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Water Integrity Research

INTEGRITY RISKS IN WATER AND SANITATION CLIMATE ADAPTATION

Working Paper

WIN Water Integrity Network

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Climate adaptation is a fast-changing field of study with a need to engage on new definitions and concepts. In this paper, we propose definitions and frameworks to better apprehend the way integrity affects, and is affected by, climate dynamics. This paper is a basis for further research and debate, in the run up to the development of the next edition of the Water Integrity Global Outlook. We welcome discussion, feedback, and ideas for further investigation.

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Note:

The Water Integrity Network (WIN) advocates for integrity in the water and sanitation sectors to reduce corruption risks and improve services, for the benefit of all. Access to safe water and sanitation are fundamental human rights. Our goal is to contribute to the realisation of these rights, as well as ensure the sustainable use of water resources in the face of the climate crisis.

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INTRODUCTION

Striking images of floods and relentless stories of water scarcity serve as constant reminders of the challenges posed by climate change. It is crucial to ensure that both communities and the water and sanitation systems they depend on are resilient in the face of these events. This working paper focuses on **a key opportunity for improving the effectiveness of adaptation in the water and sanitation sectors—proactively identifying and addressing integrity risks.**

Reports from the Intergovernmental Panel on Climate Change (IPCC) have repeatedly, and each time more forcefully, set out how the climate is changing and how it will devastate our planet. Extreme temperatures and changes to earth's systems increase incidences of water scarcity and drought, floods, rising temperatures and other climatic crises. As climate change impacts worsen, scientists warn of tipping points that will cause systems to collapse and allow the effects to grow explosively. However quickly or disastrously climate change impacts manifest, there is no question that they will have a devastating effect on entire populations' environments, lives and livelihoods (IPCC, 2023).

Despite nearly three decades of annual climate negotiations at the Conference of Parties (COP), global leaders have failed to take the decisive action needed to limit warming to 1.5°C. Governments continue to pledge emission reductions yet consistently fall short of their own targets, making dishonest pledges that they cannot or will not keep. The failure to meet these targets, and the severe impact of climate change on countries that have done little or nothing to cause it has brought climate justice to the forefront—where it rightfully belongs.

The impacts of climate change are exacerbated by precarious livelihoods and poverty; physical vulnerabilities due to the location or type of housing and lack of reliable and resilient infrastructure; often little or no early warning or adaptation measures taken by government; and/or a government that is unresponsive to its poor population. Climate justice recognises "the disproportionate impacts of climate change on low-income communities and communities of colour around the world, the people and places least responsible for the problem. It seeks solutions that address the root causes of climate change and in doing so, simultaneously address a broad range of social, racial, and environmental injustices." (Center for Climate Justice, n.d.)

Adaptation is essential to protect people, particularly those most vulnerable, and the management of water and sanitation plays a crucial role. In the context of climate justice, the debate is not simply about the effectiveness of various adaptation actions, but about the very systems within which the actions are taken. As set out in 110 essays in Pluriverse (Kothari et al., 2019), adaptation actions can be grouped into those that are reformist, seeking solutions through adjustments to existing systems, and those that are transformative, developing new approaches to change the socio-economic systems that created and perpetuate the climate crisis.

Financing is another crucial element of the debate. Developing countries need an estimated USD 215 billion to 387 billion in adaptation finance per year this decade, which is 10-18 times as great as international public finance flows (UNEP, 2023). Within present allocations, finance for the water and sanitation sectors makes up only a small share of total climate funding. From 2016 to 2020, such projects accounted for just 3% of total climate finance (Mason, 2020; UNEP, 2023).

Already we know that current climate adaptation finance, and water and sanitation adaptation finance, is not sufficient to protect populations, particularly in the world's most vulnerable regions. Worse still, much of this funding comes as loans rather than grants, deepening the debt burden on vulnerable nations and further limiting their ability to respond to climate impacts (Rahman and Verhagen, 2023).

Significant financial and other support from countries responsible for driving climate change is required for both adaptation and loss and damage. While the UN has no official definition of 'loss and damage', which remains contentious in COP negotiations, the World Resources Institute (2024) describes it as the "consequences of climate change that go beyond what people can adapt to". In other words, it is where there are no "reasonable prospects for avoiding intolerable risks", or "situations where adaptation options exist, but a community doesn't have the resources to access or utilize them" (WRI, 2024). In many ways, loss and damage highlights the existential threat to poor countries, which explains why they have lobbied for it as an important element of current COP negotiations.

Given the high stakes of addressing loss and damage and the limited time and funding for adaptation**, it is essential to ensure that funds are spent effectively**. Where climate finance is forthcoming, there is a high risk of corruption: sums are large, new actors are involved, pressure to deliver fast is high, and adequate controls may not be in place. It is important to consider what can go wrong and how to intervene to ensure that projects deliver on their intended objectives.

Work by the Water Integrity Network (WIN) and partners can make an important contribution in doing so. The network focuses on integrity, defined as: "using vested powers and resources ethically and honestly, ensuring services and resources go where they are intended and most needed." (WIN, 2022).

In cooperation with the Green Climate Fund (GCF), WIN showed how lack of integrity in the implementation of adaptation projects can severely undermine their intended impacts. Such lack of integrity may result in maladaptation, whether by exacerbating existing vulnerability, creating new vulnerabilities, or displacing vulnerability to a new group (GCF, 2021), now or in the future.

This working paper provides an assessment of integrity risks in water and sanitation climate adaptation that must be addressed to ensure more sustainable, equitable and effective adaptation and service delivery outcomes. It asks: **How can we understand and characterise integrity risks in water and sanitation climate adaptation that undermine its effectiveness, and what does this mean for organisations working on water and climate adaptation?**

The overall aims of this working paper are to engender discussion and to influence work by WIN, its partners, and allies on the issue of water and sanitation climate adaptation and integrity, to identify integrity risks that can undermine adaptation and result in maladaptation, and to identify measures that can be taken to reduce such risks. It seeks to provide a practical basis for stakeholders to formulate proactive strategies to mitigate integrity risks.

Section one of this working paper proposes a definition of adaptation in relation to water and sanitation. Section two considers what happens when adaptation goes wrong and provides case studies illustrating the impact on people's vulnerability. Sections three, four and five present three types of integrity risks that can arise in water and sanitation adaptation: climate washing as a misrepresentation of adaptation; corruption and mismanagement in different stages adaptation projects/programmes; and malpractice, or failure to adhere to good practices for adaptation and development. Section six draws the paper to a close with some preliminary recommendations.

In terms of method, literature on adaptation, with a particular focus on water and sanitation, provided a basis for defining and utilising concepts. Sources were considered through a lens of integrity, based on WIN's previous work on climate adaptation. Secondary sources provided the basis for case studies, which were identified through an open call to practitioners and in existing literature.

1 DEFINING WATER AND SANITATION ADAPTATION

This section discusses adaptation as a part of resilience and its relationship to development. It offers a definition of water and sanitation adaptation, noting that the topic is complex on many levels: scale of the intervention, geographical level, type of intervention, period of time considered, and interactions between these.

1.1 Adaptation as a crucial part of resilience

Climate resilience has become a central focus of discussions and resources related to addressing climate change. Resilience refers to the "capacity of social, economic and ecosystems to cope with a hazardous event or trend or disturbance, responding or reorganising in ways that maintain their essential function, identity and structure", or their ability to 'bounce back' (IPCC 2022).

The IPCC's (2022) use of the term adaptation gives us a basis to explore the concept more fully, particularly in terms of water and sanitation: adaptation refers to a "process of adjustment to actual or expected climate change and its effects in order to moderate harm or take advantage of beneficial opportunities". When supported by external interventions, adaptation refers to a "wide range of measures to reduce vulnerability to climate change impacts" (UNDP, 2024). While there is no single, universally agreed-upon definition of vulnerability to climate change, it can be understood as the intensity of climate-related effects, along with the propensity of people and places to experience harm, shaped by factors like institutional, social, historical, and economic conditions, as well as adaptive capacity (e.g. local knowledge, social networks) (Piggot-McKellar et al., 2020).

Climate adaptation serves as the practical pathway by which societies bolster their climate resilience. By continuously adapting to evolving risks, societies not only reduce immediate vulnerabilities but also cultivate the long-term capacity to absorb, recover from, and potentially even thrive amid future climate shocks.

However, for people who are already deeply vulnerable or impoverished, this status undermines their resilience to climate change impacts. For example, "In Southern Africa, it is precisely high levels of inequality in water access and governance, and therefore in adaptive and transformative capacity, that systematically undermine resilience, both state and community-led, to water-related risks." (Rodina et al., 2017). This concern is not limited to Southern Africa; it has been discussed even more powerfully in India (Bahadur and Tanner, 2014) and such dynamics can be expected to apply globally. Development is, therefore, a key element of adaptation and building climate resilience.

1.2 Adaptation and its relationship to development

This paper supports the argument that adaptation needs to go hand in hand with development, and that **people tend to be more vulnerable in places where there has been a lack of development**, thereby potentially also increasing the need for adaptation. As Schaer (2015) explains in the context of Dakar, Senegal:

"Adaptation is not a panacea per se, as it may not, by itself, compensate for the lack of basic services and infrastructure that is forcing the urban poor to cope with disproportionate levels of risk."

Historically, development initiatives often overlooked climate considerations, focusing primarily on economic growth and poverty reduction. In parallel, work on climate adaptation was more singularly focused on addressing the impacts of climate change (Schipper 2007). As these impacts have grown in severity, especially in developing countries, the need to integrate adaptation strategies into development planning has become increasingly evident. Today, there is better recognition that climate adaptation and development are deeply interconnected. To successfully achieve climate adaptation, underlying causes of vulnerability —those that development often seeks to change—must be addressed (Schipper 2007).

This interconnection is reinforced by calls to ensure 'climate-compatible development' that "minimises the harm caused by climate impacts, while maximising the many human development opportunities presented by a low-emissions, more resilient, future" (Mitchell and Maxwell, 2010). In practice, there is no "clear distinction between what qualifies as exclusively adaptation or development" (Schipper et al., 2020). Whatever the context, all populations are certain to face the impacts of climate change. However, people with reliable access to water for domestic and productive purposes, and to decent sanitation, are generally better prepared to cope with the impacts of climate change than those without.

Despite this, there continues to be a debate about ensuring that adaptation funding is new and supports work that is 'additional' to work that was planned or underway in any case, and that it 'adds on' elements that will prepare people for climate change impacts (Brown et al., 2010). Some critics argue that adaptation funding is used on work that would have been done anyway and is a 'diversion of existing adaptation finance' (Klein, 2010). Still, it is often not possible to ascertain what the 'additional component' may be. This debate is evident in some case studies provided later in this paper, in which governments are keen to access development finance and package the activities as climate adaptation to access different types of funds or to try and demonstrate climate-focused action.

