

# **Navigating Challenges: Infrastructure Project Delivery in Conflict Zones <sup>1</sup>**

**Yamanta Raj Niroula, PMP**

## **Abstract**

Managing infrastructure projects in conflict zones presents unique challenges and requires specialized approaches to ensure successful outcomes. This paper explores the distinct considerations, strategies, and best practices for managing infrastructure projects in complex environments affected by conflict. The initial focus of this study is to explore the existing body of knowledge on infrastructure delivery in conflict zones. The study aims to investigate the specific challenges of infrastructure delivery and provide a comprehensive understanding of the issues, including security risks, resource constraints, and logistical challenges. Subsequently, it stresses the critical role of strategic planning and the need for an adaptive project management approach that can address the challenges posed by the unpredictable nature of conflict zones. It highlights the importance of being able to adapt and respond to evolving circumstances in such challenging environments. The paper emphasizes the significance of stakeholder engagement and communication as vital components that foster transparency, trust, and project accountability. It discusses the importance of monitoring and evaluation in conflict-affected projects. It also highlights the importance of building resilient teams and leadership, accentuating the value of a supportive team culture. Additionally, it explores the aspects of risk management, emphasizing the need for contingency plans and flexible approaches to address the ever-changing conditions in conflict zones. Lastly, the paper concludes by drawing insights from brief case studies of infrastructure projects undertaken in conflict zones, showcasing valuable lessons learned and best practices.

**Keywords:** *project delivery, conflict zones, challenges, strategic planning, risk management, adaptive project management, stakeholder engagement, communication, monitoring and evaluation, resilient teams, leadership, adaptability, lessons learned, best practices, sustainable development.*

---

<sup>1</sup> How to cite this paper: Niroula, Y. R. (2023). Navigating Challenges: Infrastructure Project Delivery in Conflict Zones; *PM World Journal*, Vol. XII, Issue VII, July.

## **1. Introduction**

Conflict has been a significant factor in shaping civilizations throughout history, arising from several factors such as political differences, resource disputes, and ethnic tensions. In recent years, the global landscape has witnessed a significant increase in conflicts of low and medium intensity.

According to the “Global Conflict Barometer” report published by the Heidelberg Institute for International Conflict Research (HIIK), there has been a steady increase in conflicts of low and medium intensity. In 2022, the HIIK recorded 363 violent conflicts, representing an increase of eight compared to the previous year. The number of large-scale armed conflicts increased from 20 in 2021 to 21 in 2022, with one war observed in Europe between Russia and Ukraine and another in the Americas due to inter-gang rivalry in Haiti (HIIK, 2023). Recently, a fresh military conflict erupted in Sudan on April 15, 2023. As of this writing, between 3,000 to 5,000 people have been killed and 6,000 to 8,000 others are injured while 2 million are internally displaced and 530,000 others have fled the country as refugees (Wikipedia, 2023). Important public infrastructure, such as hospitals, schools, transportation systems, and communication networks, have been severely damaged and require immediate and extensive reconstruction.

As noted by the Association for Project Management (APM), managing infrastructure projects in conflict zones or situations requiring humanitarian relief presents distinct challenges compared to conventional workplace environments (APM, 2022). While infrastructure projects in traditional workplaces are typically carried out under stable and predictable conditions with established project management processes, the circumstances in conflict zones can differ significantly.

Let us consider, for instance, a construction project aimed at rebuilding the infrastructure of a war-torn country, including schools, hospitals, roads, and water supply systems. Managing such projects in conflict zones entails navigating distinct complexities and risks, necessitating specialized approaches and strategies for success. Common challenges in managing infrastructure projects in conflict zones include security concerns, limited resource availability, political instability, cultural differences, and logistical and supply chain constraints.

This paper explores the complexities of managing infrastructure projects in conflict zones and provides practical guidance and strategies to help project managers overcome the associated challenges. By taking a holistic approach, infrastructure projects in conflict zones can play a vital role in rebuilding communities and supporting post-conflict recovery.

