

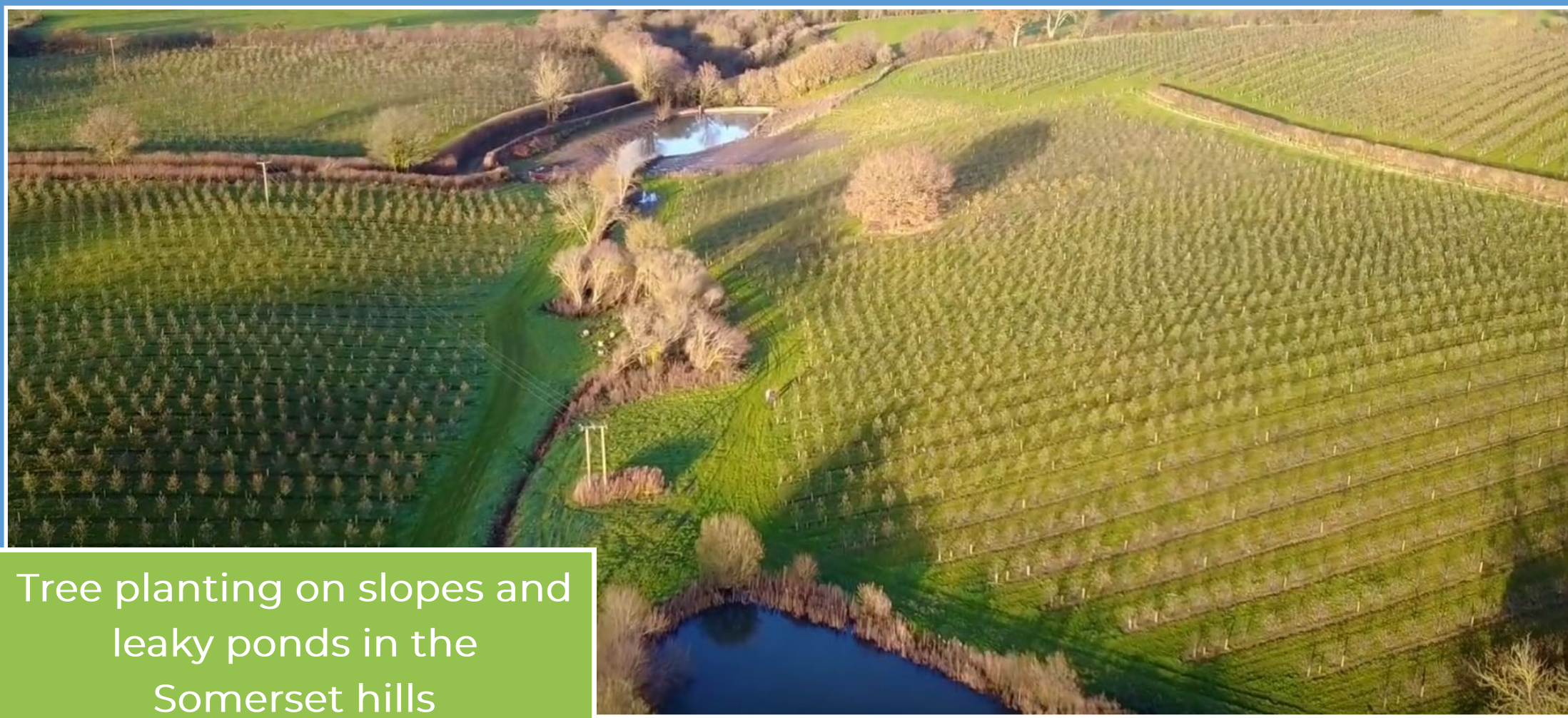
# Slow the Flow:

## Managing water throughout the landscape



Imagine pouring water into an hourglass. It drips through slowly, taking longer to fill the bottom than if you poured it into a straight glass. That's the basic idea of 'slow the flow': if we stop the water coming downstream all at once, then flood risk is reduced.

Hilly areas in the upper and mid catchment are the main focus for this, but even in areas closer to the floodplain, working with natural processes can help.