After more than a decade, of seeking to identify 'new' or 'additional' activities that could be labelled adaptation as differentiated from development, there is now more widespread acceptance that **climate adaptation must adopt the developmental aim of addressing underlying causes of vulnerability.**

1.3 Linking adaptation with water and sanitation

One of the impediments to improving water and sanitation adaptation is that there has been little attempt to define it. Due to its 'perceived obviousness', practitioners have focused on specific details rather than examining its nature more fully. This has led to "unresolved ambiguities and assumptions about the concept". In other words, due in part to a vague and varying understanding, decision makers and practitioners have been unable to move past generalisations and surface engagement on what water and sanitation adaptation really means. (Orlove, 2022) Once we understand the specific links between adaptation and water and sanitation, we can assess where this can go wrong, and what integrity risks need to be addressed.

We propose a **working definition of water and sanitation adaptation to refer to the process of adjusting water resources, water supply and sanitation management and systems to minimise the potential negative impacts of climate change.** It may require modifying infrastructure, policies and practices, or adjusting interactions with the natural environment in anticipation of the expected impacts or challenges resulting from increased water scarcity, flooding, rising temperatures, and unpredictable rainfall patterns. Such actions may take place at the transboundary, national, sub-national or very local level and must embrace ecosystem functioning, infrastructure needs, and adaptive service delivery.

Table 1 below provides a non-exhaustive list of how climate change can lead to changes in water resources and water and sanitation services, and of the risks that emerge. It is important to be specific since, arguably, one reason why water and sanitation adaptation may receive relatively little climate adaptation funding is that it is 'lost' within wider efforts to address climate change, and many people working in this space are not clear about the range of important work that water and sanitation adaptation requires and how it contributes to other climate goals.

Table 1: Examples of climate variability and change effects on water resources, water supply and sanitation systems (WIN, expanded from WHO, 2019:7)

Climate change effect	**Potential hazards and changes**	**Examples of risks (and benefits) for sanitation systems**	**Examples of risks (and benefits) for water supply systems**	**Examples of risks (and benefits) for water resource systems**
More intense or prolonged precipitation	Increased flooding	Destruction and damage to sanitation infrastructure	Destruction and damage to water supply infrastructure	Destruction and damage to water resources infrastructure (e.g. irrigation, dams, pipelines etc) Possibility of storage of flood waters to increase water availability in dry periods Changes in ecosystem functioning

	Increased erosion, landslides	Damage to other infrastructure / systems on which sanitation systems rely (e.g. electricity networks for pumping; road networks used by FSM vehicles)	Damage to other infrastructure / systems on which water supply systems rely (e.g. electricity networks for pumping; road networks used by water tankers)	Damage to other infrastructure / systems on which water resource systems rely (e.g. electricity networks for opening dam gates; monitoring devices)
	Contamination of and damage to surface water and groundwater supplies	Flooding of on-site systems causing spillage and contamination	Contamination of water supply	Contamination of water resources
	Changes to groundwater recharge and groundwater levels	Flooding and collapse of pit latrines, including via groundwater	Increased groundwater recharge	Increased groundwater recharge
		Overflow and/or obstruction of sewerage and septic systems	Increases in suspended solids loads in rivers reducing effectiveness of chlorination and other disinfection systems	Increased pollution of freshwater systems with impacts on human and ecosystem health
		Floating of septic systems due to groundwater levels	Increases in suspended solids loads in rivers reducing effectiveness of chlorination and other disinfection systems	Increased pollution of freshwater systems with impacts on human and ecosystem health
		Treatment plants receive flows that exceed their design capacities, resulting in flows bypassing the treatment processes	Increases in suspended solids loads in rivers reduce effectiveness of chlorination and other disinfection systems	- Increased pollution of freshwater systems with impacts on human and ecosystem health
More variable or declining rainfall or run-off	Longer dry seasons / periods	Declining water supply impeding function of water-reliant sanitation systems (e.g. flush toilets, sewerage, treatment)	Reduced water availability	Reduced water availability
	Droughts (both seasonal and longer-term)	Greater distance between pit latrine pollutants and groundwater levels, beneficially allowing for pathogen attenuation	Increased concentration of pollutants	Increased concentrations of pollutants
	Reduced surface water flows	Obstruction creating reduced capacity in rivers or ponds that receive wastewater	Abstraction points above water level	Reduced water availability and impacts on ecosystem functioning
	Reduced groundwater levels / resources	Increased reliance on wastewater for irrigation which, if not adequately managed, can increase health risks	Water table below abstraction levels	Reduced base flow in rivers

		Increased corrosion of piped sewers	Leakage of sewage with potential cross-contamination of potable water	Increased pollution in ground surface water with impacts on human and ecosystem health
		Higher pollution concentration in wastewater and reduced capacity of receiving water bodies to dilute wastewater	Increases in suspended solids loads in rivers reduce effectiveness of chlorination and other disinfection systems	Increased pollution of freshwater systems with impacts on human and ecosystem health
		Ground movement in soils with high clay content leading to broken pipes and joints	Leakage of sewerage with potential cross-contamination of potable water	Increased pollution in ground surface water with impacts on human and ecosystem health
Sea-level rise	Saline intrusion in coastal / low-lying zones	See impacts from flooding above Reduced effectiveness of biological treatment processes due to saltwater exposure from saline intrusion into wastewater influent	See impacts from flooding above	Saline intrusion in coastal groundwater resources
	Rising groundwater levels in coastal / low-lying zones	Damage to underground infrastructure from rising groundwater levels	Saline intrusion in coastal groundwater resources	Saline intrusion in coastal groundwater resources and estuaries
	Higher risk of inundation, especially from extreme weather events (potentially contributing to flooding, erosion, landslides)	Damage to wastewater treatment works (low-lying / coastal) from exposure to saltwater	Damage to water treatment works (low-lying / coastal) from exposure to saltwater	Damage to water resources infrastructure and freshwater systems
Changes in temperature	Higher freshwater temperatures	Reduced efficiency of biological wastewater treatments (if temperature exceeds or falls below operational limits)	Enabled survival of pathogens or extension of their range and development of biofilms containing pathogens such as mycobacteria, Legionella, and Pseudomonas.	Negative impacts on freshwater ecosystems; altered vectors of water-borne diseases; changes in pollution interactions
	Hot and cold temperature extremes	Proliferation of algal blooms or microbes carried by vectors in water	Increased risks of cyanobacterial blooms requiring more advanced water treatment	Increased risks of cyanobacterial blooms

		Increased corrosion of sewers	Increased maintenance requirements for water supply infrastructure	Negative impacts on freshwater ecosystems; increased maintenance requirements for water resources infrastructure
		Quicker drying of faecal sludge in waterless latrines if increasing temperature is matched with drying conditions	Increased water demand from consumers	Increased water demand from consumers
More frequent or intense storms or cyclones	Increased flooding	See impacts from flooding above	See impacts from flooding above	See impacts from flooding above
	More extreme winds	Damage to latrine superstructures and other infrastructure	Damage to infrastructure	Damage to infrastructure
		Damage to other infrastructure / systems on which sanitation systems rely (e.g. electricity networks for pumping; road networks used by FSM vehicles)	Damage to other infrastructure / systems on which water supply systems rely (e.g. electricity networks for pumping; road networks used by water tankers)	Damage to other infrastructure / systems on which water resource systems rely (e.g. electricity networks for pumping; monitoring systems)

This list of potential impacts of climate change focuses on particular technical areas, **but water and sanitation adaptation is deeply embedded in complex social and political contexts, often referred to as the hydro-social cycle** (Linton and Budds, 2014). Power dynamics mean that climate impacts are experienced differently by different social groups, through the intersection of, for example, gender, race, class, religion, disability and age (Sultana, 2018). Aspects of governance, particularly power imbalances amongst water and sanitation users, are often ignored when technical issues are the main focus. Water scarcity, for example, is driven not just by climate and environmental factors, but also by inadequate or substandard infrastructure that can result from corruption and mismanagement, an unjust distribution of limited water to specific social or economic sectors, or the poor implementation of water allocation priorities. This is sometimes referred to as "manufactured" scarcity (Homer Dixon, 1999; Galvin and Kaziboni, 2022).

For adaptation interventions to be effective, they must therefore address not only the risks outlined in Table 1, but also governance, integrity risks, and the power dynamics within the sectors. Given the limited funding for water and sanitation adaptation, resources must also be used strategically and with integrity to ensure impact. While some projects may fail or have minimal effect—a common challenge in development—addressing integrity risks significantly increases the chances of effective adaptation.

2 UNDERSTANDING MALADAPTATION

2.1 Defining maladaptation

It is necessary, when considering adaptation, to also look at the other side of the coin: maladaptation. Maladaptation is not simply failed adaptation. Maladaptation is defined by the IPCC (2023) as "actions that may lead to **increased risk of adverse climate-related outcomes**, including via increased greenhouse gas emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future." Maladaptation signals clear negative consequences of adaptation policy and projects, irrespective of the actors' intentions.

Due to the potential for ambiguity, growing scholarship on maladaptation seeks to further define the term (see, for example, Barnett and O'Neil, 2010; Juhola et al., 2016; Magnan et al., 2016) and ground it in real-world examples. While there is some variation on definitions and typologies, what remains central to the concept is that maladaptation refers to negative impacts on vulnerability, as also spelled out in a policy brief on maladaptation by WIN and the GCF (2021). Under the themes of this working paper, we contextualise integrity failures in adaptation as potentially resulting in maladaptation in the following four ways: 1) exacerbating existing vulnerabilities, 2) creating new vulnerabilities, 3) displacing vulnerabilities to a new group and 4) worsening future vulnerability.

2.2 Case studies

The following case studies illustrate the four impacts of maladaptation on vulnerability. Although a lack of transparency, accountability and participation is evident to a greater or lesser extent in each of these cases, existing data does not make it possible to identify particular integrity failures that contributed to these outcomes.

Table 2: Adaptation projects' impact on vulnerability - cases

Location	**Adaptation project focus**	**Maladaptation: potential impact on vulnerability**
Andalusia, Spain	Responding to increased water demands in Andalusia	Exacerbated; Displaced
Afar, Ethiopia	Irrigation for agriculture and non-pastoral livelihoods in response to drought	Exacerbated; New
Uttar Pradesh, India	Embankment built against flooding (Ghaghara River)	Exacerbated
Bangladesh	Coastal climate-resilient infrastructure project Roads resilient to floods, and local adaptation	Future

Displacing vulnerability in Andalusia, Spain

The Andalusia region in southern Spain regularly faces extreme drought (Bostyn, 2025; Zarza, 2024). With climate change exacerbating its water crisis, local authorities are seeking to improve water savings (including in irrigation), access alternative sources of water, adopt desalination and even transportation of water in ships, and better monitor reuse and urban supply (Zarza, 2024). Aside from technical challenges, a number of these alternatives have faced significant local opposition (Boutroue et al, 2022; Winer, 2022).