## **2. Unveiling the landscape: Analysis of infrastructure delivery in conflict zones**

### **2.1. Safety and security**

Ensuring the safety and security of personnel, equipment, and materials is a critical concern when managing infrastructure projects in conflict zones. The United Nations Department of Safety and Security (UNDSS) emphasizes the importance of security planning, risk assessment, and

collaboration with security specialists and local authorities. Measures such as establishing secure perimeters, deploying trained security personnel, and utilizing surveillance technology are recommended (UNDSS, 2017). Additionally, developing a proactive security culture within organizations is crucial for successful security management (Quigley, 2008).

## **2.2. Political and legal complexity**

Managing infrastructure projects in conflict zones requires a full understanding of the local political and legal landscape, including regulations, permits, and legal frameworks. Utilizing power and politics to our advantage can increase the likelihood of project success (Pinto, 1996). Clear communication, collaboration, and joint decision-making are essential when engaging with stakeholders and navigating legal challenges. Flexibility in recognizing the validity of other applicable principles and seeking innovative solutions that reconcile or integrate seemingly contradictory principles is crucial in negotiations (Morris & Pinto, 2004).

## **2.3. Stakeholder management**

Stakeholder management is essential, where there are diverse interests and competing priorities. A stakeholder register, an analysis of stakeholder interests, conflict resolution, communication planning, negotiation skills, and building trust and respect can help balance stakeholder needs. A three-pronged approach consisting of engagement, alignment, and influence can be used (Englund & Bucero, 2019). Successful stakeholder management requires understanding major stakeholders and their social identity (Köster, 2010). Transparent communication, collaborative efforts, consultations, constructive dialogue, and collective decision-making are key elements of stakeholder engagement and successful management of legal obstacles (Kujala, et al., 2022). Engaging with local communities, armed groups, government entities, and international organizations necessitates cultural sensitivity and adaptability. Community consultations, negotiation strategies, and grievance resolution mechanisms can ensure positive relationships and contribute to project success.

## **2.4. Resource constraints**

In conflict zones, limited infrastructure, inadequate resources, and disrupted supply chains are common challenges. Balcik (2010) has suggested some strategies to overcome resource constraints, such as resource planning, alternative procurement, and collaboration with humanitarian actors (Balcik, et al., 2010). Nguyen (2004) has emphasized the importance of resource management throughout the project life cycle (Nguyen, et al., 2004). Utilizing sustainability principles increases project efficiency and impact while reducing unfavorable social and environmental effects, ensuring long-term viability and resilience (Gagnon, et al., 2009).

## **2.5. Infrastructure damage and rehabilitation**

Restoring critical infrastructure for essential services after hostilities, whether occurring during a conflict or in its aftermath, is a multifaceted and challenging endeavor (Hay, et al., 2020). Understanding the type and extent of damage is essential for project planning for reconstruction programs, which can be facilitated by detailed, strict, and transparent damage assessment (Jha, et al., 2010). Ensuring detailed reconstruction plans, suitable techniques, and balancing speed, quality, and cost while considering long-term community needs are important.

## **2.6. Cultural sensitivity and local context**

Understanding the local culture and context is crucial for successful delivery of infrastructure projects where cultural sensitivity, trust-building, and communication hold significant importance (Dawar & Ferreira, 2021). Special attention must be given to the diversity and complexity of infrastructure projects, primarily due to differences in context. Infrastructure projects in such areas must address challenges arising from variations in infrastructure, jurisdiction, and cultural factors (Mashatt, et al., 2008). Being familiar with the national culture of the countries in which the project is implemented is considered crucial for overcoming problems caused by cultural differences. Additionally, knowledge sharing with individuals from diverse cultural backgrounds and areas of expertise is seen as a key factor in project success (Kivrak, et al., 2009).

