

Clear Waters and Financial Stability: From Risk Recognition to Economic Resilience

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Abstract

Water has emerged as a macro-critical resource and a material source of financial risk at the international level, where it was considered a local issue before. Droughts, floods, scarcity, pollution and the degradation of freshwater ecosystems may disrupt production, affect inflation, impair assets, weaken borrowers and generate losses across the financial system. These developments are relevant to central banks and supervisory authorities as they may threaten monetary and financial stability as well as the safety and soundness of financial institutions.

Recent research by the Bank for International Settlements (Frost et al., 2025) finds that higher water scarcity is associated with weaker economic growth and lower investment, as well as higher inflation, while greater water-use efficiency is associated with stronger growth and lower inflation. The Network for Greening the Financial System (NGFS) has developed a conceptual framework (NGFS, 2024) through which nature degradation can be translated into conventional categories of financial risk, including credit, market, insurance, liquidity, operational and legal risk.

This article develops five core messages. First, water-related risks fall within the mandates of central banks and supervisors as they affect monetary and financial stability. Second, water is a key transmission channel connecting climate change, nature degradation and the real economy. Third, the materiality of these risks must be assessed through location-specific, forward-looking and system-wide analysis. Fourth, supervisors should integrate water and broader nature-related risks into established prudential frameworks rather than create parallel systems. Fifth, the ultimate objective must be to move from risk measurement to resilience, including by mobilising private capital and strengthening international coordination.

Water is not to be treated as one additional item on an expanding environmental risk register. It is an essential ecosystem service, a factor of production and a potential source of systemic vulnerability. Integrating it into macroeconomic analysis, financial supervision and investment planning is becoming a necessary component of sound central banking and financial governance.

Keywords: water risk, nature-related financial risk, financial stability, price stability, central banks, prudential supervision, ecosystem services, resilience, sustainable finance.

1. INTRODUCTION

Central banks and financial supervisors are being confronted with a widening range of risk drivers. Many institutions already devote substantial resources to monitoring inflation,

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financial leverage, geopolitical uncertainty, cyber threats, technological transformation and the consequences of climate change. Against that background, calls to examine biodiversity loss, water scarcity, soil degradation and other forms of nature degradation may be perceived as attempts to add further responsibilities to already demanding mandates. This is understandable but ultimately misguided: central banks cannot ignore material threats to financial stability.

Water and broader nature-related risks are not separate from the traditional concerns of central banks and supervisors. They are potential drivers of the conventional risks that monetary and prudential authorities already monitor. When water scarcity reduces agricultural or industrial output, it may affect prices, productivity and economic growth. When floods damage buildings and infrastructure, they can reduce collateral values and increase credit and insurance losses, as well as fostering defaults in corporates and households. When water pollution interrupts production or creates legal liabilities, it can weaken corporate balance sheets. When ecosystem degradation reduces the capacity of land, rivers and wetlands to regulate water flows, it can increase the frequency and severity of water-related events.

Environmental policy remains principally the responsibility of governments and parliaments. The relevant question for central banks is not whether they should pursue environmental objectives independently of elected governments. The appropriate question is whether environmental degradation can materially affect the achievement of central bank and supervisory mandates.

Available evidence increasingly suggests that it can. Many central bankers have accordingly emphasised that considering climate and nature-related risks is not a discretionary extension of their mission. It is a response to material risks that can affect the stability of economies and the robustness of financial systems. At the same time, central banks must remain attentive to the boundaries of their mandates.

This mandate-based approach is particularly important for water. Water is a critical resource for food production, energy, manufacturing, transport, mining, public health, urban development and digital infrastructure. Yet its economic value and the financial consequences of its deterioration are not fully reflected in prices, corporate accounts and standard risk models.

The challenge does not lie in any lack of awareness. It is also an analytical and operational conundrum. Central banks and supervisors must determine how water-related shocks transmit to inflation and financial stability, how material exposures can be identified, how institutions should manage them and how uncertainty should be addressed without either overstating the evidence or waiting for perfect information.