One example relates to water saving, which was the focus of the five-year Rural Development Programme, supported by the European Union's Common Agricultural Policy from 2014 to 2020, in response to the region's vulnerability to climate change (European Commission, n.d.). The programme focused on the irrevocable lowering of water rights as a means to save water, even though this same measure had not "prevented the extension of irrigated areas or the approval of projects that imply an overall increase in water consumption" (Boutroue et al, 2022). Almost all agricultural unions and associations expressed massive opposition to how the proposed changes would exacerbate their existing vulnerability, and the water rights revision was abandoned in 2018.

Another example is a municipal plan to access aquifers in the UNESCO biosphere reserve, *Parque Natural Sierra de Aracena y Picos de Aroche*. Aiming to address water scarcity and increasing water demands from the domestic, tourism, and agricultural sectors, regional authorities planned to draw on the reserve's aquifer to construct a large-scale ring main and re-route water to larger municipalities facing water shortages (Winer, 2022; Rodriguez, 2022). The planned construction of a major dam and the drilling of wells near traditional water sources are seen as major threats to the flora and fauna of the reserve, as well as to local water security and to centuries old conservation and land use practices of local communities, who have expressed deep concerns about the project's potential to displace vulnerability onto them.

At the onset, the project advanced despite lacking full approvals from key regulatory bodies such as the Park and Water Authority, raising serious concerns about transparency and accountability in decision-making (Winer, 2022). In addition, the way that the project prioritises water access for wealthier and more powerful domestic users and commercial sectors at the expense of small-scale users has faced significant opposition. Local communities and environmental organisations, such as Ecologistas en Acción, actively protested the initiative, arguing that their concerns and perspectives were being disregarded (Winer, 2022).

The project now seems to be forging ahead: in early 2023, a public information period was opened and "various objections were raised regarding the project, which have been partially addressed" (Iagua, 2024). Consequently, in 2024, a new public information period of 30 days was opened. No information is publicly available from the Andalusian Government on which objections were originally raised, nor specifics about how they have been "partially addressed". Without proper oversight and dialogue with affected communities, there is a risk that choices made in the special interest of bigger municipalities with more economic power will overrun the environmental sustainability of the region and the well-being and resilience of local populations.

Exacerbating and creating new vulnerabilities in Afar, Ethiopia

Adaptation funding is an important source of funds for the Ethiopian government, which identified regular, severe droughts in Afar (a dryland area in Northeastern Ethiopia) as worsening with climate change and as an important focus for adaptation programmes. According to Lautze and Maxwell (2007 in Rettberg, 2010), food and livelihood insecurity for pastoralists changed from being temporary to chronic as a result of climate change.

In 2010 the Ethiopian government introduced the National Adaptation Programme of Action (NAPA) and invested in irrigated agriculture and non-pastoral livelihoods. The intention is to provide livelihoods in a drought-ridden area. The approach claims to decrease vulnerability by requiring people to move from pastoralism to irrigated agriculture, which is more likely to withstand climate impacts and produce higher yields. This is the vision of government, but not the reported experience or aim of pastoralists.

With this change, pastoralists (comprising 80% of the 1.4 million people living in the region) can no longer rely on livestock due to the loss of grazing land to agriculture. (Magnan et al, 2016) They were also evicted from the excellent grazing land along the Awash River due to inundation from two large dams built to irrigate sugarcane. The conditions for maintaining their pastoralist livelihoods have been fundamentally altered, creating new vulnerabilities, while their existing vulnerability to droughts has worsened (Rettberg, 2010).

Interviewed pastoralists explained that their main concerns were violence and negative relations with the state, and that they had adapted to drought for many years and were confident that they could do so in the future. This is recognised as "high adaptive capacity based on spatial mobility, and flexible use of dispersed pasture and water resources over space and time" (Lewis, 1969; Kassa, 2001 cited in Rettberg, 2010).

In addition to these challenges, climate adaptation finance appears to have been used despite some evidence that the plans were not, in fact, driven by adaptation needs. Rettberg (2010) argues that the government's narrative of drought is used to obtain funds that cover a substantial part of its operational development budget and that its real focus was on modernisation of agriculture. In this case, the choice to pursue the interests of some groups over others like the pastoralists, without even basic consultation, led to adaptation planning increasing, rather than decreasing, vulnerabilities.

Exacerbating vulnerabilities in Uttar Pradesh, northern India

There are more examples of adaptation projects prioritising the interests of the powerful or of certain sectors, and thus shifting vulnerabilities onto other groups, particularly the most marginalised and least visible, such as indigenous groups or people living in informal settlements. Consequences appear to be more acute when there is no attempt to work together to plan for climate adaptation, or to ensure transparency, accountability and participation from the very start of planning.

This is what occurred in Uttar Pradesh, northern India. Originating in Tibet's mountains and flowing through Nepal, the Ghaghara River—the largest tributary of the Ganga River by volume—makes Uttar Pradesh one of India's most flood-affected states. Around 721 villages in 21 districts were affected by floods in the state in 2023 (Hindustan Times, 2023).

According to the Uttar Pradesh State Management Authority, the annual damage to land as well as crops, houses and livestock that occur from floods in the state results in an estimated loss of Rs 432 crore (USD 49.9 million annually. Human lives are also lost. (Uttar Pradesh State Management Authority n.d.)).

Residents living close to the Ghaghara River, particularly those in the Baranbaki District, face devastating annual floods which destroy their crops and lands and carry away their homes. Many of these residents have relocated to cities for work, deeming that an agricultural livelihood along the river is no longer possible. Others cannot afford this move and try to cope with the annual flooding.

From 2013 to 2018, a 52 km long embankment was built to constrain the spread of floodwaters and to prevent the river from flooding inland villages and agricultural lands. Authorities claim that the embankment has saved 100,000 hectares of land from submersion. However almost 100 villages in three tehsils (Ramsanehighat, Ramnagar and Sirauli Gauspur) in the district of Baranbaki are trapped between the river and the embankment when floodwaters rise (Singh, 2022). While they have always been vulnerable to annual flooding, the construction of the embankment has subjected them to much more severe flooding and increased their vulnerability. Unable to afford either the construction of a new home or relocation, many of these villagers have found themselves physically and economically trapped as a result of lost homes and farmland. They are forced to spend at least three months of the year in makeshift tents on top of the embankment and many remain there permanently. This situation puts enormous pressure on women when families struggle to protect their food supplies and belongings, and children have difficulties getting to school (Singh, 2023).

Government is aware of the new problems that the embankment has created for the people living in Baranbaki. Residents hold that government has failed to provide compensation for their losses, while the Uttar Pradesh State Disaster Management Authority reports compensation of nearly USD 30,000 to residents in the area between 2017 and 2020. The State also claims to be seeking land to be allotted for relocation, to absolutely no avail for years. (Singh 2022)

While some victims may or may not have been compensated, many have not. As of 2024, politicians have promised three temporary shelters and relief support, but details remain unclear (Mullick, 2024). Many villagers believe these are just empty political promises, as their previous experience is that officials often turn up after the disasters, make appropriate noise, only to again disappear (Singh 2022).

The planning and construction of the embankment appears to have been done without sufficient engagement with affected communities. Decision makers also failed to consider or prepare for the project exacerbating vulnerability for residents between the embankment and the river. They did not consider trade-offs and systemic pressures of coping with a growing population (Lahiri-Dutt and Samanta, 2013). Accountability continues to be a major issue given the challenges that have arisen and the lacklustre response from government, even after the project's effects were clear.

Worsening future vulnerability in the southwest coastal region of Bangladesh

Short term or medium term 'successes' in reducing vulnerability through adaptation activities might worsen a population's long-term vulnerability. This can happen when adaptive activities erode conditions for further development, distract from what is needed for the future, or lead to an outcome that places groups more at risk than they would have been before (Magnan et al., 2016: 38-40; UNDP, 2015).

The coastal region of Bangladesh is one of the most climate-vulnerable areas in the world. There are indications that future extreme events and long-term sea-level rise expected from current rates of climate change are guaranteed to permanently affect coastal districts, whatever the design standards of the infrastructure. It is estimated that 35 million people could be dislocated by 2050 (Magnan et al., 2016).

National authorities and international donors are taking action to implement large-scale responses to these projected devastating impacts. The Coastal Climate-Resilient Infrastructure Project (2013-2019), funded by the Asian Development Bank (ADB), the International Fund for Agriculture and Development (IFAD), the KfW Development Bank, and the Government of Bangladesh, aimed to upgrade around 540 km of roads, bridges and culverts to improve resilience, reduce people's vulnerability, and provide more reliable access to markets. Intended outputs also included new cyclone shelters. The project was expected to reach about 600,000 households in 12 districts, including 3.5 million people described as very poor and vulnerable to natural disasters. There is little question that this project made sense in the short term to reduce risks from weather events including cyclones, tidal surges, and floods, as well as economic improvements. (IFAD, n.d.)

Magnan et al (2016: 46) use this project to illustrate the dangerous and insidious effects that such short-term adaptation strategies can have. In this case, they anticipated that residents may be encouraged to remain in hazardous locations. In-migration could even be ignited if economic benefits start to be seen. (Magnan et al, 2016) This can be described as 'palliative adaptation' which, although it reduces vulnerability temporarily, is almost guaranteed to worsen it in the future (Dickinson and Burton, 2014 in Magnan et al., 2016).

Despite good intentions, the project failed to identify, articulate or engage with trade-offs in short and long-terms impacts. As anticipated by Magnan et al (2016), in terms of short-term benefits, a project performance evaluation by IFAD (2021) concluded that the project had achieved access to markets and services and "significant increase in the numbers and activity of traders, producers, transport providers and other enterprises". It mentions that infrastructure was constructed "to a relatively good standard", without qualification or definition of what 'good standard' means in this context, and that it "has largely withstood monsoon flooding and extreme weather events."

According to the evaluation, local communities were also involved in infrastructure construction and management. However, there is no mention of authorities communicating possible long-term considerations or future steps with them. This includes raising the possibility of new infrastructure not withstanding increasingly severe climate impacts in the long term. Alerting, allowing and encouraging people to consider relocation does not seem to have been considered. Short-term impacts were considered, and the possible long-term consequences for residents' vulnerability were not.

2.3 The role of integrity in preventing maladaptation

This working paper has thus far defined water and sanitation adaptation and its parameters and provided cases of maladaptation that hint at deep governance and integrity issues.