## **2.7. Humanitarian principles**

Humanitarian action is guided by principles of humanity, impartiality, neutrality, and independence. These principles, originating from international humanitarian law, are endorsed by the United Nations in General Assembly Resolutions 46/182 and 58/114. They are further reinforced by the Code of Conduct for the International Red Cross and Red Crescent Movement and Non-Governmental Organizations in disaster relief, as well as the Core Humanitarian Standard on Quality and Accountability (United Nations High Commissioner for Refugees, 2023).

Infrastructure delivery in conflict zones intersects with humanitarian efforts, necessitating adherence to humanitarian and “do no harm” principles. The “do no harm” principle, originally derived from medical ethics, calls for humanitarian and development actors to actively minimize unintended harm caused by their presence, assistance, and services (International Federation of Red Cross and Red Crescent Societies, 2016). The importance of prioritizing the needs of affected population, promoting sustainability, and demonstrating social responsibility cannot be overstated.

## **2.8. Risk management**

Risk management, identifying and mitigating the risks that can impede the project, is essential for preventing failures (Nieto-Rodriguez, 2021). Managing risks requires thorough risk assessments, contingency planning, and strong risk management frameworks. Anticipating and mitigating potential threats such as armed attacks, political instability, and logistical challenges are essential

considerations for management which also requires maintaining situational awareness and flexibility (Smith, et al., 2014). This necessitates a complete understanding of the sources and factors that contribute to conflict and fragility (Cox & Thornton, 2010).

It is important that planning is done in an agile manner, each phase is fine-tuned, outputs are delivered, and risks are handled. Things are fixed if they go wrong and the scope, time or cost are sometimes changed. This is done less if research is done well, risks are planned for, and outputs are monitored (Manas, 2006).

### **2.9. Post-conflict transition**

Adopting inclusive approaches to post-conflict transition, with a focus on sustainable recovery and development, holds significant importance in conflict-affected areas. It signifies the need for a holistic and integrated approach that addresses not only the immediate emergency response but also the long-term challenges and needs of the affected population. This approach recognizes the interconnections between various sectors such as infrastructure, livelihoods, health, education, and governance (World Bank, 2011).

### **2.10. Sustainability**

Incorporating sustainability principles maximizes project efficiency while minimizing negative environmental and social consequences, ensuring long-term viability and resilience. Sustainability goes beyond environmental concerns and involves assessing risks related to human rights, ethical practices, and end user issues (Tharp, 2012). It requires organizations to prioritize fair work practices, including safe working conditions while avoiding exploitative practices such as child and forced labor. Respecting human rights, promoting ethical business practices, and addressing beneficiaries' concerns are also essential components of sustainability. This approach involves conducting due diligence, promoting transparency and accountability, and empowering beneficiaries to make informed choices. By managing risks and implementing sustainable practices, organizations can contribute to a more equitable, responsible, and sustainable environment.

### **2.11. Project management best practices**

In conflict zones, effective project management practices are crucial to address complex requirements. Ensuring timely delivery of infrastructure and essential services is paramount. However, challenges may arise due to complex requirements and limited availability of resources. To mitigate these challenges, project managers can adopt project management strategies that incorporate lessons learned and best practices.

Project managers play a crucial role in being adaptable and responsive to the needs of the community, ensuring that their involvement remains meaningful. It is essential for beneficiaries to have a sense of ownership and active participation throughout the project planning and

implementation phases (Earnest, 2019). It is critical for the project managers to engage and consult with the beneficiaries during project design and implementation, allowing their input and involvement to shape the project's success.

### **3. Key challenges to infrastructure project delivery in conflict zones**

According to the Project Management Body of Knowledge (Project Management Institute, 2021), a project is a temporary endeavor with the goal of producing a unique product, service, or outcome. The term "unique" in this definition highlights the importance of treating each project as a one-of-a-kind initiative. This entails considering multiple factors to achieve the project's objectives and strategic position.

Managing infrastructure projects in conflict zones presents a myriad of challenges that have a significant impact on project planning, execution, and overall success. These challenges include, but are not limited to the following:

#### **3.1. Security risks**

Conflict zones present significant security risks and safety concerns due to the presence of armed conflict, insurgencies, and volatile environments. These threats can disrupt project activities, cause delays, and endanger project personnel, equipment, and materials. Ensuring the safety and security of all project components is a paramount challenge in these high-risk areas.

