Urban, Resilience, Disaster Risk Management, and Land

Sector Note on Applying the World Bank Group Paris Alignment Assessment Methods

This Sector Note outlines sector-specific issues for applying the World Bank Group (WBG) Paris Alignment (PA) assessment methods to operations with Urban, Resilience, Disaster Risk Management (DRM), and Land-related (URL) sector activities. The Note is not a stand-alone document and should instead be used in conjunction with the applicable WBG PA assessment methods[1] and other relevant Sector Notes for demonstrating alignment. The Note will be updated from time to time to capture the lessons learned; incorporate progress, breakthroughs, and developments in technologies, policies, practices, and consumer behavior; and reflect the evolving pipeline of the WBG URL-related operations. The most relevant activity types for the WBG URL-related operations covered by other Sector Notes are, but not limited to: (i) Rural and Interurban roads, and Urban Transport covered by the Transport Note; and (ii) Water supply and Sanitation covered by the Water Note.

Promoting low carbon urban growth and sustainable land use patterns, ensuring climate-resilient urban development, and preparing for and building back from disasters in a climate-informed manner are critical contributions to meeting the goals of the Paris Agreement. Since urban form and infrastructure are typically long-lived and land use change is difficult to reverse, it is important to ensure that urban, disaster risk management (DRM), and land interventions supported by WBG operations are designed to avoid hindering a country's low-carbon and climate-resilient transition considering the local context and conditions.

1. Investment operations: Main considerations in assessing Paris Alignment of URL sector operations

Mitigation

A growing urban footprint, energy use in building and transportation, and waste are key drivers of greenhouse gas (GHG) emissions in urban areas. With the global urban population expected to increase significantly by 2050, particularly in low and lower-middle income countries, the GHG emissions associated with an expanding urban form, provision of urban services, improving connectivity, construction of new infrastructure and building stock, and energy supply to urban inhabitants and economic activities will continue to grow. While this GHG emissions increase is associated with these countries advancing on their Sustainable Development Goals (SDGs), it is critical to ensure that urbanization doesn't lead to long-term carbon lock-in. It is also equally important to consider opportunities for low-GHG emission urban development in middle-income countries where the urban form is more mature. In addition, increasing urbanization in areas exposed to climate hazards requires resilience measures undertaken in a low carbon manner to reduce the severity of damage and losses and safeguard development gains. Decarbonization pathways for urban areas focus on the buildings, transport, and waste sectors. Climate-informed urban form and spatial growth patterns, modal shift towards low-carbon transport modes, and the provision of basic services leading to a circular economy and energy-efficient buildings are the main vectors of low-GHG emission development in the WBG URL-related operations. In the Land sector, land use conversion from forested to non-forested uses that reduces carbon sinks from loss of tree cover or forests is the key GHG emissions driver. Preventing the depletion of carbon sinks by avoiding deforestation or promoting afforestation is crucial for reducing GHG emissions in this sector.

[1] WBG PA assessment methods are conceptually consistent with the joint MDB Paris Alignment Approach (MDB PA Approach) and consist of the following: (a) For the **World Bank**, the World Bank Paris Alignment (PA) Methods (WB PA Methods) are applicable to operations under three financing instruments—(i) Investment Project Financing (IPF), including operations using Financial Intermediaries, (ii) Programs for Results (PforR), and (iii) Development Policy Financing (DPF). (b) For **IFC** and **MIGA**, the assessments apply the MDB PA Approach to operations under Direct Investment Operations, Financial Intermediaries, and Corporate General Purpose (CGP) Financing. The MDB PA Approach for CGP Financing applies only to IFC and MIGA.