More work is needed to strengthen our capacities in that field and to achieve our objectives. Five foundational pillars can however be considered.

2. PILLAR 1. WATER-RELATED RISKS ARE RELEVANT TO THE CORE MANDATES OF CENTRAL BANKS AND SUPERVISORS

Central banks do not need a specific environmental mandate to examine water-related financial risks. Their responsibility arises when those risks affect monetary and financial stability, channels of transmission for the monetary policy signals or the safety and soundness of supervised financial institutions.

This distinction is major. Governments are responsible for setting environmental objectives, allocating water rights, regulating pollution, financing public infrastructure and determining the distributional choices associated with the transition. Central banks and supervisors are not to decide how society ought to value nature or how water could be allocated among households, agriculture, industry and ecosystems. They must nevertheless assess the consequences of policy decisions or the lack thereof, and the physical degradation occurring, for the economy and the financial system.

The mandates of central banks may vary across jurisdictions, but price stability and financial stability are generally their core responsibilities. Water-related shocks can affect both.

2.1. Water and price stability

Water scarcity can constrain agricultural, industrial and energy production. Flooding can interrupt transport and damage productive capacity. Pollution can increase treatment costs or render existing water sources unusable. These effects can reduce aggregate supply and increase the prices of food, energy, manufactured goods and essential services.

Recent BIS research provides empirical support for this macroeconomic relevance. Using panel data covering 169 countries from 1990 to 2020, the authors find that higher water scarcity is associated with lower gross domestic product growth, weaker investment and higher inflation. They also find that greater water-use efficiency is associated with stronger growth and lower inflation. The paper concludes that water availability and efficiency may become relevant considerations for economic forecasting and monetary-policy analysis.

The monetary-policy implications need to be interpreted with caution. Central banks are not capable of eliminating a drought or restoring water storage through changes in interest rates. Temporary movement in food prices should not always be treated as a source of persistent inflation.

However, the conventional distinction between a temporary supply shock and a persistent inflationary process becomes less clear when physical shocks occur repeatedly, with heightened frequency and severity, affect multiple regions, modify expectations and disrupt price formation. Recurrent water shortages can raise production costs, alter investment decisions and weaken potential output. If businesses conclude that water-related disruption is no longer exceptional, higher expected costs may become embedded in prices and supply-chain strategies.

Water-related inflation can also have distribution effects. Food, water and energy represent a larger share of expenditure for lower-income households. Even when the impact on aggregate inflation is moderate, the social and political consequences may be material.

Central banks therefore need to understand the nature and persistence of water-related supply shocks, their interaction with inflation expectations, and their implications for the balance between inflation and economic activity.

2.2. Water and financial stability

The financial-stability implications of water shocks extend across established categories of risk.

Credit risk can increase when firms lose revenue, face interruptions or incur additional costs because of water scarcity, flooding or pollution. Borrowers may be directly dependent on water or indirectly exposed through suppliers, customers, energy systems and transport networks.

Market risk can arise when investors reprice companies, sectors, sovereigns or regions in response to new information about water exposure. Assets that appear valuable under assumptions of stable access to water may become impaired when physical constraints, regulation or social opposition are recognised.

Insurance risk can increase through flood claims, business interruption and the deterioration of insurability in repeatedly affected areas. If insurers raise premiums, restrict coverage or withdraw from certain markets, risk is transferred to households, businesses, banks and, in some cases, governments with consequences for public finances.

Operational risk may also arise. Financial institutions depend on buildings, electricity, telecommunications, data centres and service providers that can be affected by flooding or water shortages.

Legal and reputational risks are becoming more important. Firms may face litigation, penalties or loss of public trust when their operations contribute to pollution, ecosystem degradation or conflicts with community water needs. The financial institutions that lend to or invest in those

firms may face secondary exposure. Central bank analysis has emphasised that nature-related risks are material financial risks that should be assessed, analysed and managed in the same way as other potentially significant risks.

The critical point is that the environmental driver of a risk does not place it outside a central bank's mandate. A drought is a physical event, but its financial consequences may appear as credit losses, market repricing or inflation. Pollution is an environmental problem, but it can generate operational, legal and reputational risk. Nature degradation may begin outside the financial system yet enter it through familiar balance-sheet channels.