Through a review and analysis of the literature on climate change adaptation, particularly focused on water and sanitation, WIN identified **three major types of integrity risks that are the focus of this report and that could increase the risk of maladaptation**. First, **misrepresentation**, or false claims in the conceptualisation and presentation of water and sanitation adaptation projects, often appearing in the form of greenwashing or climate-washing. A second set of integrity risks relates to **corruption and the misallocation and misuse of financing** along the climate adaptation project cycle. Finally, a third set of integrity risks relates to **malpractice** and the poor recognition or adherence to adaptation principles in planning and implementation of water and sanitation adaptation projects.

All three sets of integrity risks are inter-related. Acting on one may well have a positive impact on the others. Whatever the entry point, ensuring that adaptation is implemented with transparency, accountability, participation and specific anti-corruption measures is critical to achieving the objectives of adaptation. The sections below set out, explain and provide examples of these three types of integrity risks.

3 INTEGRITY RISKS: CLIMATE-WASHING

3.1 A form of greenwashing

According to the UN General Secretary (2022), greenwashing is a process of misleading the public to believe that a company or other entity is doing more to protect the environment than it is. Greenwashing can also refer to an organisation spending more resources to promote itself as green than it does to engage in environmentally sound practices (Melad, 2023).

U4 Anti-Corruption Resource Centre (2023) refers to greenwashing as a form of corruption:

"Greenwashing is based on some type of unsubstantiated claim with the aim to either deceive relevant stakeholders into believing that actions/products/ services etc. are environmentally friendly or misdirect criticism about the environmental and social harm of the same actions/products/services."

Awareness of how greenwashing is often used to boost a company's image has grown considerably over the past years, but monitoring greenwashing remains difficult (Financial Times, 2022).

Climate-washing is a specific type of greenwashing that focuses on false claims related to climate change resilience and adaptation activities and their impact. Like the greenwashing of mitigation gimmicks, actors can climate-wash their approach or activities related to resilience and adaptation by making false or inflated claims that it will prepare people or systems to cope with climate change impacts. This can cover up the use of funds for actors' own purposes—individual, political or economic leverage—or overstate or misrepresent the extent of resilience achieved.

Climate-washing can be used to expedite the receipt of additional adaptation funding or as a way to improve an actor's image of helping people. Climate washing may or may not be deliberate and is difficult to demonstrate; criminal or civil fraud is not often possible to prove. Still, Chan et al. (2023) make a clear link to integrity:

"Although unintentional or negligent climate-washing may not necessarily be criminally corrupt or fraudulent, it may be evidence of poor integrity, a regulatory breach or weak due diligence processes."

Greenwashing—and climate-washing—have a range of negative impacts. By promoting false solutions to the climate crisis or making false claims about their work, actors distract from and delay concrete and credible action. Greenwashing detracts attention and energy, as well as financial resources, from what is really needed and creates an illusion that appropriate adaptive action is being taken. This can have disastrous impacts on communities and ecosystems (Friends of the Earth, 2023).

3.2 Examples of climate-washing risk areas

There are a number of water and sanitation related areas where climate-washing has been flagged and is a concern. The two examples given below relate to nature-based solutions and grey infrastructure projects, but the issue is more widespread.

The ambiguity of Nature-based Solutions (NbS)

Nature-based Solutions (NbS), and ecosystem-based services, have been embraced as solution for both adaptation and mitigation. The IUCN, for example, sees NbS as addressing climate change mitigation through decreasing greenhouse gas emissions from deforestation and land use changes and the capture and storage of carbon dioxide. NbS is also undertaken to enhance resilience of ecosystems, thereby enabling societies to adapt to climate hazards such as sea-level rise, droughts, floods, heatwaves and wildfires. (IUCN, n.d.; IUCN, 2017) In 2020, the IUCN held extensive public consultations to create criteria and indicators for the IUCN Global Standard for NbS and subsequently created an assessment tool for users to improve their solution or for funding agencies and other stakeholders to assess the effectiveness of interventions. (IUCN, n.d.; IUCN, 2017).

Despite these basic definitions and standards, the concept of NbS is actually used very broadly. Global Witness (2022) reported on a large study conducted by a group of research institutes on the use of NbS, showing ambiguity in how the term NbS is used and highlighting this as a risk that can lead to greenwashing and false climate solutions:

"NbS is a broad and malleable concept. It can function as a catch-all phrase for environmental action—which, in turn, creates an opening for it to be deployed to obfuscate harmful corporate behaviour."

Another analysis for Heinrich Boell Stiftung (Kill, 2024) also highlights how vague definitions leave significant room for interpretation or co-optation and fail to clarify what kinds of projects can be considered NbS or not, and what criteria should be used to assess them. Kill (2024) further asserts that, with closer inspection, "the concept of NbS does not align with the wisdom, cosmology, traditional knowledge and sustainable livelihoods of Indigenous Peoples or peasant farming communities."

The limits of voluntary sustainability assessments

Climate-washing can also be used in relation to grey infrastructure, such as hydropower projects. Hydropower is promoted by many proponents as playing a crucial role in adaptation, with reservoirs regulating river flow, reducing peak flows and thereby reducing the risk of downstream flooding.

The Hydropower Sustainability Assessment Protocol (HSAP) is a voluntary, internal auditing tool that assesses social and environmental as well as economic and technical performance of hydropower projects at all stages, including planning, preparation, implementation and operation. It is available to partners of the International Hydropower Association (IHA), private developers, operators and manufacturers in 120 countries. The tool was adopted by the International Hydropower Association and some partners after a stakeholder engagement process (the Hydropower Sustainability Assessment Forum), including Oxfam, Transparency International, and The Nature Conservancy as CSO partners for example. However, there remain areas of non-consensus on the definition of indicators for stakeholder support in the Preparation and Implementation phases. The non-consensual views are clearly noted in the HSAP document (IHA, 2020).

CSOs have since also taken issue with the implementation of HSAP. In its guide 'Fight Back Against Greenwashing', the International Rivers Network (IRN) (2013) shows how HSAP can be used to make falsely positive claims about the impact of hydropower dams on climate. One of the concerns is that "HSAP assessors are selected from the dam industry by the IHA itself, presenting the risks of bias and conflict of interest. Meanwhile, low scores do not actually require dam builders to reform their policies or improve their performance. Indeed, dam builders are likely to assess dams that they know will receive high scores, or uncontroversial dams." (IRN, 2013)

3.3 Way forward: testing projects for false claims and climate-washing

One way to mitigate against climate-washing is by **reviewing projects to ensure that they do not make false claims**. Stakeholders should demand transparency as a basis for assessing claims and to hold organisations accountable for these claims. There are several tools that aim to uphold integrity and challenge misleading narratives in climate adaptation efforts. These can be useful starting points. For example, Friends of the Earth Europe (2023) offers a "False Promises Checklist" to identify red flags related to privatisation, technofixes, and disempowerment of local communities. Melad (2023) developed an Appraisal Tool that scores projects across their lifecycle to gauge the risk of greenwashing based on transparency and effectiveness. With regards to the HSAP, International Rivers Network provides a guide for evidence-based, participatory impact assessments.

4 INTEGRITY RISKS: MISALLOCATION, MISUSE OF FUNDS, MISMANAGEMENT

At COP29, nearly 200 countries agreed to triple the climate finance goal to USD 300 billion annually to developing countries, setting a New Collective Quantified Goal on Climate Finance (NCQG) (UN Climate Change, 2024). This is still far from enough for what is needed. To ensure climate finance is used as intended and for maximum impact, and to protect lives and livelihoods, these and other existing funds must be safeguarded from corruption, malfeasance, and broader integrity risks.

The common integrity risks related to water and sanitation funding and financing are extensively discussed in WIN's Water Integrity Global Outlook on Finance (WIGO: Finance, 2024), with recommendations of how they can be mitigated by different stakeholders. Many of these also apply to water and sanitation-related climate adaptation finance.

However, there are important differences that make integrity risks acute in climate adaptation financing. One of the most remarkable differences is, for example, the urgent need for extensive and rapid climate action across the globe, with an unpredictable future in relation to environmental changes, paired with a shaky governance landscape.

4.1 Risks along the entire project cycle

Corruption and integrity failures can occur at any stage of a project or programme. The impact of corruption in one stage can reverberate throughout a project, with far-reaching impacts. Brice Bohmer (Basel Institute on Governance, 2023) provides an example of how this can play out practically:

"Imagine a corrupt deal to build a hydroelectric plant, for instance. Government officials award an overpriced contract to a company without the right skills or experience to build the plant in return for bribes or because politicians have a beneficial interest in the company. The result? The public funds are gone. The plant is not built, or is badly built. Perhaps local residents are thrown off their land without adequate compensation or means of seeking redress. Maybe environmental assessments are not carried out or are ignored, damaging the very environment we are trying to protect."

Table 3 sets out some of the many ways that corruption and integrity failures can manifest across the various stages of a project. All of these risks have implications for the effective use of limited climate adaptation funds.

Table 3: Corruption risks in the climate adaptation project cycle (Source: WIN)

Policy Development	Capture of policy processes
Planning	Bribery, nepotism and clientelism in selection of beneficiary countries/regions and projects
	Undue interference, for example by politicians or special interest groups, in prioritisation of projects, budget allocation or investment management
	Manipulation of needs assessments and environmental impact assessments to suit certain projects or contractors

	Bias to large investments and to rent-seeking opportunities
	Deliberate overestimation or underestimation of projects costs and benefits
	Use of inadequate, manipulated, exclusive or exploitative data
Funding/Financing	Collusion and corruption in negotiation of financing
	Use of adaptation funding on non-adaptation projects
	Misappropriation/misuse of funds allocated to projects
	Embezzlement of project funds through fake or inflated invoices
	Kickbacks to officials for approving funding requests
	Manipulation of financial projections to secure funding
	Collusion with foreign financiers to access and siphon off funds
	Capture by high power partners in water or other sectors (for example energy)
Procurement	Tailoring of specifications to favour particular suppliers
	Leaking of insider information about upcoming projects to favoured bidders
	Collusion amongst bidders to manipulate the bidding process
	Bribery of procurement officials to influence contract awards
	Failure to conduct proper due diligence on bidders
	Conflicts of interest between procurement officials and bidders
	Shortcuts/bypassed procurement rules in emergencies
Implementation	Delivery of substandard materials or works that do not match specifications
	Falsification of invoices and timesheets
	Fraudulent expenditure by HR for ghost employees
	Unauthorised changes to contract terms or specifications
	Bribery of inspectors to overlook deficiencies
	Embezzlement of project funds
	Failure to complete contracted works while receiving full payment
	Nepotism or kickbacks in the selection of consultants to implement readiness support/ capacity building
	Bribery, collusion or kickbacks in the management of contracts

Monitoring and Reporting	Falsification of progress reports to hide delays or issues
	Manipulation of performance metrics to show better results
	Manipulation of financial information systems
	Bribery of auditors or inspectors to produce favourable reports
	Inaccurate self-monitoring and reporting of results
	(Purposely) Weakened oversight and accountability mechanisms
	Bypassed controls in emergencies

Corruption and integrity failures in adaptation projects can have a range of impacts, including, but not limited to:

- Waste of climate adaptation finance
- Projects implemented in inappropriate locations
- Projects that impact negatively on other communities
- Use of inappropriate solutions or technology
- Poor project implementation, including the use of substandard materials
- Non-completion of projects.