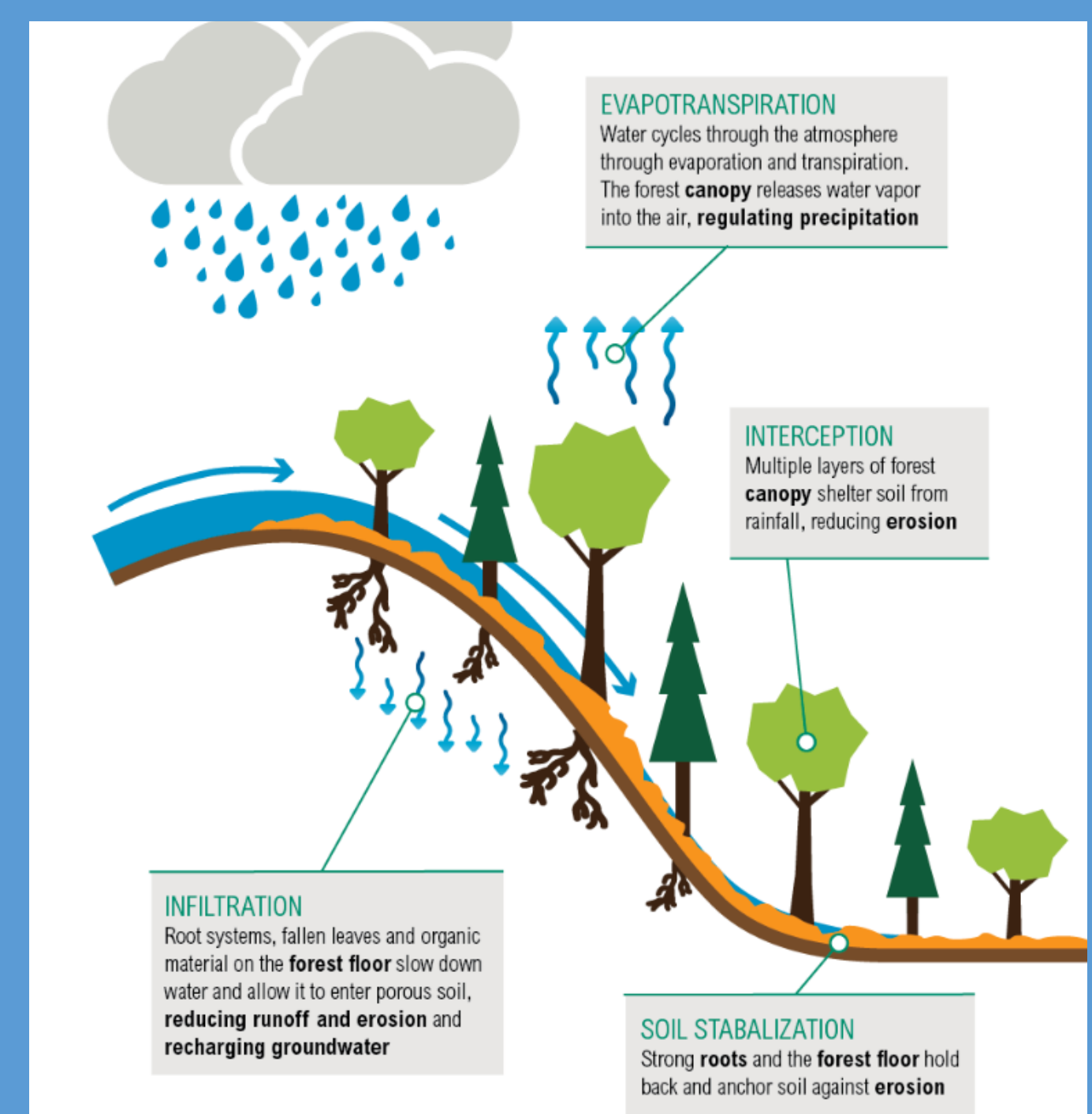
Tree planting on slopes and leaky ponds in the Somerset hills

Although it can't necessarily prevent flooding in an extreme weather event, slowing the flow can help water soak into the ground and reduce overall flood risk. In Somerset's hilly areas, techniques such as these are being used:

- Leaky Dams (right): Water can slowly escape through the gaps, but they capture high flows and allow more water to soak into the ground
- Offline Ponds: These are effectively 'bowls' in the landscape, where grazing and normal farming takes place. High water levels cause them to fill, creating temporary ponds.
- Woodland creation: Tree planting needs to happen in the right place to help manage water. Steep slopes are a good example.
- Soil and land management: Farming practices can encourage infiltration and catch runoff.
- Cross-slope Hedge Planting: As with trees, new hedges planted in the right places help manage water.