Mandate relevance should therefore be determined by the economic and financial consequences of the risk, not by the disciplinary label attached to its origin.

3. PILLAR 2. WATER IS A KEY TRANSMISSION CHANNEL BETWEEN CLIMATE CHANGE, NATURE DEGRADATION AND THE FINANCIAL SYSTEM

Water occupies a distinctive position in the emerging analysis of nature-related financial risks. It is simultaneously a natural asset, an essential ecosystem service, a factor of production and a channel through which climate change could become economically visible.

Water is indeed one of the clearest examples of the climate-nature-economy nexus.

3.1. From ecosystem degradation to economic disruption

Economies depend on nature through provisioning, regulating and supporting ecosystem services. These include the provision of food, water, timber and biological materials, as well as pollination, water filtration, climate regulation, flood protection, soil formation and disease control.

These services do not always have explicit market prices, but their absence can generate substantial economic costs. Wetlands can absorb excess water and reduce flooding. Forests and healthy soils can regulate the timing and quality of water flows. Aquifers can provide buffers during dry periods. When these ecosystems are degraded, the economy may lose forms of natural infrastructure that were previously available at little or no direct financial cost.

Research and policy work presented by central banks increasingly recognise that economic activity depends on natural resources such as water and on the wider services provided by nature. The NGFS Conceptual Framework (NGFS, 2024) was developed in part to establish a

common language for translating these dependencies and impacts into economic and financial risks.

Water helps make this relationship tangible. The degradation of a wetland can increase flood losses. Deforestation can affect water retention and sedimentation. Soil degradation can reduce agricultural productivity and increase irrigation needs. Pollution can convert physical water availability into economic scarcity by making water unsafe or too costly to use.

Nature-related financial risk does not mean biodiversity risk in a narrow sense. It encompasses the economic consequences of changes in the status of ecosystems and the services they provide to the economy.

3.2. The importance of dependencies and impacts

The NGFS framework distinguishes between an economy's dependencies on nature and its impacts on nature.

A dependency exists when an economic activity relies on an ecosystem service. Agriculture depends on water availability, soil quality and pollination. Hydroelectric production depends on river flows. Industrial facilities may depend on water for cooling, cleaning or processing.

An impact arises when an economic activity changes the state of nature. A company may pollute a river, deplete groundwater or alter an ecosystem through land occupation.

Dependencies and impacts are interconnected. An economic activity may degrade the ecosystem service on which it relies. The financial consequences can emerge immediately through physical disruption or later through regulation, litigation, changing consumer preferences or social conflict.

This feedback effect distinguishes nature-related financial risk from a simpler model of external shocks. The economy is affected by nature degradation, but economic and financial decisions can contribute to that degradation, which can in turn increase future financial risks.

3.3. Physical and transition risks

Nature-related physical risks arise from the degradation of ecosystems and their services. For water, these include shortages, deteriorating quality, altered flows, flooding and the loss of natural water regulation.

Transition risks arise from the responses of governments, markets, firms and society to nature degradation. New pollution standards, restrictions on extraction, changes in water tariffs, restoration requirements, liability regimes or shifts in consumer behaviour can affect company costs and asset values.

The distinction is analytically useful but should not imply that the two forms of risks are independent. Delayed policy action may increase physical damage and eventually require a more abrupt transition. Conversely, poorly designed policies can create unnecessary economic disruption without adequately reducing physical vulnerability.

Uncertainty about future policy can itself become a source of risk. If firms do not know whether water restrictions, pollution standards or restoration obligations will be introduced, they may delay investment. When policy ultimately changes, adjustment may be more sudden and costly.

3.4. Modelling effects of nature degradation

Nature-related risks are difficult to model because ecosystems can respond nonlinearly. A gradual increase in pressure may produce limited observable effects until a threshold is crossed, after which ecosystem services deteriorate rapidly.