The PA assessment includes assessing that the activity being financed is consistent with (does not hinder) the country's Nationally Determined Contribution (NDC), Long-Term Strategy (LTS), or other climate-related strategies and policies, taking into account WBG's own climate analysis such as Climate Country Development Reports (CCDRs) and checking if the activity is universally aligned or non-aligned according to the respective lists. For operations with activities that are not on either lists, the mitigation assessment approach laid out in the WBG PA assessment methods will be followed to assess the operation's alignment with the Paris Agreement's mitigation goals to determine the risk of an operation having a negative impact on the country's low-GHG emissions development pathways, and modify the activity design as needed[2] Risk assessments take into account the country and project/program development context, including that low- and middle-income countries (LMICs) have essential development needs to be addressed, typically have low GHG emission trajectories, and have historically contributed little to global GHG emissions. As such, the risk assessment should consider the specific country and project/program development context, including economic, institutional, and technical feasibility and market considerations, as well as the specific private sector considerations. The risk assessment of projects includes consideration of feasible lower-GHG emissions alternatives,[3] carbon lock-in risk, and transition risk. The appropriate risk assessment approach and risk mitigation measures will depend on both the nature of the WBG operation and the level of the broader WBG country engagement with the private or public counterparts (e.g., in applying system-wide or asset-level assessment).

Municipal Solid Waste Management (MSWM)

The focus of the assessment is on waste disposal practices, inclusion of systems to reduce methane (CH_4) emissions from landfills, and the feasibility of waste reduction and reuse approaches such as recycling, composting, and energy recovery. MSWM activities that increase circularity through waste reuse or recycling; reduce CH_4 emissions from decomposing waste; or facilitate energy recovery such as separate waste collection, composting and anaerobic digestion of biowaste, material recovery, and closed landfills with landfill gas recovery are universally aligned. In addition to these, activities such as waste collection, waste transportation, and waste transfer centers are likely to have a low risk on mitigation and therefore are also considered aligned on mitigation, if they are components of an integrated solid waste management (ISWM) system.[4] On the other hand, collection and transport of mixed waste in non-ISWM systems, new landfills, and closed landfills without landfill gas capture systems would require further assessment and would need to consider adjusting their design if feasible lower-carbon alternatives exist under the technical conditions of the operations and in the sector-specific context (e.g., given waste collection coverage and frequency; emissions performance and fuel consumption of the vehicle fleet; relative shares of waste recovery and disposal; volume, age, and composition of waste being collected and disposed; size and design of landfills, etc.). The carbon lock-in and transition risk for MSWM activities that are applying such lower-carbon options is expected to be low since they primarily improve waste management, reducing CH_4 emissions from decomposing waste.

Buildings

The focus of the assessment is on the "operational carbon" based on the drivers of energy demand and the different energy sources used in buildings. New, reconstructed, or retrofitted buildings that: (i) achieve at least Level 1 EDGE Certification or other global certification with equivalent energy performance

[2] For World Bank investment operations, the question of the economic viability after accounting for transition risks, is not applicable for Technical Assistance components.

[3] The assessment should focus on feasible lower-GHG emissions alternatives. "Feasible" means "commercially available, technically and financially viable" for IFC and MIGA and "technically feasible and economically viable" for the World Bank.

[4] ISWM is a comprehensive approach to MSWM that comprises waste collection, segregation and transfer, recycling and recovery, and treatment and disposal in an integrated manner and contributes to GHG emissions reduction from solid waste.

requirements; OR (ii) are compliant with national or local building codes that have energy performance standards equivalent to the Level 1 EDGE Certification; OR (iii) improve energy performance equivalent to or beyond the Level 1 EDGE Certification are universally aligned. Additionally, fully electrified energy-efficient buildings that meet their energy demand entirely by renewables are likely to have a low risk on mitigation and therefore are also considered aligned on mitigation. All other buildings would require further assessment based on the type of energy used in major drivers of energy consumption such as space conditioning, water heating, and energy-intensive equipment and appliances in non-residential buildings. Additionally, since buildings are long-lived assets, they have a high carbon lock-in risk and may also be at risk from the low-carbon transition associated with increasing regulation and declining market attractiveness.