#### **3.2. Limited infrastructure**

Conflict zones often suffer severe damage to infrastructure such as roads, bridges, buildings, utilities, and communication networks due to armed conflict and other destructive acts. This damage can hinder access to project sites, transportation of materials, and establishment of necessary utilities. As a result, infrastructure projects in these areas face significant challenges and require careful planning and innovative solutions to overcome the obstacles posed by limited infrastructure.

#### **3.3. Political and legal complexity**

Project implementation in conflict zones is characterized by intricate political dynamics, unstable governance structures, and ever-evolving legal frameworks. Conflicting political interests among stakeholders can hamper project progress. The absence of consistent legal systems further complicates project execution, as laws and regulations may change or be subject to interpretation.

#### **3.4. Humanitarian considerations**

Conflict zones present complex socio-economic challenges related to displaced populations, humanitarian needs, and fragile social systems. Mass displacement caused by conflict creates significant challenges in ensuring the well-being of affected populations. Navigating these

dynamics requires collaboration with humanitarian organizations, local communities, and relevant stakeholders to address the specific needs and vulnerabilities of those impacted by conflict.

### **3.5. Cultural and language barriers**

Coordinating with local communities, stakeholders, and project team members in conflict zones can be challenging due to cultural and language barriers. Cultural norms, customs, and traditions vary across regions, requiring project managers to approach interactions with sensitivity and adaptability. Language barriers can hinder communication, making it essential to employ skilled interpreters or translators to facilitate clear information exchange.

### **3.6. Limited resources and capacity**

Infrastructure projects in conflict zones often face challenges due to limited resources and technical expertise. Ongoing conflict can severely impact the availability and quality of materials, equipment, and workforce. Economic instability may limit financial resources, while skilled laborers and professionals may be displaced or lack access to education and training. The destruction or disruption of infrastructure and supply chains further exacerbates resource constraints.

### **3.7. Constrained logistics and supply chain**

Restricted access, disrupted routes, and limited availability of goods and services can create challenges in transportation, procurement, and supply chain management. Ongoing conflicts can impede the transportation of materials, equipment, and personnel through restricted movement, checkpoints, and damaged infrastructure. Procurement processes may encounter difficulties in obtaining resources due to disrupted markets and limited supplier networks. The scarcity of essential goods and services can lead to increased costs and delays.

### **3.8. Safety and environment**

Infrastructure projects in conflict-affected areas must address environmental and safety concerns such as damaged infrastructure, unexploded ordnance, and other hazardous conditions. Conflict can leave behind remnants of explosives or munitions, posing significant risks to project personnel and local communities. Damaged infrastructure and environmental hazards such as contaminated sites or disrupted ecosystems require careful mitigation to minimize harm and ensure sustainable development.

### **3.9. Stakeholder engagement and community relations**

Building trust and maintaining positive relationships with diverse stakeholders, including local communities, government authorities, and non-governmental organizations, is crucial but challenging in conflict zones. Conflicts can exacerbate existing tensions and divisions, making it essential to address complex socio-political dynamics.

### **3.10. Monitoring and evaluation**

Assessing project progress, impacts, and success in conflict zones is challenging due to limited data, security concerns, and dynamic project circumstances. The volatile nature of conflict zones can make it challenging to collect and monitor data. This can make it difficult to obtain the information needed to assess project success. Security concerns may limit access to project sites, which can hinder monitoring team's ability to track progress. The dynamic nature of conflict environments can result in shifting priorities and unpredictable project dynamics.

A recurring obstacle in addressing these challenges is the absence of a proper understanding of the situation. This understanding must be based on reliable evidence regarding local conditions, infrastructure status and functionality, as well as the specific needs of the local population.