These impacts are likely to result in a project failing to meet its adaptation objectives or contributing to maladaptation.

The scope for corruption in adaptation projects with high capital costs is particularly large. This is the case for many grey infrastructure projects. Practitioners need to take action against:

"corruption risks associated with infrastructure projects such as loopholes in the procurement procedures, the effects of non-transparent privatisation processes and more. If not, well intended projects may in fact cause more harm than good by serving the interests of a narrow elite at the expense of the environment and poor communities in marginal areas who are most vulnerable to climate change." (Jacobson and Tropp 2010)

However, corruption, misuse of funds or bribery in small projects, at a local level or community level, can also have significant impacts on vulnerability of intended beneficiaries.

4.2 Integrity risk factors in water and sanitation adaptation

The risks highlighted above are not unique to water and sanitation adaptation, but they are acute in this area. The water and sanitation sectors are themselves vulnerable to corruption because of fragmentation in the sector, natural monopolies, high capital costs, and the fact that water is essential and irreplaceable to sustain life and economic activity across sectors. Challenges are compounded in adaptation by factors including added complexity and a lack of transparency.

Complexity, fragmentation, lack of transparency in financing and implementation

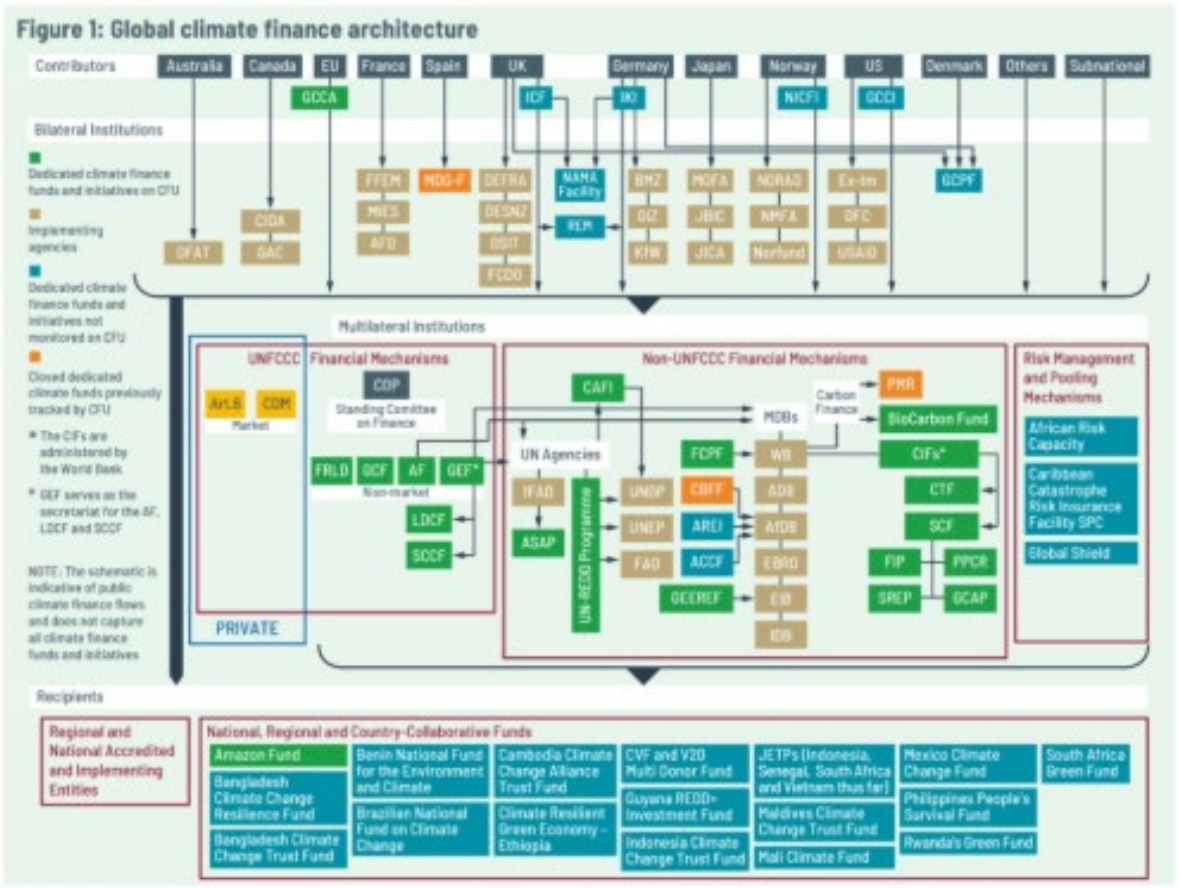
Countries historically responsible for most carbon emissions have pledged funds for adaptation in the form of grants, capital or loans. In addition, a substantial source of climate finance (particularly for mitigation) comes from or is being sought from private financing, with fewer and less standardised requirements on transparency and accountability.

Some funding continues to flow through established channels, but many new units and institutions have also been set up to manage these funds, with new processes of selecting, approving projects, and distributing funds. As Transparency International has highlighted, even across the major climate funds, the implementation of integrity mechanisms can differ substantially (Transparency International, 2022). There are also new implementation entities. As the climate architecture changes, this has continued to be a problem: the UNDP (2015) reported how the fragmentation of funding increases vulnerability to corruption. Figure 1 illustrates the complexity of financing channels.

The lack of standardised processes and reporting amongst multilateral, bilateral, and national as well as private sources make it difficult to monitor where resources are coming from, where they are going and whether they are effectively used for adaptation, who is making the decisions, who is benefiting, and what might go wrong. When definitions and standards are ambiguous, as noted above, risks of abuse are higher. This is also the case when funds are directed to projects that cover both adaptation and mitigation. Mitigation and adaptation have a natural relationship, but adaptation work can get lost in a broader and less directed use of funds under the heading of resilience.

Some organisations responsible for establishing new adaptation funding channels are making significant efforts to be transparent. Examples include the Green Climate Fund's Open Data Library and Project Portfolio sites. This is particularly important since it is the largest multilateral climate fund today, with a portfolio of USD 13.5 billion (USD 51.9 billion including co-financing) as of December 2023 (GCF, 2023). Most of these projects are cross-cutting however, making it difficult to locate and review those contributing to water and sanitation adaptation specifically.

Overall, few organisations actually provide full, updated public data on their use of climate finance—or they struggle to do so. One example is the Adaptation Fund. With contributions from up to 30 national and sub-national governments and the private sector, the Adaptation Fund has committed USD 1.25 billion for 183 projects. Its website provides data on projects that are under review as well as those being implemented (Adaptation Fund, n.d.). However, reports on progress or even final reports often lack adequate information to understand, compare or learn from experiences, successes and challenges. A case in point is the information available on the Fund's Adaptation Initiative for Climate Vulnerable Offshore Small Islands and Riverine Charland in Bangladesh, which suffered a delay in its schedule due to COVID-19. Out of almost USD 10 million (the approved project budget), less than a million has been expended since the project start in 2022. The project is supposed to be completed in 2026, but as of February 2025 there was no updated data available on the project status nor its budget expenditure on either the Adaptation Fund's website or that of the implementing organisation, UNDP.



Implementing Agencies and Institutions	
AfDB	African Development Bank
AFD	Agence Française de Développement (French development agency)
ADB	Asian Development Bank
BMZ	Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung (federal ministry of economic cooperation and development, Germany)
CIDA	Canadian International Development Agency
DESNZ	Department for Energy Security and Net Zero (UK)
DEFRA	Department for Environment, Food and Rural Affairs (UK)
DFAT	Department of Foreign Affairs and Trade (Australia)
DFC	United States International Development Finance Corporation
DSIT	Department for Science, Innovation and Technology (UK)
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
Ex-Im	Export-Import Bank of the United States
FAO	Food and Agriculture Organization of the United Nations
FCDO	Foreign, Commonwealth and Development Office (UK)
FFEM	Fonds Français pour l'Environnement Mondial (French global environment facility)
GAC	Global Affairs Canada
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (German technical cooperation)
IDB	Inter-American Development Bank
IFAD	International Fund for Agricultural Development
JBIC	Japan Bank of International Cooperation
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau (German development bank)
MTES	Mission Interministérielle de l'Effet de Serre (inter-ministerial taskforce on climate change, France)
MOFA	Ministry of Foreign Affairs (Japan)
NMFA	Norwegian Ministry of Foreign Affairs
Norfund	Norwegian Investment Fund for developing countries
NORAD	Norwegian Agency for Development Cooperation
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
WB	World Bank

Multilateral Funds and Initiatives	
AAAF	Africa Adaptation Acceleration Program
ACT	Accelerating Coal Transition program (implemented through WB, ADB, AfDB, EBRD and IDB)
AF	Adaptation Fund (GEF acts as secretariat and WB as trustee)
ACCF	Africa Climate Change Fund
AREI	African Renewable Energy Initiative
Art.6	Article 6 market and non-market approaches (implemented under the Paris Agreement)
ASAP	Adaptation for Smallholder Agriculture Programme
CAFI	Central African Forest Initiative
CBFF	Congo Basin Forest Fund (hosted by AfDB)
CDM	Clean Development Mechanism (implemented under the Kyoto Protocol)
CIF	Climate Investment Funds (implemented through WB, ADB, AfDB, EBRD and IDB)
CTF	Clean Technology Fund (implemented through WB, ADB, AfDB, EBRD and IDB)
FCPF	Forest Carbon Partnership Facility
FIP	Forest Investment Program (implemented through WB, ADB, AfDB, EBRD and IDB)
FRLD	Fund for responding to Loss and Damage
GCAP	Global Climate Action Programs (implemented through WB, ADB, AfDB, EBRD and IDB)
GCCA	Global Climate Change Alliance
GCF	Green Climate Fund
GEF	Global Environment Facility
GEEREF	Global Energy Efficiency and Renewable Energy Fund (hosted by EIB)
LDCF	Least Developed Countries Fund (hosted by the GEF)
PMR	Partnership for Market Readiness
PPCR	Pilot Program for Climate Resilience (implemented through WB, ADB, AfDB, EBRD and IDB)
SCCF	Special Climate Change Fund (hosted by the GEF)
SCF	Strategic Climate Fund (implemented through WB, ADB, AfDB, EBRD and IDB)
SREP	Scaling Up Renewable Energy Program in Low Income Countries (implemented through WB, ADB, AfDB, EBRD and IDB)
UN-REDD Programme	United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation

Bilateral Funds and Initiatives	
GCCI	Global Climate Change Initiative (US)
GCPF	Global Climate Partnership Fund (Germany, UK and Denmark)
ICF	International Climate Finance (UK)
IKI	Internationale Klimaschutzinitiative (international climate initiative, Germany)
MOD-F	MDG Achievement Fund (implemented by UNDP)
NAMA Facility	Nationally Appropriate Mitigation Action Facility (UK, Germany, Denmark and the EC)
NICFI	Norway's International Climate Forest Initiative
REM	REDD+ Early Movers (Germany and UK)

Figure 1: Global climate finance architecture (Watson et al, 2025:4)

Complex implementing arrangements can give rise to challenges in accountability: it is often unclear where responsibility for managing funds effectively lies, since they are sometimes handled and delivered by a multiplicity of actors (development banks, UN agencies, companies, local government authorities, government ministries, CSOs and NGOs) through complex or unclear chains of accountability and with different governance standards.(Good, 2017)

More, climate adaptation rarely fits neatly inside a single policy or sectoral lane. Interdependencies—like how flood-protection choices affect power-grid design or crop irrigation—create knock-on effects that can further increase complexity, requiring constant recalibration across institutions and stakeholder groups. As the number of involved sectors multiplies, so does the need for coordination, making integrity and accountability as crucial as the technical solutions themselves.