Leaky dam on a stream in the Somerset hills



*“Flood risk cannot be managed by simply building ever bigger hard defences.”*

*- EA Evidence Directory, Working with Natural Processes, 2018*

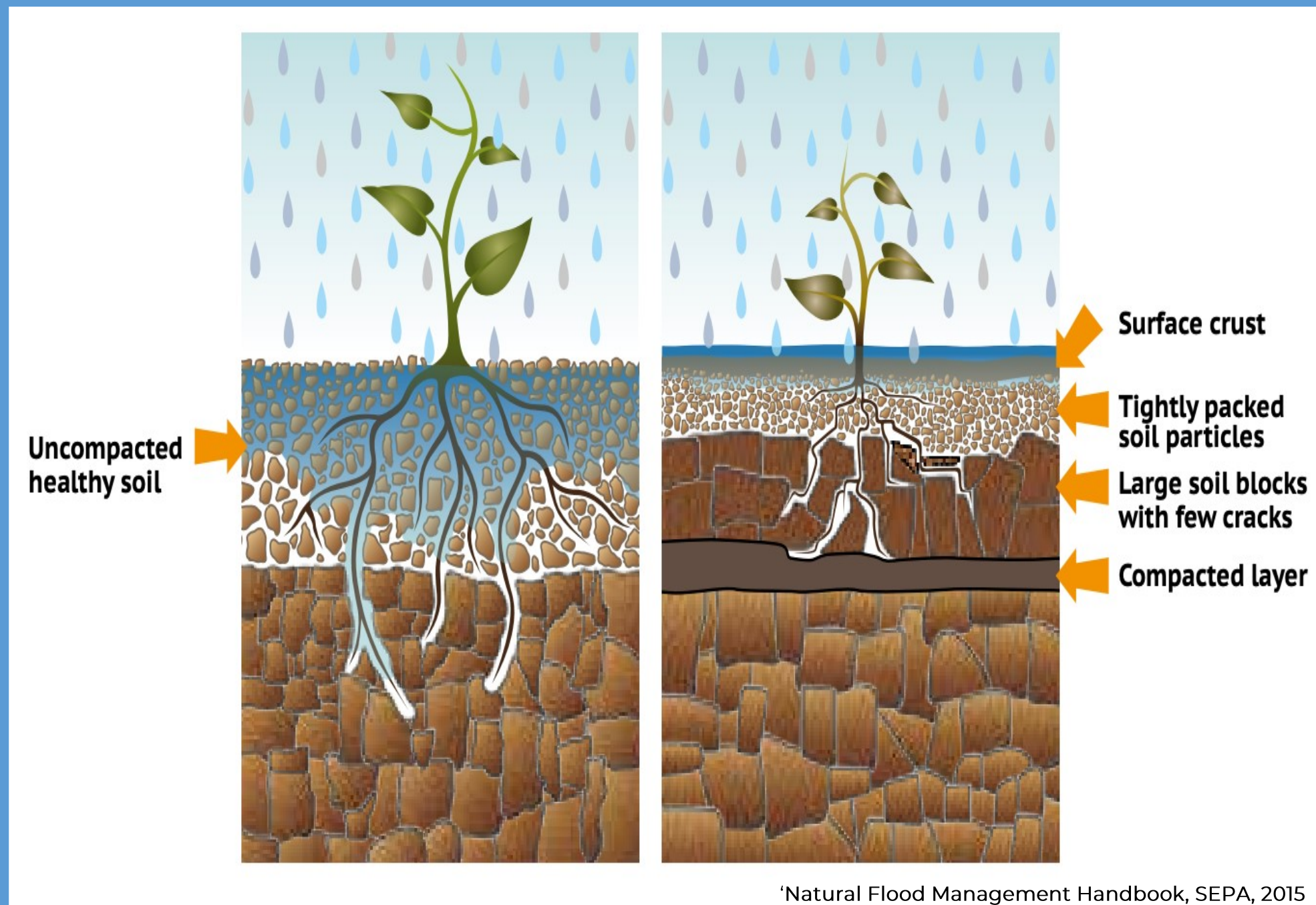
Although difficult to measure because no two rainfall events are the same, there is a great deal of evidence for the effectiveness of natural flood management. Many places are investing in these measures to reduce flood risk, including Somerset through projects such as Hills to Levels.