Disaster Risk Management (DRM)

The assessment focuses on (i) energy use in activities, (ii) the lifetime of activities, (iii) availability of plausible lower-carbon options for critical activities, and (iv) increase in physical footprint or capacity and lifetime of the rehabilitated or reconstructed infrastructure compared to the pre-disaster or emergency scenario.[5] DRM activities undertaken to improve disaster preparedness and facilitate risk reduction by supporting conservation of natural habitats and ecosystems, flood management and protection, coastal protection, and urban drainage are universally aligned provided they meet relevant conditions. In addition to these, disaster risk reduction (i.e., adaptation), immediate emergency response and recovery activities that are (i) temporary and timebound and intended to provide relief in the aftermath of a disaster (e.g., emergency operations centers, debris clearance, temporary shelters, etc.); or (ii) undertaken to enable countries to prepare for, respond to, and recover from natural disaster events (climate risk platforms, hydromet monitoring and forecasting systems, early warning systems) are also considered aligned on mitigation. Such activities should not expand or promote expansion into areas of high carbon stocks or high biodiversity areas, leading to significant conversion of natural habitat, or involve land use change that is likely to reduce carbon stocks. Activities such as restoration or reconstruction of infrastructure destroyed in a disaster should be assessed using the sector notes in relevant sectors (e.g., buildings are covered in the section above, the Energy sector note covers power supply, the Transport sector note covers roads, etc.).

Urban Upgrading

Urban upgrading constitutes activities such as rehabilitation of historic districts and cultural heritage sites, slum upgrading, and public space improvements. Urban upgrading activities (i) supporting electric and non-motorized urban mobility (e.g., bike lanes, overpasses, footpaths, and sidewalk expansion); (ii) public space improvement (e.g., developing parks and green areas, street pedestrianization, and streetscape enhancements); and (iii) installation of LED public lighting are universally aligned provided they meet relevant conditions. Slum upgrading seeks to address existing deficits around land tenure, housing, and basic services through provision of affordable housing, and by expanding the coverage of water supply, sanitation, solid waste management, and road networks. Rehabilitation of historic districts and cultural heritage sites entails retrofit or restoration of buildings, and local infrastructure improvements. All such activities should be assessed using the guidance for relevant sub-sectors in this or other sector notes (e.g., affordable housing and retrofit or restoration of buildings should be assessed using the guidance on Buildings and solid waste management activities should be assessed using guidance for MSWM; water supply and sanitation, and urban roads should be assessed using the sector notes for Water and Transport respectively).

[5] Good practice to "build back better" after an emergency or disaster should explore lower-carbon alternatives to rehabilitate or reconstruct infrastructure, if feasible in a given sector and context.

Urban Planning and Management

Urban Planning activities undertaken with considerations of denser and more compact development, mixed land uses, or transit-oriented development contribute to the transition to less carbon-intensive urban forms and can be considered aligned on mitigation, provided they are consistent with the country's climate strategies. **Urban management** activities that provide general support to local governments, for example, in implementing and enforcing urban planning frameworks and regulations, undertaking urban service delivery, improving financial and asset management, can also be considered aligned. Other urban planning activities, such as developing land use and spatial plans and urban development regulations, influence urban growth patterns and built form and could have an impact on GHG emissions. Additionally, since urban built form is difficult to reverse, such activities could have risk of carbon lock-in. Such activities should be assessed based on the considerations discussed in **Urban Spatial Planning** (see DPF section).

Nature-Based Solutions (NBS)

NBS reduce disaster risk, build climate resilience, and provide benefits such as flood risk and heat stress reduction. NBS such as urban forests, open green spaces, green corridors, bioretention areas, river floodplains, natural inland wetlands, salt marshes, and mangrove forests can also assist in increasing carbon sinks. Several of these activities are universally aligned, provided that they do not expand or promote expansion into areas of high carbon stocks or high biodiversity areas, leading to significant conversion of natural habitat, or involve land use change that is likely to reduce carbon stocks.

