

## Background paper on Catchment Nutrient Pollution Budgets

Evidence to inform the drafting of the Water Reform Bill

### Summary

Agricultural and wastewater practices (including fertiliser use, intensification of livestock farming, sewage overflows) are driving excess nutrients in the water environment. With pollution adding up from so many sources, the current approach of case-by-case controls for nutrient emissions is not effective. Given the numerous and disparate sources of these excess nutrients, it is essential that a whole systems approach is taken to ensure an overall reduction in nutrient pollution.

**Catchment nutrient pollution budgets** (CNPBs) offer an effective, whole system solution. Nutrient budgeting would determine the amount of pollution a given catchment can withstand, inform planning and permitting decisions, and drive upstream efficiencies in nutrient use.

### Policy proposals

1. The Clean Water Bill should place a duty on the Secretary of State to introduce “catchment nutrient pollution budgets” on activities that involve the emission of nutrient pollution. These limits must reduce and maintain the level of Nitrogen, Phosphorus or other relevant pollutants in water bodies within ecological limits, with the catchment budget ratcheted down over time.
2. To inform such catchment budgets, the Secretary of State should introduce a National Nutrient Strategy, with an embedded national nutrient budget, to identify routes to reduce nutrient pollution in line with this budget and relevant statutory targets. This Strategy should be published within two years of Royal Assent, setting a roadmap for farm-gate nutrient balancing requirements and establishing routes for nutrient circularity at regional and national levels.
3. Farm-gate nutrient balance sheets should be required of all agricultural managers/holdings, thereby providing an overview of nutrient inputs and outputs across the whole farm and calculating any nutrient surplus.

### The problem: cumulative pollution

**Agriculture** is one of the leading causes of England’s declining water environment, contributing [40%](#) of pollution. But current regulations address the symptoms, not the driver, of nutrient losses. Ultimately, there is no mechanism to drive reductions in nutrient use at the whole farm level. Some individual intensive farming operations require a permit under the Environmental Permitting Regulations (pigs and poultry), but there is no cumulative catchment assessment of the impact of wider nutrient sources. Pollution measures on other sectors are undermined when agricultural operations can keep adding pollution pressure to a river with no overall limits.

Excess fertiliser use leads to nutrients, primarily nitrogen and phosphorus, leaching into rivers and driving eutrophication - the extreme growth of algal blooms - which suffocates aquatic and marine life and contaminates drinking water. While this overapplication of fertiliser is environmentally damaging, it is also economically inefficient for farm businesses with approximately [£397m](#) lost each year as synthetic fertiliser.

Excess nutrient use in agriculture is largely a result of intensive farming practices. In intensive arable systems, the focus is often on maximising short-term yields with little regard for sustainability, whereas less intensive approaches can reduce pollution and prove [more profitable](#).

As seen in the growing intensive poultry and dairy industries, more nutrients are being produced than can be applied on nearby land. Low profitability in the sector has driven farmers towards systems that rely on animals being housed indoors for longer periods to accelerate growth through concentrated feed and increase milk yields. As a result, many animals are now housed indoors for most, if not all, of the year. This has two major consequences:

- First, indoor livestock systems rely heavily on imported, nutrient-rich feed rather than grazing on grass. This manure contains much higher nutrient levels, and is produced in liquid form, known as slurry.

- Second, because the number of animals in these systems tend to outweigh the land carrying capacity, the volume of slurry produced exceeds the land's capacity to absorb it sustainably. Slurry is stored in lagoons, pits or tanks until regulations allow it to be safely applied to land, increasing the risk of spills and leaks. Where farms lack sufficient land or adequate slurry storage facilities, slurry is often spread in quantities greater than crops and soils require.

This trend towards intensification is becoming a self-fulfilling prophecy. As farms have consolidated and smaller holdings have folded under economic pressure, livestock production has become increasingly intensive, with farmers striving for greater yields and relying still more on numbers and volume to ride out market volatility. In many cases, individual farmers are pushed by supply chain pressures and market forces to adopt more and more intensive (and unsustainable approaches).

A catchment nutrient budget would bring farming within an overall ecological “cap” on pollution in a catchment, improving planning, halting the cycle of intensification and, in many cases, giving power back to farmers to resist pressure to intensify their operations.

**Wastewater companies** contribute the second largest nutrient load to the water environment at [35%](#), which is notably more phosphorus than nitrogen. Yet only 50% of phosphorus is removed through the wastewater treatment process, meaning even treated water released into rivers or leaked through pipes contributes to phosphorus levels.

Combined sewage overflows (CSOs) are a major source of pollution from the wastewater system. The UK relies on an outdated sewage system that combines rainfall with wastewater. Alongside a failure to update infrastructure as the population has increased and as climate change has brought heavier rainfall, this wastewater system leaks sewage into rivers during periods of heavy rainfall. While water companies are granted permits to release a certain volume during such periods, [evidence](#) has grown in recent years that water companies have released significantly more than is legally permitted.

