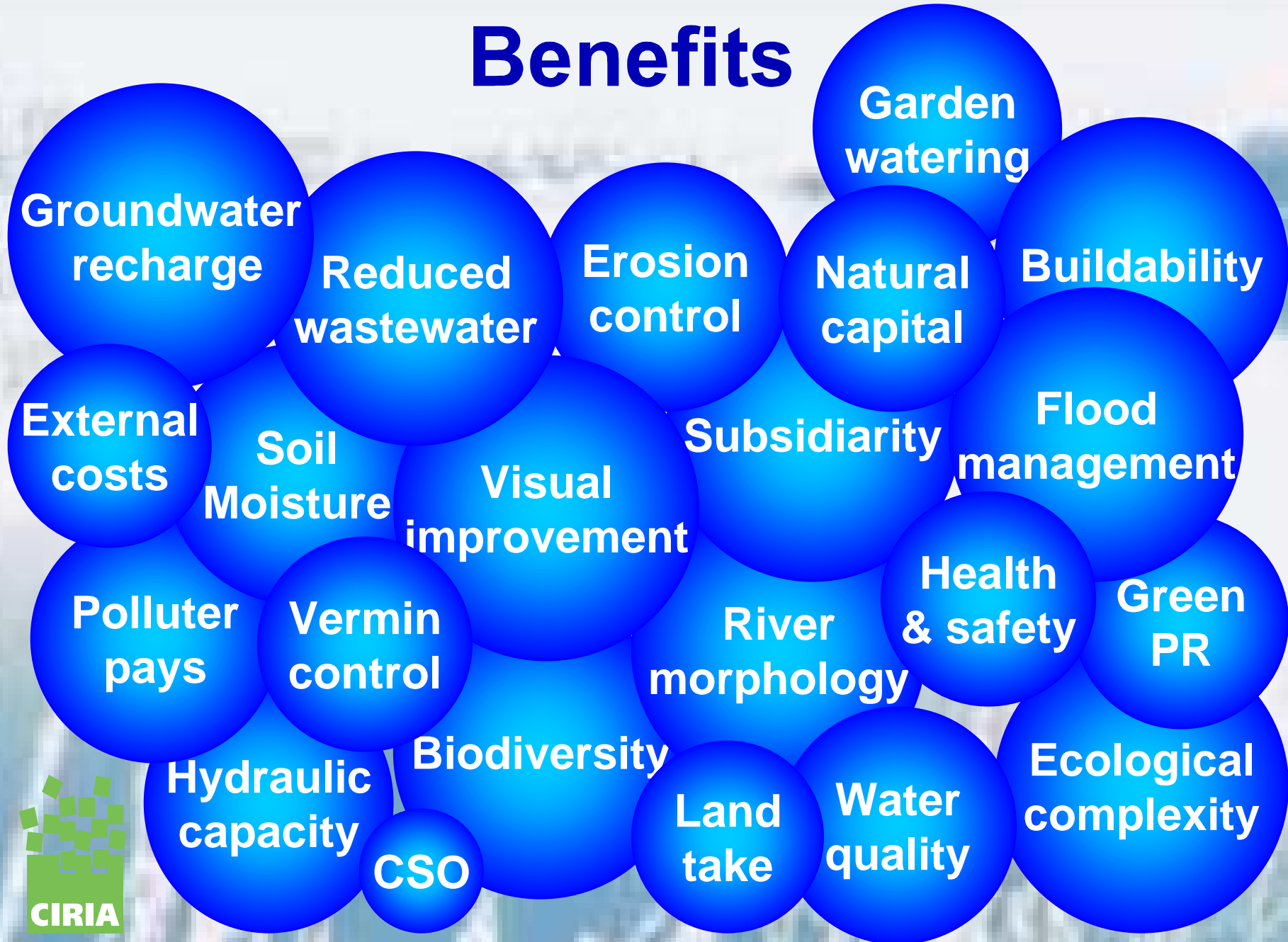
- 💧 Appropriate regulations
- 💧 Lack of agreements
- 💧 Not wanting to be first
- 💧 Long term implications

Costs



- 💧 Holistic approach
- 💧 Environmental costs and benefits
- 💧 Life-cycle assessment

Benefits



Best practice manual

- 💧 Introducing SUDS
- 💧 Using SUDS
- 💧 Benefits and barriers
- 💧 Planning framework
- 💧 Legal framework
- 💧 Demonstration sites with SUDS
- 💧 Barriers overcome

Summary

- 💧 Problems of traditional systems
- 💧 Sustainability
- 💧 Need for integrated approach
- 💧 Methods are available
- 💧 Barriers can be overcome



Wider message

- 💧 Implementation of SUDS could be a major step towards sustainable development - think globally
- 💧 You are not alone - act locally
- 💧 Partnership is needed - you should play your part