Land Administration

Land Administration activities undertaken to facilitate land registration and improve tenure security, as well as to support land governance, land valuation and taxation, including digital databases and systems (excluding data centers) can be considered aligned on mitigation. Data centers and other buildings being financed should be assessed using guidance for **Buildings** and the Digital Development sector note. Similarly, activities that entail developing land use and zoning plans and associated regulations should be assessed using guidance for **Land Policy and tenure** or **Urban Spatial Planning** in the DPF section.

Measures for reducing risks

The main measures to address risks on mitigation include enabling activities that support the adoption of lower-carbon alternatives and practices, such as: technical assistance; knowledge exchange and capacity building to support waste prevention; developing integrated solid waste management plans; developing, updating, and enforcing building energy codes, etc.; enabling the client and/or project-implementing entities to develop and implement strategies or programs to promote energy efficiency or renewable energy in buildings (e.g., energy audits, energy performance benchmarking, etc.); designing and operating recycling facilities, landfills, energy recovery infrastructure; and undertaking detailed feasibility studies for landfills with gas capture or energy recovery systems, or feasibility studies to incorporate energy-efficient building measures.

Adaptation and resilience

Assessment of Risks from Climate Hazards

Assessment of risks from climate hazards consists of assessing the operation's level of exposure to current and future climate hazards and its vulnerability to such hazards, considering relevant adaptive capacities of human and natural systems. URL investments can be severely impacted by climate hazards such as extreme temperature and precipitation, flooding, droughts and desertification, and sea level rise and storm surge. For example, extreme precipitation and flooding can impact the operational performance of MSWM systems by affecting waste collection and transportation processes as well as disposal infrastructure.

Hurricanes and cyclones can damage buildings, while extreme temperatures, flooding, and sea level rise could make them uninhabitable in the long-term. Activities such as earthquake shelters or logistical supply chains (e.g., vaccine distribution) that are undertaken to address non-climate-related disasters could also be materially impacted by risks from climate hazards.

Assessment of risk from climate hazards in URL operations is highly location- and development-context driven. Country and location-specific climate information should be used, such as from the World Bank's Climate Change Knowledge Portal, along with expert judgment to determine the climate hazards most likely to be relevant for their operation. After identifying climate hazards relevant to the operation, its exposure to such hazards should be assessed under various climate change scenarios over suitable time frames, based on the nature and lifetime of activities and assets being created or services being provided by the project.[6] For example, the exposure of a housing scheme being undertaken in a flood-prone area needs to consider precipitation and flood scenarios over the lifetime of the scheme (i.e., 50 to 75 years). Once an operation's exposure to relevant climate hazards is known, their impact on activities financed by the operation must be assessed considering level of exposure and sensitivity; and the operation's vulnerability to these impacts should be determined based on its adaptive capacity.

Risk Reduction Measures

Risk reduction measures should be proportionate to the potential impact(s) of risks identified on the operation. Climate vulnerability can be addressed through a combination of hard and soft measures that are appropriate for the project's development context. The risk assessment should be used to prioritize climate hazards that need to be addressed by classifying the hazards that pose the highest potential risk to the operation's success based on their nature and scale of impact on the operation. A non-exhaustive illustrative list of risk reduction measures that can be used through the life cycle of relevant activities is provided below:

- **Planning:** Climate-informed land use and capital investment planning to prevent locating buildings and critical infrastructure and services in highly exposed areas, climate-resilient building codes, and climate risk-informed infrastructure design standards.
- **Systems Planning:** Measures implemented at a system level to ensure future investments are climate-resilient, for example integrating climate information (temperature, precipitation, and hydrology projections) into system planning to assess climate impacts on solid waste management systems.
- **Engineering and Design:** Climate-resilient design measures for protecting assets against climate hazards such as expanding drainage around landfills to prevent flood inundation; retaining walls along waterfronts; adopting cooling measures such as green roofs, natural ventilation, shading, and reflective glazing in buildings; selecting water-efficient, drought-resistant species and varieties for NBS and water-harvesting systems; use of traditional, adaptive materials in reconstruction of cultural heritage and housing, etc.
- **Operations and Maintenance:** Changes to the operating procedures of entities managing urban infrastructure assets and maintenance practices to proactively reduce the impact of climate hazards, for example regular monitoring of landfill slopes stabilization; undertaking regular structural audits for buildings located in hazard-prone areas; developing integrated drought management plans for NBS, etc.
- **Contingency Planning:** Measures to better equip entities managing infrastructure assets and urban inhabitants to cope with climate emergencies, such as developing early warning systems, evacuation procedures, and emergency protocols.

[6] Climate change scenario selection is an important aspect of determining an operation's climate hazard exposure and it is good practice to select at least two climate scenarios, such as a best-case low-GHG emissions scenario and high-GHG emissions scenario.

- **Institutional Capacity and Coordination:** Measures which can enhance the capacity of urban decision-makers and entities managing urban infrastructure and services to plan for and cope with impacts of climate hazards, for example training on climate risk assessment or emergency response planning, technical assistance on climate risk assessment and resilient design, etc.

2. Development Policy Financing: Main considerations in assessing Paris Alignment of URL operations

URL-related prior actions in Development Policy Financing (DPF) broadly comprise three categories: (i) urban development comprising reforms in urban spatial planning, building codes, housing, municipal finance, and solid waste management; (ii) disaster risk management (DRM) comprising reforms in emergency preparedness and response, disaster risk reduction and resilient reconstruction, and financial protection; and (iii) land comprising reforms in land policy and tenure, land administration and management, and geospatial services.

Mitigation

Most reform areas cited above do not increase GHG emissions and do not introduce or reinforce persistent barriers to the country's ability to pursue a low-emissions development pathway, and hence are considered aligned. Prior actions that support aligned activities discussed in section 1 are also aligned. However, urban spatial planning, building codes, and housing in category (i); disaster risk reduction and resilient reconstruction in category (ii); and land policy and tenure in category (iii) call for more scrutiny.

Urban spatial planning

Urban spatial planning policies, for example, land use and zoning regulations, spatial planning frameworks, etc. that influence the urban footprint and built form could lead to a significant increase in GHG emissions. The unsustainable urban form resulting from certain urban planning policies can be difficult to reverse and can introduce barriers to compact and low-GHG emission urban growth in the long term, locking-in carbon intensive built form and infrastructure. Such policies should be assessed based on factors such as spatial growth patterns in urban areas, relative location of different uses, public transit coverage and modal share, existence of policy frameworks regulating spatial growth, etc.

Building codes

New building design and construction standards, regulations for improving existing standards, and policies supporting building retrofit, rehabilitation, or renovation that will significantly increase the lifetime of the building stock that don't include provisions for improving energy performance could lead to an increase in energy use and associated GHG emissions. Since buildings are a long-lived asset type, such policies could lock-in energy-intensive building stock in the country for several decades and prevent the replacement of inefficient systems and technologies with lower-carbon options when they become available. These policies should be assessed further based on factors such as the energy mix in buildings, energy intensity of building stock (especially the need for space conditioning), etc. as well as presence of complementary regulations that manage energy demand.

Housing

Policies such as housing design regulations, construction standards, and housing incentive frameworks (i.e., housing subsidies or land-based financing incentives such as density bonuses) inform the design of assets or influence the built environment and could have a significant impact on GHG emissions. Such policies should be assessed further using the guidance for policies on **Urban Spatial Planning** or **Building Codes** discussed above, as applicable.

Disaster risk reduction and resilient reconstruction

Policies that comprise regulations and guidelines for retrofitting or reconstruction of infrastructure damaged during disasters could increase the lifetime of damaged assets or expand their physical footprint or capacity. In the absence of energy performance considerations, these policies could result in an increase in energy use and associated GHG emissions and should be assessed using guidance for policies on design and construction standards for relevant infrastructure type (e.g., refer to guidance on **Building Codes** for assessing policies on post-disaster reconstruction or retrofit of buildings).