Water shocks can also be combined with other risks or happen in a sequence. Drought may increase wildfire risk. Wildfire may damage soils and vegetation. Subsequent rainfall may then produce erosion, pollution and flooding. Low river levels may simultaneously constrain transport, power generation and industrial cooling.

These interactions matter for financial stability because they increase the possibility of correlated losses. A drought affecting a region may impair farms, food processors, energy companies, industrial firms, households and local authorities at the same time. The resulting losses may appear across loans, bonds, equities and insurance claims.

The NGFS stresses that climate change and broader nature degradation should not be analysed in isolation. Its conceptual framework is intended as a first step towards an integrated assessment of climate and nature-related risks, reflecting the scientific evidence that the two crises are deeply interconnected.

For central banks, the implication is clear. Water should not be treated as a narrowly environmental variable. It is a transmission mechanism connecting climatic conditions, ecosystem health, economic production and financial balance sheets.

4. PILLAR 3. MATERIALITY MUST BE ASSESSED THROUGH LOCATION-SPECIFIC, FORWARD-LOOKING AND SYSTEM-WIDE ANALYSIS

The recognition that water matters does not mean that all water-related risks are material for financial institutions. Prudential action should be grounded in a detailed assessment of exposures, vulnerabilities and transmission channels.

Formalising materiality is therefore a major task for central banks and supervisors.

4.1. From environmental indicators to financial variables

A financial institution does not need only to know whether a borrower uses water. It needs to understand whether access to water is critical to that borrower's operations, whether alternatives exist, how exposed the relevant location is, and how a disruption would affect cash flow, asset value and debt-servicing capacity.

This requires a sequence of analysis:

1. identify the economic activity's dependencies and impacts;
2. locate the relevant assets, facilities and supply chains;
3. assess the condition and likely evolution of the relevant ecosystems;
4. translate environmental disruption into economic effects;
5. translate those economic effects into financial risk;
6. examine whether exposures are concentrated or correlated across the financial system.

The NGFS Conceptual Framework follows this logic. It connects sources of physical and transition risk with impacts on the economy and then with conventional financial-risk categories. It includes two illustrative applications to freshwater and forest ecosystems, demonstrating how the framework can be applied to specific forms of nature dependence. Additional illustrations are to be published in a compendium in October 2026.

4.2. Location is key

Water is highly location-specific. A litre of water used where abundant does not create the same dependency or impact as a litre used where severely stressed.

Company-level averages can consequently be misleading. A diversified corporation may report a moderate global water footprint while operating one strategically important facility in a highly vulnerable area. A bank may appear to have limited exposure to water-intensive sectors while holding substantial credit concentrations in a region exposed to drought or flooding.

Geospatial information is therefore essential. Financial exposures should, where possible, be linked to the locations of borrowers' assets, operations, major suppliers and collateral. This is more demanding than conventional sectoral analysis, but without such information material risks may remain hidden.

4.3. Forward-looking analysis is required

Data is incomplete not provide a sufficient guide to future risk. Climate change, ecosystem thresholds, infrastructure deterioration, population growth, technological development and regulatory responses may alter the frequency and scale of events.

Scenario analysis can help institutions explore plausible futures without requiring precise forecasts. Scenarios may examine prolonged drought, severe flooding, restrictions on extraction, pollution-related closures, changes in water costs or the deterioration of ecosystem services.

Scenarios need also to consider interactions. For example, a drought may reduce agricultural production and hydropower at the same time, while low river levels disrupt transport. The aggregate effect may be larger than the sum of shocks modelled independently.

The NGFS is tentatively developing scenarios and modelling tools for nature-related financial risks, but the field remains less mature than climate-risk analysis. Its 2026 package provides work on nature-related data, modelling tools and supervisory practices (NGFS, 2026a), while explicitly acknowledging the challenges created by data gaps, complexity and the absence of universally applicable metrics.

4.4. A system-wide perspective

Microprudential analysis asks whether an individual institution is resilient and able to face stressed situations by itself to a high extent. Macroprudential analysis considers whether common exposures, interconnections or responses could destabilise the financial system.

