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Resilient Infrastructure PPP: Key Lessons from Case Studies

This brief highlights lessons and recommendations from the comparative case studies in India, Japan, and Kenya to help inform governments intending to mainstream DRM into infrastructure development and PPPs, in particular.

These countries were selected because of their considerable provision for DRM in infrastructure PPP and the significance of their disaster vulnerabilities. A set of common lessons and themes could be derived from significantly different operating contexts as the case countries vary with respect to disaster risk profiles, levels of development, administrative and institutional arrangements, and dominant approaches to DRM in infrastructure PPPs. Nevertheless, several common themes have emerged that can inform PPP arrangements in other regions. This brief may be further updated based on best practices and lessons learned from other countries.

Government can play an important role in mainstreaming DRM, assuming uninsurable risks, and coordinating DRM and PPP policy. Case comparisons suggest that a strong DRM framework is likely to improve overall understanding of disaster risks for infrastructure projects and encourage direct attendance to issues of resilience in project structuring and contract design. Such frameworks also inevitably shape how well governments allocate disaster risks. Sound DRM frameworks can help governments ensure that risks are effectively assessed and available risk transfer tools and contractual options thoroughly and rigorously considered to help place risks with the parties best able to manage them. DRM frameworks also help promote the recoverability of critical services in the event of disasters and help government manage the assumption of uninsurable risks, where necessary, to make a potential PPP project viable and more resilient. This may particularly be the case for highly uncertain climate risks.

These frameworks and their associated strategies may differ significantly, however. Japan and India, for example, demonstrate two distinct approaches to allocating disaster risk. In Japan, public authorities have historically borne most natural disaster risk. As a result of accumulated PPP experience and the development of intensive risk assessment and consultative processes, however, Japan has gradually transferred disaster risks from public agencies to private operators. The early PPP market developed steadily because of the public sector's assumption of unforeseen risk, but once a large base of PPP projects was implemented, both government agencies and private operators could learn from the experiences of past disaster events and improved data to better assess and allocate risks.

In India, on the other hand, private entities often assume disaster risks. While there has been a fairly balanced allocation of disaster risk between the public and private parties from the outset, Indian developers have suffered significant losses until insurance claims were settled. These loss experiences, among other factors, could decrease private interest in PPPs as more frequent disaster events affecting PPP projects are anticipated. The Indian experience suggests that governments should carefully balance efforts to incentivize risk reduction and acceptance on the part of the private sector with the competing demands of developing a robust PPP market, which may require government to assume highly uncertain risks.

All these cases also suggest that there is much room to improve the coordination of DRM and PPP policy. Relevant specialized government agencies, including PPP units and agencies charged with overall coordination of DRM, can play key roles in integrating resilience principles into PPP policies.

Common definitions and understanding of climate and disaster risks between contracting authority and private developer are important: The definition and characterization of disaster risks applied in contracts are often still ambiguous. This may hinder private developers and government from preparing necessary emergency response and business continuity measures, complicate contracting, and limit the attractiveness of a PPP to potential private sector partners. The Japanese case studies, in particular, show that the lessons learned from previous projects have been applied to determine a clear definition of force majeure by applying quantitative criteria to characterize the severity of disasters. In addition, DRM legal frameworks at the national and regional levels are updated frequently based on the lessons learned from comprehensive study and inferences generated from disaster experiences.

While it may not be possible to employ a probabilistic risk-based approach to predict the effects of climate change over the design lifespan of an infrastructure asset, procuring authorities can adopt low-regret, adaptive strategies. These can be informed by VfM analyses of robust engineering designs and supported by sound performance standards, flexibility in PPP contracts, and use of insurance and other disaster risk financing tools. Decisions on risk reduction measures will inevitably depend on the infrastructure's vulnerability, criticality, and exposure to the potential impacts of climate change.

Government and private sector learning can improve future PPPs: Disaster risks become more apparent after countries experience natural disasters. All the case studies demonstrate that governments can successfully incorporate lessons from past disasters to improve future project planning and resilience to similar impacts. For instance, earthquakes are the most common and high-impact disaster events in Japan. Japan has developed clear definitions of earthquake force majeure events with seismic intensity tied to response terms.