Weakened public finance management in implementing entities, especially in emergencies

Much of climate finance is channelled to national governments; their financial management plays a key role. Most of the main country recipients of climate finance already have very high levels of corruption (Nest et al., 2020). Further, countries with weak public financial management may be the same as those most in need of adaptation, placing populations in triple jeopardy. This includes 1) existing vulnerability from a lack of services, 2) additional burdens due to climate impacts and 3) a lack of effective government use of climate finance due to dysfunctional public financial management and the corruption that can be present.

These weaknesses are exacerbated in the face of climate related emergency situations, such as floods and severe storms. Experiences with integrity failures that arise in disaster relief have made stakeholders more conscious of how time pressures can lead to compromising or bypassing controls and leaving spaces for corruption (WIN, 2024). This has been a focus of GCF discussions/webinars about recipient organisations being vetted onto a list of approved contractors.

Shrinking civic space and targeting of environmental rights defenders

Several reports have recently noted a trend towards shrinking civic space, affecting environmental organisations and action in particular (WIN, 2024; CIVICUS, 2024). Shrinking civic space—manifested in restrictive laws, bureaucratic hurdles, surveillance, and intimidation—limits the watchdog role of civil society across every stage of climate action, turning transparency gaps into integrity and corruption fault-lines.

Meaningful participation by civil society can be sidelined in the shaping and overseeing of climate policy, making it more challenging to contest skewed consultations or to expose conflicts of interest. In climate finance, curtailed oversight can heighten the risk that money does not flow where it is intended, in part because whistleblowers face retaliation and independent media lack access to information. Finally, at the implementation stage, the criminalisation or physical intimidation of defenders can deter communities from flagging issues, enabling officials and contractors to cut corners or demand bribes with impunity. Thus, the systematic targeting of those who champion environmental and indigenous rights is more than a human-rights issue; it is a structural governance risk that can undermine the legitimacy, equity, and effectiveness of climate adaptation work.

4.3 Way forward: no reason, no room, no reprieve

There is still too little analysis and understanding of the risks that contribute to integrity failures and in some cases maladaptation. This in part because the institutional forms and flow of funds have developed slowly and are not yet well established, and because so little has been directed to water and sanitation adaptation.

Another significant challenge is the lack of data, both on the range of climate sources, on the status of projects and on potential governance issues and/or integrity failures. WIN conducted a preliminary review of water and sanitation adaptation climate finance in its three focus countries: Mexico, Bangladesh and Kenya in 2024. In addition to struggling to obtain data from the range of climate finance sources, case studies of integrity failure were few and far between and rarely focused on water and sanitation. This is a common challenge for studies on corruption and integrity failures. In water and sanitation adaptation, it is critical. Within a range of networks focusing on water and sanitation related adaptation, a community of practice that is committed to exploring the reasons for integrity failures would be beneficial.

Despite the specificities of water and sanitation adaptation, there are many known strategies for action to mitigate risks across the project cycle. In addition to calling for better integrity risk assessments by sector stakeholders, WIGO: Finance (WIN, 2024) proposes three broad pathways—the *Three Rs*—to develop effective integrity and anti-corruption programmes in water and sanitation. These are equally useful starting points for water and sanitation adaptation:

- The **No Reprieve** pathway emphasises **detection of malpractice and the application of sanctions** (it can include for example – using big data to better identify red flags, protecting whistleblowers or punishing abuse).
- The **No Room** pathway: relies on structural, legislative, regulatory or managerial interventions to **narrow the opportunities available to corrupt actors** (it can include for example – clarifying rules and responsibilities, establishing standard operating procedures that limit discretion, or enacting open contracting).
- The **No Reason** pathway undermines the accepted ubiquity of corrupt practices and disrupts the ways in which pressure and rationalisation drive integrity failures. It is about **building a culture of integrity and collaboration, and setting clear expectations for integrity** (it can include for example – addressing social norms, training and awareness raising, and rewarding integrity).

Along these paths, there are two priorities. Now is the time to institute clear anti-corruption controls and processes so that they become institutionalised, common practice in water and sanitation adaptation. This can include carrying out corruption risk assessments and tailoring anti-corruption measures to the country circumstances, supporting anti-corruption bodies, and developing independent recourse and complaints mechanisms (UNDP, 2015). More regulatory action on corruption in climate solutions and more action by anti-corruption institutions to crack down on climate-related risks (Chan et al., 2023) are also needed.

In addition, strengthening and safeguarding civil society is foundational to operationalising the three Rs. When watchdog groups, community networks, intended beneficiaries and investigative media can freely participate, they not only deter corrupt actors from operating, but help to keep integrity controls and a culture of integrity and collaboration alive. Embedding civil society at every level—while climate finance is still scaling—will normalise an integrity approach in climate action, inoculating the system against opaque or more sinister practices that might otherwise take hold.

Some interesting examples include, at a global level, Transparency International maintaining the Climate and Corruption Case Atlas. In Kenya, WIN's partner CESPAD is working alongside county officials in Makueni to monitor the flow of water and sanitation adaptation funding to local areas. Allocations have been made to national government, which then distributed funds to the county government, but there are obstacles to the accurate implementation and traceability of these funds. Although early in the process, the approach seems promising.

5 INTEGRITY RISKS: NON-ADHERENCE TO ADAPTATION PRINCIPLES

The third type of integrity risk derives from the failure to adhere to well-established principles in the planning and implementation of adaptation projects. Given the relationships between resilience, adaptation, development, and water and sanitation noted in section one, these principles cannot be ignored. Not adhering to these principles undermines the effectiveness of projects and can result in maladaptation. Such malpractice is not necessarily corrupt, though it can be. It relates to broader and more delicate integrity risks, mismanagement or negligence. It is linked to questions of professionalism, the honest execution of responsibilities, and commitments to equity, the public interest, and leaving no one behind.

WIN identified the following interrelated principles for adaptation (and related risks) based on extensive frameworks described in reports and academic articles on (mal)adaptation (Magnan, 2014; Schipper, 2020; Jones et al., 2015; Eriksen et al., 2021).

5.1 Understanding principles for adaptation and related risks

Collaboration

The first principle is collaboration. It is about:

- collaborating **across sectors and levels of government** and with a range of stakeholders
- collaborating closely **with affected communities** to understand and extend local adaptation initiatives, and
- **building on local knowledge** and existing coping mechanisms.

This goes beyond participation. Insufficient collaboration and involvement can contribute to maladaptation.

Communication and coordination between different stakeholders are essential because climate challenges require synchronisation across multiple sectors and actors, especially for water and sanitation. Project strategies must work in conjunction with the existing strategies of other organisations or groups' projects that are underway. Coordination measures optimise resources and maximise efficiency when tackling climate change impacts.

Adaptation efforts are more effective and sustainable through integration and development of local skills and knowledge. In addition, empowering the local community builds ownership and capacity to sustain adaptation projects in the long run. In other words, leveraging existing community skills, capacity and knowledge of local communities will enhance the reach and sustainability of adaptation projects. (Makondo and Thomas, 2018)

Adaptation as a political process

The second principle is about recognising adaptation as an "inescapably political process" (Boutroue et al, 2022). The IPCC's AR6 risk framing stresses that climate risk is inseparable from "values, interests and decision processes" — in other words, who governs and how they are held to account matter as much as the temperature pathway itself (New et. Al., 2022). This means adaptation work must take into account:

- **interconnectedness** of systems,
- **trade-offs** between different options,
- management of **conflicts and power differentials**,
- the **recognition of local skills, knowledge and values**, and
- **different understandings of risk**.

This has implications for decision-making, planning and implementation, particularly for water and sanitation, given that adaptation objectives often overlap with other related sectors such as agriculture, forestry, energy, and ecosystem services. Experience shows that weak oversight, opaque data, and misaligned incentives can distort scenario analyses, undermine credibility, and channel adaptation finance toward low-priority or even maladaptive projects.

Governance arrangements must be able to "produce legitimate compromises between multiple policy domains and actors; to enhance higher level conflict management when necessary; and to ensure regular policy evaluation with an effective bearing on subsequent policy decisions" (Boutroue et al, 2022:892). In many cases this relates to using innovative multi-stakeholder processes that explicitly seek to create a more equal power balance in the meeting space.

Behaviour-based strategies rather than just infrastructure-based initiatives must also be considered. Adaptation strategies may include technological and infrastructure projects but also require the empowerment and inclusion of local communities and continuous efforts to openly assess and address interests, trade-offs, conflict, and integrity risks. It is important to identify, articulate and engage with the issue of who benefits from (and who is impacted by) projects in the short term, and how this can change over time—and to make that transparent. The interconnectedness of ecosystems, socioeconomic systems, and communities must be considered to avoid displacing vulnerabilities onto other environments (neighbouring areas connected ecologically or socio-economically). And in this regard, local skills, knowledge, social characteristics and values must be recognised and taken into account in line with the principles of climate justice.

Flexibility

The third principle is flexibility. It relates to:

- **planning for uncertainty** throughout a project
- adopting reversible or **no/low regret options** and
- building in **safety margins**.

It requires that measures are taken to allow for regular reviews and adjustments of plans during implementation, in response to evolving conditions. Uncertainties covering climate change impacts and human and ecosystem reactions must be integrated into projects.

Various options can be used to plan for uncertainty, such as investigating diverse responses, to ensure that if one approach fails or is ineffective, alternative measures have already been considered and planned for, and adopted low or no-regret options. An alternative is to plan for solutions that work under a range of different climate impact scenarios.