Nature based solutions are often called 'no regrets' methods, because they are low-cost, work well alongside engineering solutions, and have many benefits to communities and wildlife.

# Not Just Any Old Dirt:

## The Role of Soil in Water Management

Soil is amazing! Not only does it feed us and host a quarter of Earth's biodiversity, but healthy soil is also like a sponge, reducing runoff,

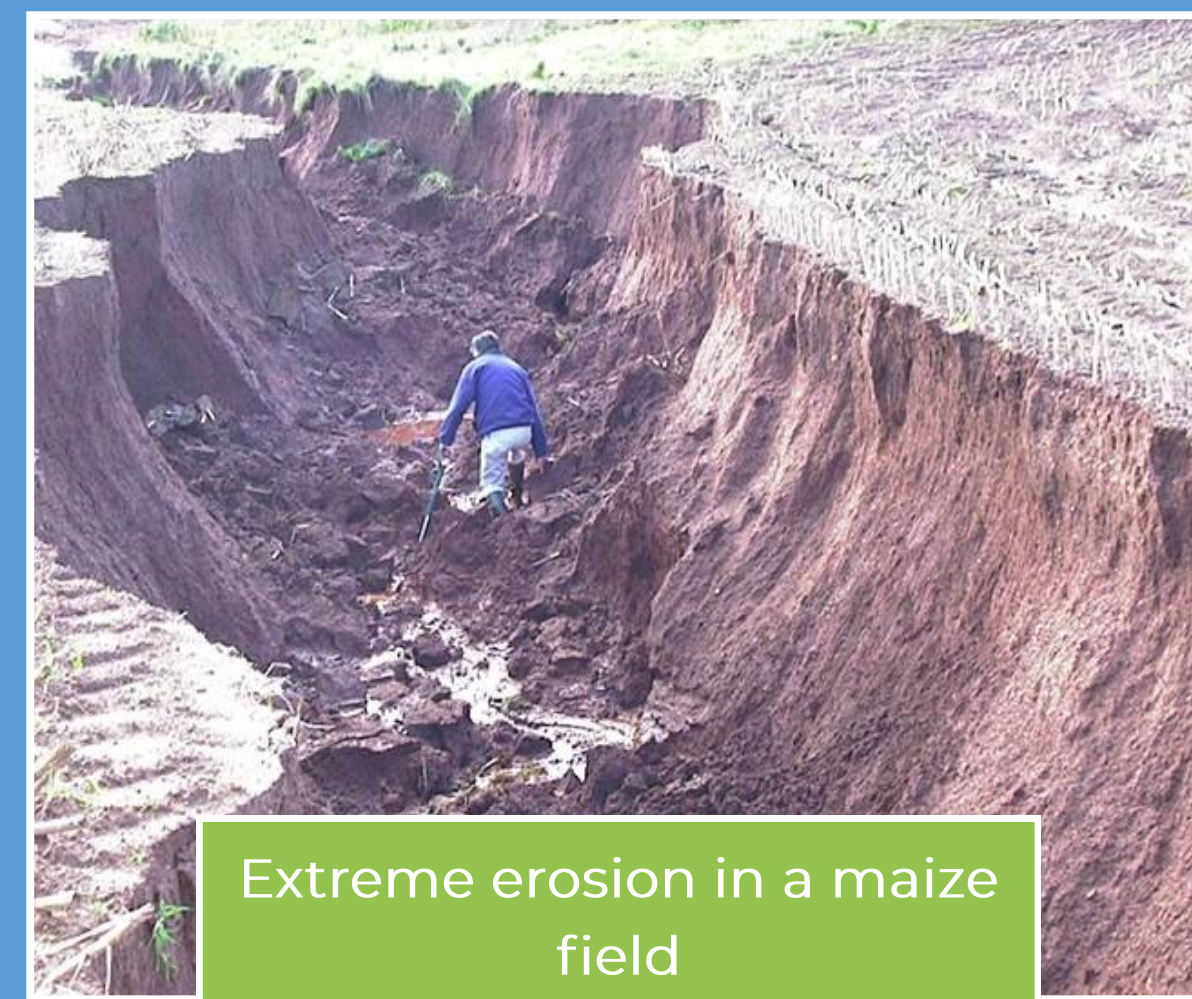


However, soil can get compacted, especially on farms by the movement of heavy machinery.