Government, market, and sectoral contexts shape responses to disaster risks: The case studies are suggestive of some apparent differences in handling disaster risks in PPP across countries. These differences can be attributed to several factors, including the fiscal status of government, the prominence of DRM on the political and bureaucratic agendas, and the maturity of the PPP market. The fiscal status of a government affects the availability of funds for risk reduction investments, emergency response, and recovery that may be borne by the government, which inevitably constrains options available to government to manage risks. For instance, if a public entity is fiscally constrained, it is unlikely to bear high disaster risks. If this is a requirement to make a potential PPP viable, the project may no longer be bankable.

Moreover, government attention to DRM, in general, is likely to affect the capacity to integrate DRM considerations into PPP planning. If a country lacks a basic legal framework on DRM, the processes and legal requirements that focus attention to consideration of disaster risks in PPPs are likely to be limited. Such countries may not proactively assess the levels of disaster risks they face due to lack of data and capacity for effective analysis. Therefore, site-specific climate and disaster risk assessment during the early planning stage would be increasingly important to define the resilient engineering designs and KPIs for risk-informed O&M.

The maturity of the PPP market, including the degree to which risk allocation arrangements have been market tested, influences how willing private developers will be to participate in PPPs in hazard-prone areas. Private participation is likely to improve with developed and tested risk transfer products (for example, insurance) that cover major and frequent natural disasters with a rational range of premium fees or in the presence of a developed reinsurance market.

Sector characteristics will also influence risk allocation. A sector's importance to economic activity, national security, environmental quality, and public safety influences the risk government is willing to bear. Moreover, technical complexity, sector profitability, and the ability of operators to control revenues (for example, by the right to set user fees) all have an impact on operator willingness to bear disaster risks. Public authorities are often best positioned to bear disaster risks for socially or economically critical infrastructure projects, particularly if these projects are characterized by low profitability.

Indeed, a complex and unique combination of factors affects decisions regarding risk allocation, and there is no single rule to determine perfect risk allocation. Experiences from past disasters can offer policy makers insights, however, to formulate better frameworks and measures to incorporate disaster resilience in future PPPs. By extending case comparisons and continuing to document lessons, governments and development partners can, at the very least, ensure that the most important questions regarding disaster are considered in PPP arrangements. With more experience, effective and rigorous risk assessment techniques, robust engineering designs, disaster risk financing tools, and efficient risk allocation arrangements may be customized and applied to improve the resistance and recoverability of infrastructure PPPs.

World Bank DRM Hub, Tokyo

The World Bank Tokyo Disaster Risk Management (DRM) Hub supports developing countries to mainstream DRM in national development planning and investment programs. As part of the Global Facility for Disaster Reduction and Recovery, the DRM Hub provides technical assistance grants and connects Japanese and global DRM expertise and solutions with World Bank teams and government officials. The DRM Hub was established in 2014 through the Japan-World Bank Program for Mainstreaming DRM in Developing Countries – a partnership between Japan's Ministry of Finance and the World Bank.

GIF

The Global Infrastructure Facility (GIF) is a global collaborative platform that facilitates the preparation and structuring of complex PPPs in infrastructure and the mobilization of capital from the private sector and institutional investors.

GFDRR

The Global Facility for Disaster Reduction and Recovery (GFDRR) is a global partnership that helps developing countries better understand and reduce their vulnerabilities to natural hazards and adapt to climate change. Working with over 400 local, national, regional, and international partners, GFDRR provides grant financing, technical assistance, training, and knowledge sharing activities to mainstream disaster and climate risk management in policies and strategies. Managed by the World Bank, GFDRR is supported by 36 countries and 10 international organizations.

PPIAF

PPIAF provides technical assistance to governments to support the creation of a sound enabling environment for the provision of basic infrastructure services by the private sector. PPIAF also supports the generation and dissemination of knowledge on emerging practices on matters relating to private sector involvement in infrastructure.

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