Land policy and tenure

Land policies resulting in a loss of tree cover or forests could lead to a reduction in carbon sinks. In the long term, such policies could cause land use conversion, which is difficult to reverse. These policies should be assessed in the context of requisite regulatory frameworks for forest and biodiversity protection in the country.

Reducing the risks on mitigation: If carbon lock-in risks are identified from URL-related prior actions, it should first be determined if contextual factors or existing institutional frameworks could reduce such risks. If no such factors exist, complementary and credible measures by the government could be added to the policy being supported to reduce such risks to a low level. If relevant, the carbon lock-in risk from URL policies could be addressed through the repurposing of policy support to avoid or reduce the risk of introducing or reinforcing persistent barriers to the use of lower-GHG emissive alternatives without jeopardizing the development objectives. Examples of measures that can be incorporated in the prior action design include as applicable: (i) land use regulations supporting densification; (ii) building codes with energy performance requirements; and (iii) forest protection laws designating forest conservation areas to protect carbon sinks.

Adaptation and resilience

Risks from climate hazards could be relevant for policy actions on urban spatial planning, building codes, housing, and solid waste management in category (i); and emergency preparedness and response, and disaster risk reduction and resilient reconstruction in category (ii) as described below. Such policies should be assessed further using the process set out in the PA DPF Method.

Urban spatial planning

Policies that focus on urban footprint and built form and influence the urban built environment could be impacted by numerous climate hazards. If the country lacks relevant frameworks for managing risks from climate hazards, such policies may not achieve their intended outcomes and results.

Building codes

Building code reforms typically aim to improve the quality of the building stock in the country to meet increasing demand for housing, attract private sector investment, enhance resilience to hazards, etc. If such reforms do not consider climate hazards affecting the built environment in the country, these hazards could potentially hinder the achievement of their intended results. In some instances, they could also magnify present or future climate risks in the country.

Housing

Risks from climate hazards are relevant for policies that specify planning and design standards for housing (i.e., policies that inform the built environment). They could also be relevant for housing policies whose outcomes or intended results are indirectly linked to the built environment or asset creation. The impact

of climate hazards on such policies should be assessed using the guidance for **Urban Spatial Planning** or "Building Codes" as relevant.

Solid waste management

Policies that seek to improve waste management by setting up solid waste management frameworks and regulations (especially regulations for collection, transportation, and waste disposal and technical specifications for infrastructure) could be impacted by climate hazards and need to be assessed further.

Emergency preparedness and response

Policies focusing on improving preparedness for or response to non-climate related emergencies such as earthquakes, pandemics, etc. may be impacted by climate hazards prevalent in the country. Rapid onset climate hazards could potentially impact emergency preparedness and response reforms that don't consider climate risks and hinder the achievement of their intended results.

Disaster risk reduction and resilient reconstruction

Policies specifying planning or resilient reconstruction standards for non-climate disasters such as earthquakes may be impacted by climate hazards prevalent in the country and need to be assessed further. Since such policies deal with how the built environment is reconstructed after disasters, they can influence the urban footprint and built form for decades into the future, and therefore impact peoples' exposure to hazards such as sea level rise, flooding, drought, storms, and extreme heat.

Reducing the risks on adaptation: If risks from climate hazards are likely to have an adverse effect on the prior action's contribution to the Development Objective(s) as described above, risk reduction measures should be incorporated in the program design to bring residual risks to an acceptable level, in line with the DPF PA guidance. Such measures could include: (i) Strengthening the enabling environment for climate resilient urban development (e.g., policy frameworks facilitating the integration of climate risks into land use planning, capital investment planning, and urban development regulations; (ii) Instituting climate resilient infrastructure design standards and building codes; and (iii) Adopting emergency preparedness, response, and recovery frameworks.