- Compacted soil soaks up less rain, with runoff 50-60% higher than on healthy soils.
- Compacted fields are less productive, needing twice as much nitrogen to maintain yields.
- Soil degradation has been calculated to cost up to £1.4 billion every year, of which £233m is the cost of flooding directly related to compaction (Securing UK Soil Health, Parliamentary Report 2015).

A 2013 study in South West England found that only 10% of our soil is in good condition. Severe levels of soil degradation were causing high rates of runoff at 38% of sites, while 50% of the sites had moderate degradation and localised runoff.

(Palmer and Smith, Soil Structural Degradation in SW England and its impact on surface water generation, 2013)



Extreme erosion in a maize field



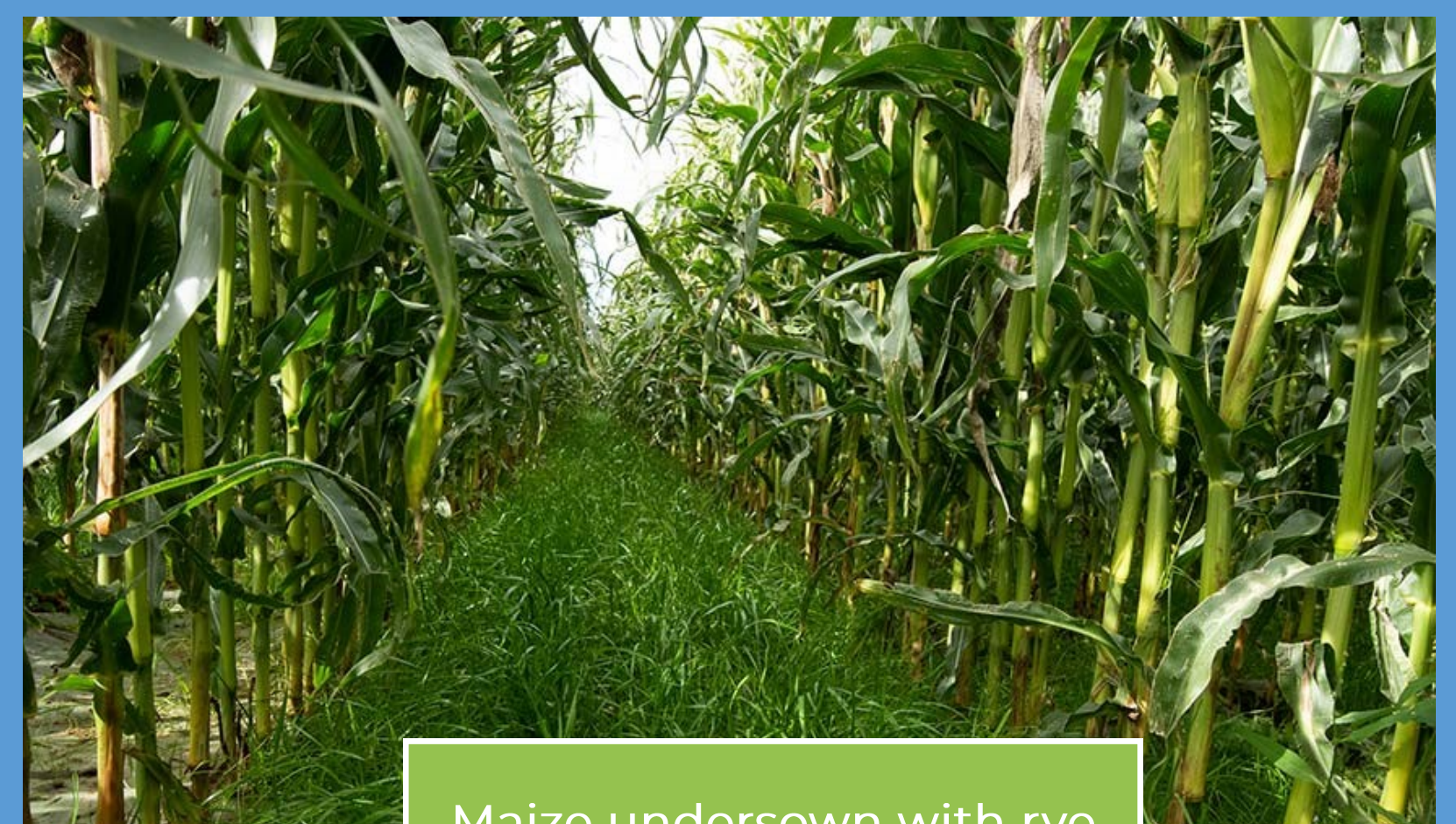
Run-off in a Somerset field, Jan 2020

Lots of farmers are working to protect soil using science, historic knowledge and research to improve production methods.

Reducing the amount of ploughing helps earthworms and insects, as well as wildlife such as birds and bats.

Direct drilling lowers carbon emissions and reduces soil damage. Compaction issues are often invisible, happening below the level of the plough, requiring careful management and time to recover. Farmers are also exploring growing different varieties or types of crops, making choices that are best suited to their land.

Up to half of all river sediment comes from maize fields in areas where it is grown. Undersowing with



Maize undersown with rye grass to reduce run-off

Support our Farmers!

Modern food production puts a lot of strain on farmers, with low prices and complex rules. It also strains the land, with intensive grazing and heavier machinery causing compaction, erosion and runoff. You can support good practice and our farming community by buying high quality meat and dairy. Buy from the farm gate, from trusted local suppliers or look for certification such as Pasture for Life, Red Tractor, Soil Association, or LEAF.

# Concrete Jungle:

## Water in our Towns and Villages

Whether you live in a town or village, there are areas where the water can't soak into the ground. Rain runs off your roof, patio, driveway and the roads outside your house, adding to the amount of water in the rivers and drainage systems. Housebuilders now have to incorporate 'Sustainable Drainage Systems', or SuDS: features like porous driveways or 'swales', ditches that capture water in high rainfall. SuDS have many other benefits, greening our urban spaces and creating habitat for wildlife, and they can also help reduce heat stress and the impacts of drought.