This distinction matters for water. An individual bank may diversify its exposure by reducing lending to water-intensive sectors. If many institutions respond in the same way, however, vulnerable but economically essential sectors may lose access to the funding required for adaptation.

Similarly, insurers may protect their solvency by withdrawing coverage from flood-prone areas. At the level of each firm, that response may be rational. However, at the system level, it may weaken collateral values, raise bank losses and transfer liabilities to the public sector.

Central banks therefore need to analyse not only first-round losses but also amplification channels, including:

- common portfolio exposures;
- geographical concentration;
- insurance withdrawal;
- falling collateral values;
- fire sales and market repricing;
- the migration of losses to sovereign balance sheets;
- feedback between reduced investment and greater physical vulnerability.

Materiality is not determined solely by the aggregate value of an exposure. It also depends on concentration, substitutability, timing and the existence of thresholds. A relatively small sector can be systemically important if it supplies a critical input to many other sectors.

4.5. Acting in an uncertain world

Nature-related analysis is affected by significant data and modelling limitations. Yet uncertainty cannot justify postponing necessary action. Prudential supervision routinely addresses risks for which probabilities of occurrence and consequence upon materialisation are difficult to estimate.

The appropriate response is proportionate and iterative. Authorities can begin with qualitative assessments, exposure mapping, targeted reviews and exploratory scenarios. Methods can become more sophisticated as information improves.

The NGFS has explicitly concluded that the lack of absolute certainty or perfect knowledge should not prevent action, particularly when delay could produce a “too little, too late” outcome.

The standard should therefore not be perfect quantification. It should be decision-useful analysis that is transparent about assumptions, limitations and uncertainty.

5. PILLAR 4. NATURE-RELATED RISKS SHOULD BE INTEGRATED INTO EXISTING PRUDENTIAL FRAMEWORKS

Central banks and supervisors rightfully resist the creation of an entirely separate prudential architecture for every environmental issue. Nature-related risks are drivers of conventional risks and should therefore be incorporated into established frameworks whenever they prove material. This approach is both conceptually sound and operationally efficient.

A water-related shock may manifest as credit risk, market risk, insurance risk, liquidity risk, operational risk or legal risk. The supervisory question is therefore whether institutions identify, assess and manage these risks appropriately.

5.1. Governance and strategy

Boards and senior management need to understand their institution’s material dependencies on climate and nature-related factors. Responsibilities need to be clearly allocated, and relevant considerations must be included in strategy, risk appetite and internal controls in an effective way.

Financial institutions are to be able to explain where material exposures are concentrated and how they influence business decisions. Governance cannot be limited to policy statements. It should affect credit standards, portfolio management, client engagement, capital planning and operational-resilience arrangements.

5.2. Risk identification and monitoring

Banks may need to incorporate location, sector, water dependency and adaptive capacity into borrower assessments. Insurers may need to examine the implications of repeated flooding for pricing and insurability. Asset managers may need to consider whether valuations adequately reflect exposure to scarcity, regulation, litigation and ecosystem decline.

A proportionate approach remains essential. Not every small financial institution requires an advanced global nature model. However, a small institution concentrated in an exposed agricultural or coastal region may face substantial risk and should not be exempt merely because of its size.

5.3. Supervisory assessment

Supervisors can use a range of tools, including thematic reviews, questionnaires, portfolio analysis, scenario exercises, on-site inspections and discussions with boards.

The NGFS's 2026 note on nature-related supervision (NGFS, 2026a) proposes a pragmatic four-step approach that builds on existing climate supervision. Supervisory practices are emerging across advanced, emerging and developing economies, ranging from awareness-raising to requirements for concrete improvements in financial institutions' risk-management practices.

The NGFS's updated 2026 guide for supervisors (NGFS, 2026b) goes further by integrating climate and nature-related risks into a common prudential framework. It covers mandates, governance, organisational arrangements, exposure assessment, qualitative and quantitative analysis, scenarios, supervisory expectations and microprudential and macroprudential tools.

This integrated approach is preferable to regulatory fragmentation. Financial institutions should not be required to operate separate systems for climate, biodiversity, water and pollution when these risks are interconnected and transmitted through the same balance-sheet channels.