Table 1. Nutrient load to rivers in England, by pollution source.

| Source                      | Nitrogen (%) | Phosphorus (%) |
|-----------------------------|--------------|----------------|
| Agriculture                 | 70           | 30             |
| Water sector                | 25           | 70             |
| House building <sup>1</sup> | 0.29         | 0.73           |

Taking a systems approach to considering nutrient pollution is critical to designing solutions that are fit-for-purpose. Doing so requires all responsible actors to reduce their pollution load, which is a more proportionate approach than nutrient neutrality (see Table 1). Catchment level nutrient pollution budgets could be used to determine the amount of pollution a given catchment can withstand from all polluting sources. For the water sector, a catchment budgeting approach would require companies to focus infrastructure upgrades and nature-based solutions in catchment areas where limits are breached. It would also add transparency and accountability to water company investments in other sectors to reduce pollution, ensuring that water bill payers' money is spent efficiently to reduce pollution in the most effective way.

## What is a nutrient pollution budget?

Acting as a similar mechanism to carbon budgets, a nutrient budget would restrict the amount of nutrients being emitted to the environment from polluting activities. Budgets would drive increased nutrient use efficiency by setting pollution limits based on the ecological health of the river and surrounding sensitive habitats. Together, regional or catchment limits should be aligned with national statutory targets for climate, biodiversity, water pollution and air quality, such as the Climate Change Act, Water Framework Directive and the Environment Act, to ensure that regional efforts “add up” to delivery of national targets. This would enable greater understanding of how individual actions at a

<sup>1</sup> **Housing development** is currently under strict moratoriums in 74 catchment areas due to nutrient pollution. In most of these catchments, new developments are not the primary source of nutrients.

local level will contribute to delivery of national targets. To enable this vertical alignment, the government should introduce a National Nutrient Strategy that would direct catchment level budgets to be aligned with statutory targets.

At the catchment level, nutrient budgets would ensure the responsibility to achieve a set pollution limit is shared by all relevant actors, including water companies, farmers, housing developers, local authorities and other industries managing or polluting the water environment. Across a catchment or region, permits to pollute under the Environmental Permitting Regulations (such as a wastewater treatment works or industrial poultry units) would have limits set in context of other pollution sources to account for cumulative pollution impacts. This would ensure that pollution hotspots like the River Wye are not allowed to develop, as additional permits would need to be compatible with overall pollution limits.

Contributing activities that are not covered by permits would also be required to meet pollution limits. Nutrient balance sheets are a tool that [a majority of farmers](#) use to track nutrient use and losses at the farm gate level. These are currently being considered for introduction into the regulatory baseline and could be used to evidence each farm's contribution to the pollution load in a catchment. Enforcement of pollution limits could sit under the consolidated agricultural water pollution regulations that is being developed by Defra.

On farms with a small land area, nutrients are transported to neighbouring farms as farmyard manure and slurry. Given the increased concern of nutrient pollution and sewage sludge contamination, actors like water companies and retailers are asking for greater transparency across the supply chain. CPNBs would enable the tracking of manure transportation and sewage sludge applications between and across catchments, to ensure the problem is not transferred into neighbouring catchments.

Crucially, it would be the pollution that would be restricted through a budget, rather than an activity such as fertiliser applications. If farmers manage nutrients in line with proper and effective nutrient balancing, and comply with their nutrient management plan, farms will be able to demonstrate high fertiliser use efficiency that aligns with pollution limits, which would mean budgets would not impact food production.

## **Why are CNBs needed?**

There is currently no mechanism to cap nutrient pollution at a catchment scale.

Nutrient management plans, regulated under the Farming Rules for Water and incentivised in the Sustainable Farming Incentive, are targeted at the crop and soil need. While this is an important part of nutrient management, it does not require farmers to consider the embedded nutrients brought onto the farm as feed or in bedding. Further, River Basin Management Plans and other measures to reduce nutrient pollution at the catchment scale have no direct limit or link to national targets or farm-level activity.

CNPBs would limit polluting activities in order to improve water health, biodiversity, and air quality. Implementing nutrient budgets requires polluting actors to operate at a level that enables progressive nutrient reductions across the catchment, towards an overall national target.

Catchment-level budgeting also enables the identification of pollution swapping, where activities like burning manure via anaerobic digestion or incinerating poultry litter may simply shift pollution from one medium to another (e.g., air, water, or soil). A budgeting approach would prevent “greenwashing” by creating transparency and avoiding one kind of pollution simply being swapped for another.

## **Why is this not covered by planning and permitting regimes?**

The permitting regime, like the planning regime, can and should ensure that consenting decisions will not result in unacceptable off-site environmental impacts. However, permitting and planning decisions operate under separate legal frameworks, regulated by separate authorities. As a consequence of this division, overlaps and gaps emerge, creating misunderstandings regarding the powers and jurisdictions of the regulators, creating a regulatory gap in which environmental harm is insufficiently addressed.