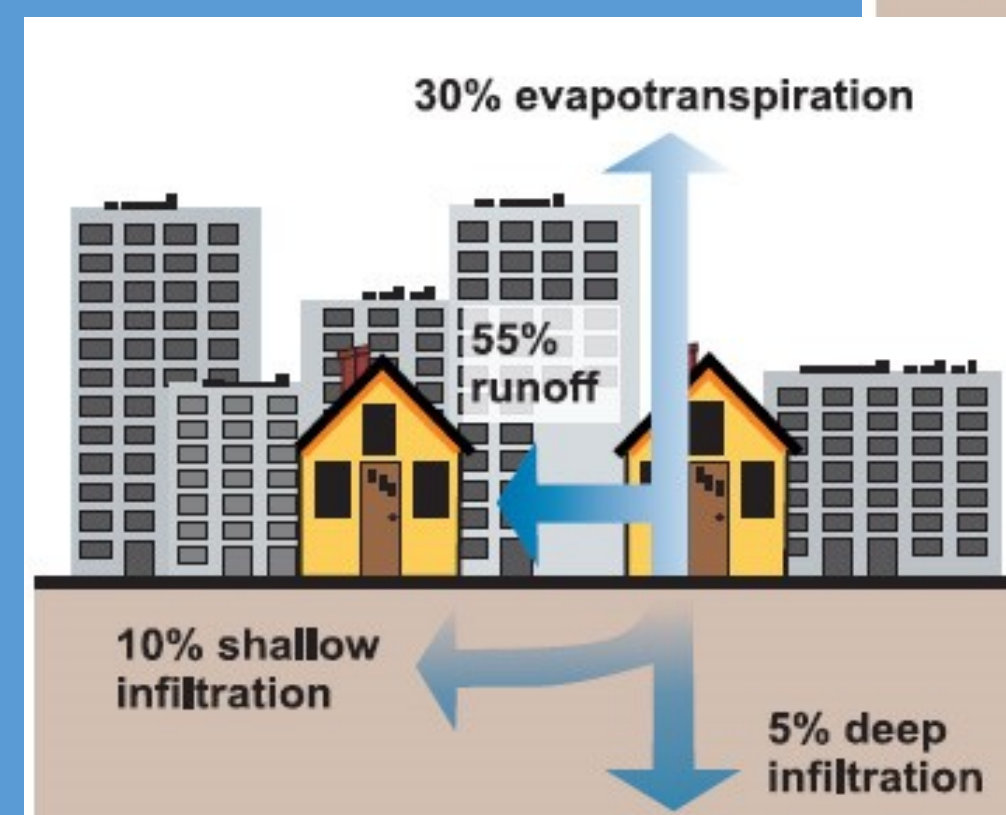
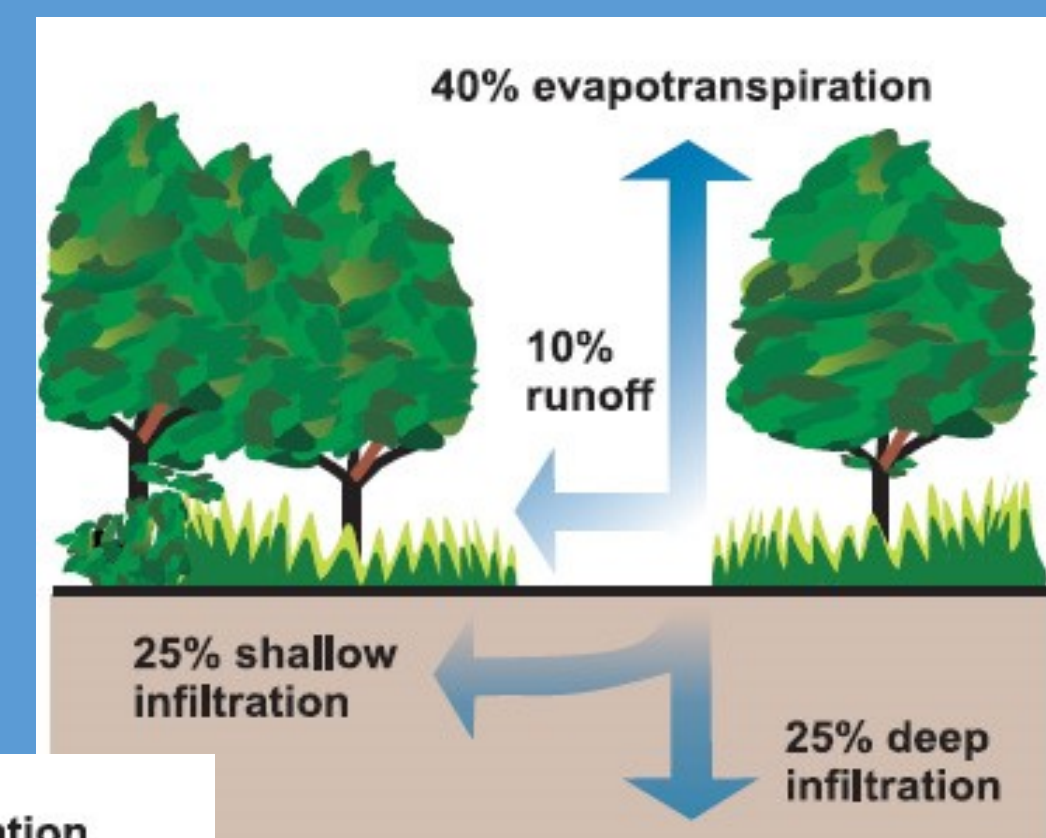


Image: Slowtheflow.net

### SuDS in your community:

Are you planning work on your home, garden or a community building? Keep in mind the principles of SuDS.

- Could an extension or new garage have a green roof?
- Could you use permeable paving for the patio or driveway?
- Can you fit water butts to capture stormwater? These can overflow into a rain garden - an area of garden planted with species that like it wet.
- If you have a large garden, trees, ponds and hedges can help manage water if they are in the right place.



*"All drains lead to the sea." - Nemo*

'Combined sewers'

take surface water and the drainage from toilets and sinks. They can get overwhelmed in heavy rain with exceptionally unpleasant results!

Anything we can do to reduce the water going into these systems helps.

Trees stop up to 12% of water getting to the ground, even in winter. As well as capturing carbon, their roots penetrate deep underground, helping water to soak away.