5.4. Data and disclosure

Supervisory effectiveness depends on decision-useful information. Companies and financial institutions need to disclose enough information to facilitate the assessment of material dependencies, impacts and exposures.

For water, relevant information may include:

- the location of significant facilities;
- dependency on water availability and quality;
- exposure to stressed basins;
- major sources of pollution or ecosystem impact;

- vulnerability of critical suppliers;
- adaptation and contingency plans;
- financial implications of restrictions or physical disruption.

Standardisation improves comparability and reduces reporting costs. Yet the value of common standards should not lead to excessive simplification. Because water is local, globally standardised metrics must be accompanied by geographically specific information.

The climate-disclosure work of the Basel Committee illustrates the direction of travel. Proposed disclosures have included sectoral exposures and exposures subject to physical risk by geographical area. While designed for climate-related risks, the underlying logic is also relevant to nature and water: risk assessment requires information about both economic activity and location.

5.5. Legal and reputational risks

Supervisors also consider nature-related litigation and conduct risk. Legal claims may concern pollution, corporate responsibility, misleading sustainability statements or failures to manage foreseeable environmental harm. Financial institutions need to identify plausible legal exposures and assess whether governance, due diligence and disclosures are adequate.

The expansion of nature-related litigation can create direct financial costs and accelerate the repricing of assets. It can also affect the responsibilities of central banks and supervisors themselves when the financial implications of nature degradation become increasingly established.

The objective of supervision is not to penalise exposure to environmentally sensitive sectors as such. It is to ensure that material risks are understood, governed and managed, and that the financial system remains resilient and able to perform its service to the real economy at all times.

6. PILLAR 5. POLICY OBJECTIVES TO SHIFT FROM MEASURING RISKS TO BUILDING RESILIENCE

Risk measurement is necessary, but not sufficient.

A financial institution may reduce its exposure to water risk by selling assets, restricting lending or withdrawing insurance. Such actions may improve its individual risk indicators while

leaving the underlying economic vulnerability unchanged. In some cases, they may make that vulnerability worse by reducing access to the capital needed for adaptation.

The strategic objective should therefore be to move from risk recognition to resilience.

6.1. What resilience means

Economic resilience is the capacity to absorb shocks, adapt to changing conditions and continue providing essential functions. In the context of water, it may involve:

- maintaining and modernising water infrastructure;
- reducing leakage and inefficient consumption;
- improving wastewater treatment and reuse;
- adapting agricultural and industrial processes;
- protecting buildings and transport networks against flooding;
- restoring wetlands, forests, soils and river systems;
- improving emergency planning and business continuity;
- diversifying supply chains and sources of water.

Some measures reduce immediate financial exposure. Others strengthen the underlying ecosystems on which economic activity depends.

The two dimensions are connected. Engineered infrastructure can be indispensable, but nature-based solutions may provide complementary protection. Wetland restoration, improved soil management and forest protection can contribute to water retention, filtration and flood attenuation while producing wider environmental benefits.

6.2. The private sector's role

Public finance alone is not sufficient to meet the scale of investment required. Private companies and financial institutions must also play an active role.

Companies need to identify not only their water consumption but also their critical dependencies, local impacts and exposure through supply chains. They are to develop credible adaptation plans and incorporate water constraints into investment decisions.

Banks can support resilience through lending, client engagement and the assessment of adaptation plans. Investors can distinguish between firms that are merely exposed and those that are actively reducing vulnerability. Insurers can provide risk expertise and incentives for prevention, if coverage remains appropriately designed and priced.

Public authorities can help mobilise capital through clear regulation, project preparation, guarantees, blended finance and reliable information. Public intervention may be particularly important where projects generate substantial public benefits that cannot be fully captured by private investors.

The purpose is not to protect every existing activity regardless of its environmental impact. Some activities may be incompatible with sustainable water conditions in specific locations. Financial institutions will need to distinguish between credible adaptation, the transfer of impacts to others and business models that are no longer viable or will cease to be.