5.2 Examples

The following two examples highlight some of the intertwined dynamics that relate to the adaptation principles proposed above and the risk of maladaptation.

Anhchanh Roung, Cambodia (Work et al, 2019)

This project aimed to rehabilitate the deteriorating Lum Hach irrigation infrastructure, funded by the Japan International Cooperation Agency (JICA). Given the change in rainfall, it sought to improve the region's agricultural productivity and contribute to its socio-economic development through reliable water provision for irrigation. The project was a reaction to the change in precipitation and water shortages that villagers suffered, but the social impact of these solutions was not considered by stakeholders in their planning.

Community members were initially not involved, and the project was not implemented transparently. Villagers discovered that the project would significantly expand the canals, yet they had not been consulted or informed. This created a new vulnerability as the canal expansion meant that land would be taken away from villagers without any reparation or regard for what this meant for their livelihoods.

Villagers at first received no response when they individually communicated their concerns to local authorities about land distribution favouritism, water use inequalities, and uncertainty about compensation for those affected by the expansion of the canals. Working with civil society organisations and academics, they then pressured stakeholders (including JICA, Cambodia's Ministry of Water Resources, and the Ministry of Economy and Finance) for project details and a social impact assessment. They invoked Japan Bank for International Cooperation guidelines on transparent processes, which JICA complies with. Finally, authorities promised fair compensation for the villagers affected by the expansion of the canals.

Large-scale infrastructure development in Ho Chi Minh City, Vietnam

In Ho Chi Minh City (HCMC), based on the best predictions at the time, city officials developed and implemented infrastructure projects (sewage, drainage, dikes and barriers) to mitigate expected flood risk from sea level rise (Hallegatte et al., 2012). However, it has become increasingly clear that this may not have been the best technical option, since storm sewerage may not have the capacity to cope with higher-than-expected flood waters, and dikes and barriers may not be able to contain rising tides.

There is now discussion on supplementing (or possibly replacing) this kind of large-scale infrastructure for adaptation projects with smaller projects based on more participatory governance approaches and attending to the impact on poor people specifically (Schreiber et al, 2023). A more flexible, low-regret paradigm may be the way to go both in terms of strategic planning for the future, using a number of adaptation pathways (IPCC, 2012; Marchau et al., 2019 in Scheiber et al., 2023)

5.3 Way forward: a culture of integrity, strengthening civil society and public capacity

There are a few factors that could facilitate the application of these adaptation principles. Strengthening civil society and building capacity for collaboration as well as for political and integrity analysis can be groundwork, but there are many opportunities for innovation that should be explored further.

Scaling up coordination and collaboration for climate adaptation means moving from a handful of well-intentioned one-off projects to a system in which line ministries, regulators, utilities, finance agencies, municipalities and local communities plan and act together as a matter of routine. OECD reviews of adaptation and water governance emphasise that success hinges on three things: clear multi-level mandates, permanent cross-sector co-ordination bodies, and strong mechanisms for sharing data and finance across administrative boundaries. Where those ingredients are missing, governments face the familiar "six co-ordination gaps" — information, capacity, policy, funding, accountability and objective gaps — that stall implementation and deplete resources (OECD 2011; OECD 2024).

Better collaboration also requires integrating climate adaptation directly into regular development planning and budgeting cycles and anchoring it in clear, cross-sector institutional arrangements. At sub-national scale, basin-wide or metropolitan resilience platforms translate these directives into integrated programmes that pool the expertise and budgets of water, transport, housing, energy and agriculture agencies while giving civil-society a formal seat at the table. Dedicated funding windows that only accept joint, cross-sector proposals, together with shared GIS data portals and participatory tools (e.g., social audits, citizen juries), can ensure that every stakeholder works from the same risk information set and that community knowledge informs decisions throughout the project cycle (European Commission, 2021).

Example - The SADC WEF Nexus Framework (Kabeya, P. K., et al. 2022)

Water, energy, and food security are key priority areas for the Southern African Development Community (SADC). To facilitate integrated planning, SADC has adopted the WEF Nexus conceptual understanding through a multi-stakeholder dialogue process under the SADC-EU project "Fostering water, energy and food security nexus dialogue and multi-sector investment in the SADC Region". The project seeks to institutionalise the WEF Nexus approach at regional and national governance structures and support investment decisions for water, energy and food security in the region.

As part of the project, the SADC Secretariat has been setting up a regional WEF Nexus framework for the coordination of institutions, policies, strategies, programmes, and projects to achieve WEF security and ensure natural resource efficiency. The framework provides guidelines for coordination at the following different levels:

- Policy and decision-making level: Coordination for the three sectors in developing and reviewing policies, plans and strategies is through a Joint WEF Ministers' Committee in the SADC Governance Structure.
- Regional technical level: Joint development and implementation are through a Joint WEF Technical Committee with support from the SADC WEF Working Group, anchored at the SADC Secretariat.
- Units responsible for the WEF Sectors within SADC: These Units are integrated in the SADC WEF Working Group to improve coordination.

- Regional implementing entities and other partners: Programmes and activities by SADC's subsidiary entities and other partners are coordinated through the SADC WEF Working Group. The Secretariat also provides guidance and technical support.
- Multi-stakeholder platforms: A SADC regional WEF nexus Multi-Stakeholder Forum is meant to provide a wider forum with balanced representation of the three sectors.

Embedding integrity mechanisms at every junction of coordination—e.g., mandatory publication of inter-ministerial minutes, public-facing dashboards on adaptation spending and independent audit mandates—would let stakeholders trace decisions and budgets as policies are decided and implemented, sharpening both horizontal (across ministries) and vertical (national-local) accountability.

Finally, applying the principles requires treating governance quality as a key uncertainty driver alongside climate trajectories; stress-testing policies for potential future fraud or regulatory capture, disclosing decision-making trails that have been aligned with relevant risk assessments, or adopting monitoring systems for climate projects that take into account shifting governance trends.

6 RECOMMENDATIONS, OPEN QUESTIONS, AND NEXT STEPS

Adaptation projects and programmes in the area of water and sanitation are critical to protect the most vulnerable against the rampages of climate change. It is not surprising that many programmes fail to have the desired impact or, in fact, have negative impacts. This is evident in maladaptation's four impacts on vulnerability—exacerbating it, creating new vulnerabilities, displacing it or worsening future vulnerability.

This paper has established a conceptual framework to consider water and sanitation adaptation and opened up discussion of its particular integrity risks. These risks can and must be addressed to prevent maladaptation. To do so requires strengthening integrity at all levels, a process which can be practically operationalised by adhering to the integrity principles of Transparency, Accountability, Participation, and Anti-Corruption, as well as related good practices for development and adaptation.

Transparency

- Clear, transparent information is critical for water and sanitation adaptation but is a weakness of the sector, contributing to all risks above. Better information is especially needed on:
- Potential impacts of projects on ecosystems, socioeconomic systems, communities, and their interconnectedness
- Aims and expectations of involved stakeholders, especially in cross-sector initiatives
- Climate finance sources and the conditions and impact of loans and other funding mechanisms
- Budget and expenditure of climate finance, as well as project advancement
- Documentation of integrity failures and corruption cases

Information also needs to be publicly available through open channels of communication that are accessible to and easily understandable by stakeholders, particularly marginalised communities. Transparency should enable feedback from stakeholders and improve accountability.

Accountability

Transparency is important as long as information can be acted on and used to hold actors with entrusted power to account. Strengthening accountability implies:

- Clear roles and responsibilities
- Means to share feedback and grievances and have these addressed
- Clear and effective monitoring, evaluation, and reporting frameworks
- Adequate space and priority given to stakeholders (especially civil society and the media) that have the capacity to review information and hold decision-makers to account

In this regard, welcoming and strengthening the role of civil society is a critical accountability measure.

A range of accountability mechanisms have been developed over the last decades, which can be deployed in the context of water and sanitation adaptation, at each stage of the project cycle. These include participatory climate budgeting, climate planning and social audits. More straightforward accountability can be sought through dialogues and focused meetings called by residents or civil society organisations to set out issues and seek resolution.

Participation

Participation is possible on a spectrum from tokenistic to empowering, as illustrated by Arnstein's participation ladder (1969). Using the highest level ('rung') of participation that is appropriate for the project can strengthen the effectiveness of planning, implementation and monitoring, as well as reduce conflicts of interest and project bias. Such participation can ensure that projects do not meet just the interests of specific groups (UNDP, 2015) and also do not undermine the needs of other groups, particularly the less powerful. Empowered participation that leverages community skills, capacity, and knowledge also enhances acceptance, reach and sustainability of adaptation projects (Makondo and Thomas, 2018).

Free, prior and informed consent is derived from the right to self-determination and thereby protected under international law. It is violated when a community is not adequately consulted (or only one part of a community is consulted) or when comprehensive information is not provided. For example, a community's rights would be violated when they were not adequately consulted or involved on granting planning permission in the construction of a hydroelectric dam. (Chan et al., 2023). When related to the "dishonest abuse of legitimate processes by actors when implementing climate solutions" (Chan et al., 2023:23), sometimes to allocate funding for personal interests and relationship over expected achievement of climate adaptation goals.

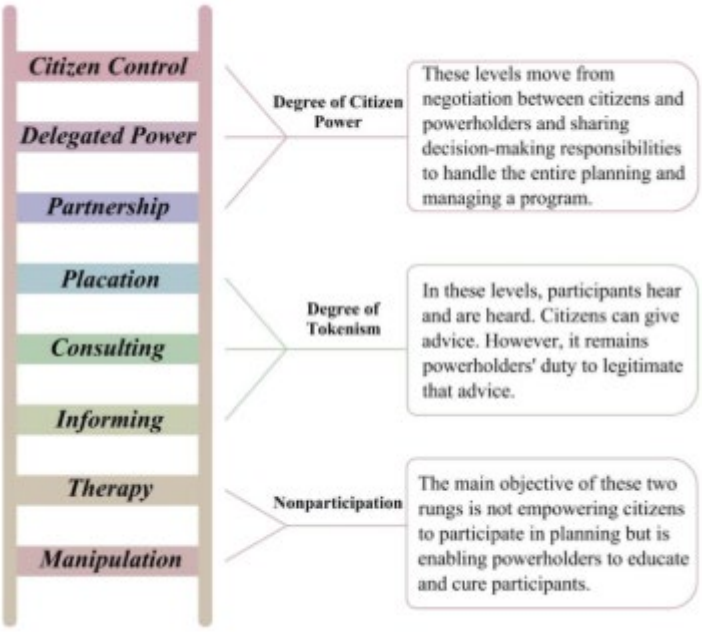


Figure 2: Ladder of Participation (Arnstein, 1969)

Several of the cases presented in the maladaptation section above made especially clear the need for better participation. To avoid maladaptation, participation requires:

- Going beyond invitations to consultations to ensure empowered participation from planning to implementation. This means recognising communities as active agents in adaptation processes. It might require going towards (rather than bringing in) a group and engaging in their own space or 'invented space' (Miraftab, 2004). It might also require capacity building on formal aspects of adaptation and implementation.
- Obtaining perspectives and positions of different actors, particularly affected groups and traditionally marginalised groups.
- Paying attention to dynamics that hinder participation (especially of women or marginalised group members), including language, how a meeting is chaired, how the agenda is set, how time is allocated or left for different groups. (Gaventa, 1982), and childcare or other responsibilities.
- Integrating local knowledge and inputs on social characteristics and cultural values about risk and environmental dynamics.