Planning decisions are made at the local authority level, subject to the administrative boundaries of that locality, and so do not consider the cumulative polluting activity in a given catchment boundary. Similarly, the amount of untreated sewage released by wastewater companies, as allowed by permits,

is not allocated at a rate that accounts for the cumulative impacts of other pollution or the river's ecological health.

This regulatory gap is illustrated by River Action's current judicial review against Natural Resources Wales (NRW). In this case, River Action is challenging NRW, which argues that environmental impacts from off-site manure spreading are regulated by planning laws, not permits, which cover only activities within the installation boundaries. Under this understanding, planning authorities can assume that manure management is handled through permitting, while NRW can say it is a matter for planning authorities. The practical result is that no regulator addresses the indirect and cumulative impacts in already overburdened catchments. In contrast, catchment nutrient budgeting would provide a mechanism to deal with decisions impacting nutrient pollution in a more joined-up manner.

Poultry in the Wye catchment produces 150,000 tonnes of poultry manure which has been identified as a primary driver of ecological decline. The accumulation of industrial poultry units in the catchment has been allowed because there is no mechanism to calculate when more manure is produced than can be safely spread in that catchment. In response, the government has ruled that all manure has to be shipped out of the Wye catchment, yet this forces farmers to use synthetic fertilisers instead. A mechanism is needed that can inform permitting to set the catchment on a trajectory towards Good Ecological Health by identifying a catchment's nutrient load and putting a limit on permitting and planning approvals when that maximum load is reached.

### **What is the difference between a nutrient budget and a nutrient balance?**

A nutrient balance accounts for the flows of nutrients entering and leaving a given area. At the catchment scale, a balance would identify the nutrients entering the catchment from different sectors and different geographical areas. Farm-gate nutrient balance sheets enable farmers to think about nutrient flows across the whole farm, allowing a systems change towards a lower risk farming system. This encourages an approach where nutrient applications are not routinely maximised, as in a yield-focused approach, but targeted to the most profitable and efficient level - called a Maximum Sustainable Yield. Nutrient balance sheets could be used to inform compliance with budgets by tracking nutrient flows.

Going beyond what farmers apply to their crops (a nutrient management plan), a balance sheet would consider the nutrient content of feed, where livestock waste ends up and how it is managed. This would enable reductions in nutrients embedded in farming systems to reduce emissions of ammonia, nitrous oxide, and nitrates to rivers. Nutrient balance sheets should incorporate data on: agricultural inputs and outputs, and on-farm stocks and transfers.

At a farm scale, a healthy nutrient balance would involve a livestock carrying capacity that matches the land area. Moving towards this system with a reduction in excess inputs increases farm profitability and resilience to volatile food prices. Farms that produce more nutrients than can be safely applied on their land can sell farmyard manure or slurry to neighbouring farms, thereby reducing reliance on synthetic fertiliser. Allocating each farm a holding number that corresponds with their nutrient balance sheet would enable greater supply chain transparency around the movement of nutrients, whether that is livestock or sewage sludge.

This kind of approach has been used effectively in areas such as Poole Harbour, helping farmers to plan their operations more effectively and improve productivity at the same time as providing the underpinning information needed to support catchment-level limits on pollution.

### **Drive systems-level change at scale**

A National Nutrient Strategy should be implemented, to avoid pollution swapping and to identify win-wins such as reduced environmental harms and increased farm profitability. Catchment Nutrient Pollution Budgets could be set by River Basin Management Plans, or by Regional Water Authorities established under the Clean Water Bill, ensuring that regional limits "add up" to achievement of targets under the Environment Act. Those responsible for setting budgets should be required to design nutrient pollution reduction strategies and set progressive catchment nutrient pollution targets. These targets should then inform planning, permitting and consenting decisions within the catchment.

Reducing excess nutrients in surplus catchments unlocks economic growth by unlocking housing developments in Nutrient Neutrality zones. Simultaneously, this approach increases farm profitability, restores river health, and supports broader environmental goals.

## **Annex 1.**

### **Catchment Nutrient Pollution Budgets**

- (1) The Secretary of State must establish “catchment nutrient pollution budgets” to limit activities that involve significant emission of nutrient pollution or that cause or contribute to such emissions.
- (2) The Secretary of State must introduce regulations to specify—
  - (a) the activities to which a catchment nutrient budget will apply, including water and sewerage industry and agricultural activities.
  - (b) a process to set limits on pollution from relevant activities by reference to the level of Nitrogen, Phosphorus or other relevant pollutants in water bodies at a level and in a timeframe in accordance with relevant targets under the Environment Act 2021, The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 and any other relevant environmental targets.
- (3) For activities covered by an environmental permitting regime, permits in a catchment nutrient budget area may only be granted and may be varied from time to time in accordance with an assessment published by the relevant regulator of cumulative pollution in the relevant area that shows that the activity can be carried on within the catchment nutrient budget limits.
- (4) No person or authority can issue a permit or consent for an activity in an area covered by a catchment nutrient budget unless the activity can be carried on within specified pollution limits.
- (5) The regulations may provide for the establishment of trading schemes for the purpose of achieving compliance with the catchment nutrient budget.

*September 2026*