6.3. Avoiding maladaptation

Resilience investments need to be carefully evaluated. A project that secures water for one industrial user may reduce access for competitors, households, agriculture or ecosystems. New infrastructure may create environmental damage or lock economies into unsustainable patterns of consumption.

This is why basin-level governance and engagement with affected communities are important. Water resilience cannot be assessed solely at the level of an individual asset or company.

Central banks and supervisors are not responsible for selecting individual projects. They can nevertheless encourage financial institutions to consider whether adaptation plans are credible, comprehensive and consistent with long-term physical constraints.

6.4. International coordination

Water risks are local in their physical manifestation but global in their economic transmission. Food markets, supply chains, migration, trade and financial portfolios connect water-stressed regions with the rest of the world.

International coordination is therefore essential. The NGFS contributes by developing common concepts, supervisory practices, scenarios and analytical tools. It has established nature-related risk as a dedicated area of work, with priorities including scenario development, practical implementation of its conceptual framework and the integration of nature considerations across its wider activities.

Coordination should aim to prevent unnecessary fragmentation. Common principles, terminology and baseline expectations would improve comparability. At the same time, national implementation must reflect differences in ecosystems, financial systems, institutional mandates and levels of development.

6.5. Building conviction

None of this can progress without sustained political and institutional conviction.

Within specialised communities, the financial relevance of water and nature degradation is increasingly recognised. Outside them, the agenda competes with many urgent economic, social and geopolitical concerns and may lose momentum.

The call for action must therefore be expressed clearly, and rely on evidence rather than principles or general statements. It should explain for example how water-related risks affect prices, production, employment, public finances, borrowers and financial institutions. It should also distinguish between the responsibilities of the various stakeholders, those of governments and those of central banks.

Communication should make risk tangible. Visible cases of water pollution, flooding or competition between households and industrial facilities can help demonstrate the economic and social significance of the issue. They should be connected to robust analysis of materiality and transmission.

Central banks have a particular responsibility to communicate with precision. Their credibility depends on the remit of their mandates and on recognising uncertainty. At the same time, their credibility would be weakened if they ignored risks that are becoming increasingly relevant to price and financial stability.

7. CONCLUSION

Water is becoming a central macrofinancial issue. It is a fundamental input into production, a critical ecosystem service and a transmission channel linking climate change, nature degradation and the economy. Its scarcity, excess or pollution can reduce output, raise prices, impair assets and weaken borrowers. These effects can appear in the financial system as credit, market, insurance, liquidity, operational, legal and reputational risks.

The relevance to central banks and supervisors follows from these transmission channels. It does not depend on expanding their mandates into environmental policymaking. Governments

must continue to lead on environmental objectives, infrastructure, taxation, regulation and distributional choices. Central banks and supervisors must act where environmental developments affect monetary and financial stability.

The analytical agenda remains demanding. Data are incomplete, modelling is still at an early stage of development and ecosystem responses are complex. There is no single metric comparable to greenhouse-gas emissions, and no universal transition pathway can capture the diversity of water systems and local ecological conditions. The NGFS recognises these limitations while encouraging central banks and supervisors to advance through pragmatic, proportionate and iterative action.

Action must be now. Waiting for perfect information would be neither realistic nor prudent. Central banks are used to making decisions in an uncertain environment. The appropriate response is to improve data and methods while acting on risks that are already sufficiently visible and potentially material.

Water should therefore not be presented as another burden imposed on institutions already working on climate risk. It is one of the principal channels through which climate and nature-related pressures become economically and financially relevant. Integrating it into forecasting, financial-stability analysis, supervision and investment planning will improve, rather than dilute, existing risk frameworks.

The strategic direction can be summarised in a straight-forward manner: central banks and supervisors need to help move the financial system from risk recognition to resilience. That transition will require analytical rigour, supervisory clarity, international coordination, private-sector mobilisation and credible public policies.

Above all, it will require conviction work. The financial implications of water and nature degradation are to be communicated beyond the specialist community, supported by evidence and in line with mandates: stable prices, sound financial institutions and resilient economies.

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