Meaningful participation of all stakeholders is also key in governance arrangements or decision-making bodies. Such governance arrangement must be able to "produce legitimate compromises between multiple policy domains and actors; to enhance higher level conflict management when necessary; and to ensure regular policy evaluation with an effective bearing on subsequent policy decisions" (Boutroue et al, 2022:892).

Anti-corruption

Anti-corruption measures are a crucial building block for integrity. Any effective anti-corruption and integrity initiative benefits from a recognition of corruption risks and a proactive, multi-stakeholder corruption risk assessment for specific projects and sectors.

Based on the cases above and the breadth of corruption risks that are likely across the project cycle, further priority measures could include:

- Creating channels for surfacing, detecting, recording, and managing conflicts of interest or instances of undue interference or indue influence.
- Maintaining strict lobby registers.
- Building systems for reporting and seeking redress for corrupt practices (e.g. whistleblowing) and ensuring the protection of whistleblowers.
- Enhancing audits, investigations and sanctions for climate adaptation related corruption, including through engagement with anti-corruption and law enforcement agencies.

+ Principles for (water and sanitation) adaptation

Adopting global principles in adaptation planning and implementation is a further component of integrity, which can support effective adaptation. This includes:

- Collaborating, across sectors and especially with communities: to build on local knowledge and local coping mechanisms, and to contextualise interventions.
- Acknowledging the political and social dimensions of adaptation work: bringing to the fore the trade-offs, conflicts and addressing them in truly participatory governance frameworks, while focusing also on behaviour-based strategies (not just technology).
- Planning for flexibility and uncertainty.

These TAPA+ principles can be used to inform and develop practically oriented climate adaptation guidelines for different implementation entities, noting the need to adjust for context specificities (Magnan et al, 2016).

To make this possible**, further research is needed to outline the flow of climate finance and the requirements attached to different sources**, not only as a means of understanding integrity safeguards in place, but also to understand how integrity risks in climate finance can increase the risk of maladaptation. This may entail the level and type of stakeholder able to receive funds, the focus of funding and the scope to embed the flexibility to make changes to avoid maladaptation, the scope for local participation and accountability, or the transparency of funding and of the process.

As a working paper, the **principal objective of this publication is to present rarely explored but critical elements of the intersection between integrity and water and sanitation climate adaptation, to incite discussion across the sector**. An expansion of some of the ideas presented in this paper will form the basis of WIN's next Water Integrity Global Outlook (WIGO), which will be focused on climate change. **WIN warmly welcomes feedback** on this paper, as well as any further input or contributions that may support the development of the upcoming WIGO, via the following link:

https://www.waterintegritynetwork.net/wigo-climate-adaptation

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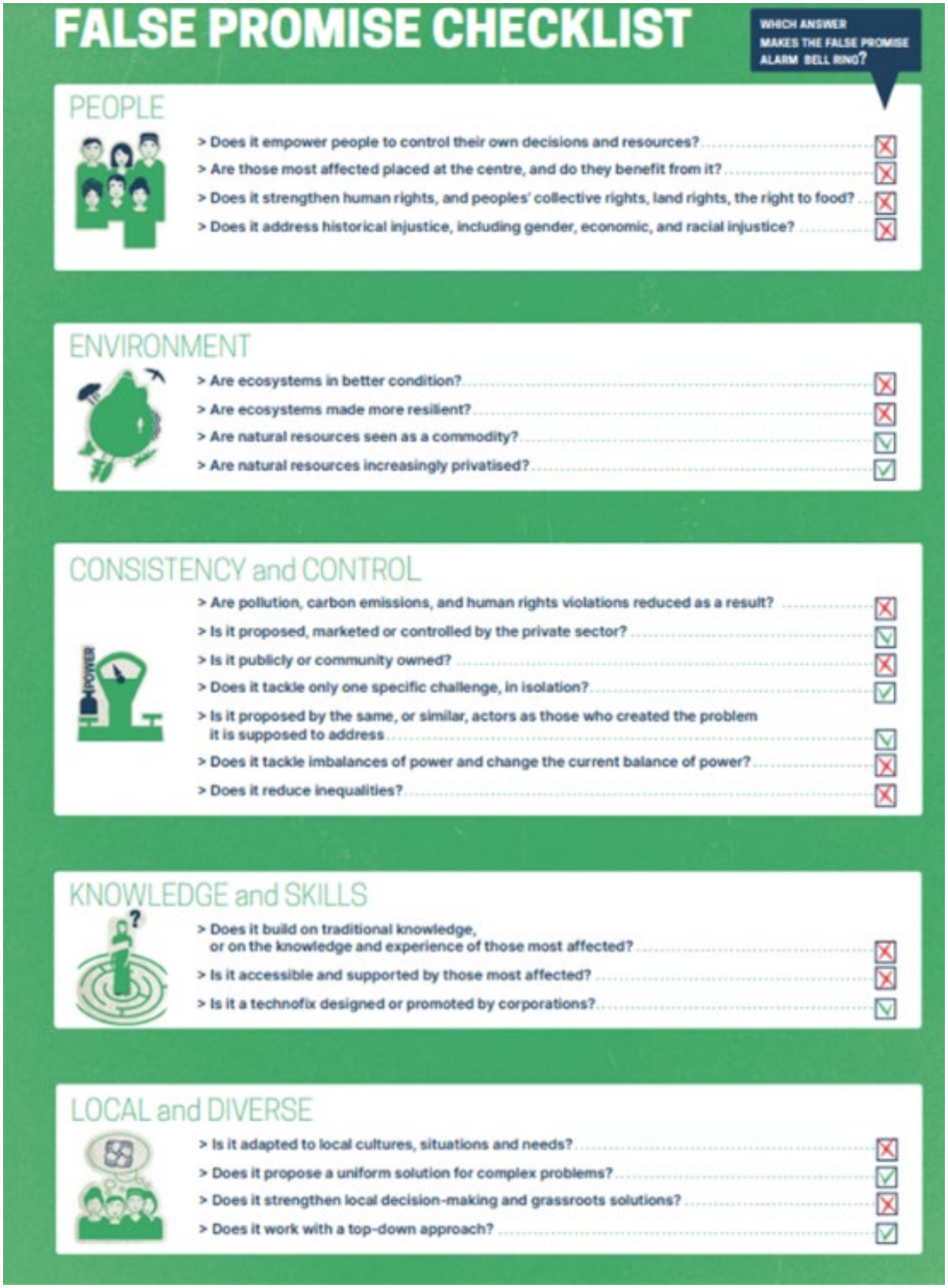
APPENDIX: TOOLS TO EVALUATE GREENWASHING

Checklist developed by Friends of the Earth

This simple checklist can be applied to any project under consideration to identify where it may be prone to greenwashing



Appraisal tool to identify and assess greenwashing in specific projects

This diagnostic tool, developed by a post graduate student from IHE Delft through application to Bangladesh, can be used to assess different types of climate and water projects in country and the risk of greenwashing. It provides useful indicators and can be developed more extensively. For example, equity elements or who benefits.

Developed by Melad (2023), the tables below set out components of a credible programme and project, and then a means of appraising them. With the use of the Appraisal Tool with categorical questions, the raw score determines the degree of greenwashing in a climate adaptation infrastructure programme or project.

Eight Components of a Credible Program and Project

Project Management Cycle	Component	Definition
Pre-implementation phase	Projected Benefits	• Claims should avoid climate-related short- and long-term damages. • Claims should have value-added elements, which may include amenities, climate mitigation, environmental benefits, and health impacts.
	Efficiency	• Claims should translate more benefits over the identified costs (e.g., policy development administrative cost, technical adaptation measures cost, scientific projections and cost of modelling, and opportunity cost to the society from application of adaptation measures).
	Feasibility	• Claims should be interpreted in relation to acceptability in various perspectives. • Claims should comply with actions, externalities, incentives, investments, legislation, and regulatory frameworks that are prerequisite to implementation.
	Robustness	• Claims should reflect the range of uncertainty if climate and socioeconomic scenarios change with incorporated safety margins and low regrets.
Implementation phase	Effectiveness	• Claims should be able to work and deliver results for the stakeholders.
	Flexibility	• Claims should easily allow adjustments and incremental implementation if climate and non-climate conditions change. • Claims should be able to be adapted, revised, or made undone with barriers that can be undone at low costs.
Post implementation	Sustainability	• Claims should avoid maladaptation, and bring no-regret benefits in alleviating pre-existing problems. • Claims should avoid: (a) affecting other agents (e.g., communities, vulnerable populations); and (b) causing or exacerbating pressures on sectors in terms of the program/project's adaptive capacity.
Crosscutting	Transparent Communication	• Claims should use language and statements that are easy to understand, verifiable, and from generally recognized evidence to measure or track the progress in achieving targets.

Climate Adaptation Appraisal Tool Questions

Project Management Cycle	Component	Appraisal Question
Pre-implementation phase	Projected Benefits	1. Does the program/project avoid climate change damages? 2. Does the program/project has identified value-adding elements, which may include amenities, climate mitigation, environmental benefits, and health impacts?
	Efficiency	3. Does the program/project translate more benefits over the identified costs?
	Feasibility	4. Is the program/project acceptable in various perspectives? 5. Does the program/project comply with actions, externalities, incentives, investments, legislation, and regulatory frameworks that are pre-requisite to implementation?
	Robustness	6. Does the program/project reflect the range of uncertainty if climate and socioeconomic scenarios change with incorporated safety margins and low regrets?
Implementation phase	Effectiveness	7. Does the program/project should work and deliver results for the stakeholders?
	Flexibility	8. Does the program/project easily allow adjustments and incremental implementation if climate and non-climate conditions change? 9. Can the program/project be adapted, revised, or barriers can be undone at low costs?
Post implementation	Sustainability	10. Does the program/project avoid maladaptation, and bring no-regret benefits in alleviating pre-existing problems? 11. Does the program/project avoid: (a) affecting other agents (e.g., communities, vulnerable populations); and (b) causing or exacerbating pressures on sectors in terms of its adaptive capacity?
	Transparent Communication	12. Does the program/project contain language and statements that are easy to understand, verifiable, and from generally recognized evidence to measure or track the progress in achieving targets?