## **4. Essential strategies for successful infrastructure delivery in conflict zones**

### **4.1. Strategic planning and risk management**

All projects are subject to risk. The world is constantly changing, and success depends on the ability to change with it (Rolstadås, et al., 2011). Unfortunately, many project managers still fail to recognize the importance of risk management as a key process in project delivery.

Strategic planning and risk management are essential for successful infrastructure delivery in conflict zones. Project managers must carefully analyze the context, set realistic objectives, engage stakeholders, and proactively identify and mitigate risks. This involves assessing the local context, understanding specific needs and priorities, identifying available resources, and developing a clear roadmap for successful infrastructure delivery.

#### **4.1.1. Contextual analysis and assessment**

Thorough contextual analysis and assessment are essential for project managers working in conflict zones. This involves understanding the political, social, economic, and security dynamics that affect the project. By analyzing the conflict context, identifying key stakeholders, assessing community needs, and understanding available resources, project managers can lay the foundation for strategic planning and ensure that projects are aligned with the unique context.

#### **4.1.2. Setting realistic objectives and priorities**

In conflict zones, it is vital to set realistic objectives that consider the limitations and challenges of the context. Clear project objectives provide a framework for decision-making and resource allocation. Project managers must establish priorities that address the urgent needs of affected communities while considering long-term sustainability and development goals. Regularly reviewing and updating objectives as the context changes ensures that projects remain relevant throughout their lifespan.



### **4.1.3. Stakeholder engagement and collaboration**

Meaningful stakeholder engagement and collaboration are essential for successful project delivery in conflict zones. Engaging with local communities, authorities, and conflict actors creates a sense of ownership, enhances project acceptance, and promotes sustainable outcomes. Project managers must establish mechanisms for consultation and dialogue to ensure diverse perspectives and needs are considered throughout the project lifecycle. This is important because it can help to identify potential risks and challenges, improve decision-making, increase buy-in from stakeholders and improve the overall quality of the project. Collaborating with humanitarian agencies, peacebuilding organizations, and development partners can leverage resources, expertise, and local networks.

### **4.1.4. Risk identification and mitigation strategies**

Risk identification and mitigation take on great significance in undertaken in conflict zones. Project managers must proactively assess the risks to ensure project continuity. This includes identifying security threats, assessing supply chain reliability, evaluating financial risks, and considering the impact of political instability. Developing risk management strategies, contingency plans, and response mechanisms allows project teams to anticipate and address challenges. Regular monitoring, adaptation, and communication are critical to managing risks throughout a project lifecycle.

## **4.2. Adaptive project management approaches**

In conflict zones, project managers must embrace adaptive project management approaches to deal with dynamic and unpredictable environments. Adaptive Project Management involves just enough planning to ensure the team is working on the correct tasks (Silber, 2017). Conventional project management methodologies, which are often based on the assumption of a stable environment, may not be applicable in dynamic environments. This means that circumstances can change rapidly, priorities can shift, and unforeseen challenges can emerge.

To be effective in dynamic environments, project managers need to adopt a different approach. This approach should focus on flexibility, adaptability, and stakeholder involvement.

### **4.2.1. Flexibility and responsiveness**

Flexibility is a core component of adaptive project management. Project managers need to anticipate and embrace the probability of evolving circumstances, shifting priorities, and unforeseen events. This requires agile decision-making, rapid adjustments, and the ability to capitalize on emerging opportunities. By developing a culture of adaptability, project teams can proactively address new challenges, modify project plans, and maintain progress amid uncertainty.

#### **4.2.2. Agile methods and modular design**

Implementing agile methods and modular design principles can enhance project adaptability. Agile methodologies prioritize iterative and incremental development, enabling frequent feedback and adjustments. This is important in conflict zones, where the situation can change quickly, and projects may need to be adapted on the fly. Modular design breaks projects into smaller components. It ensures flexibility by allowing modifications to specific modules without disrupting the project's progress. This is important as resources may be limited in conflict zones, and it may be difficult to make changes to large and complex projects.

#### **4.2.3. Contingency planning and emergency response**

Infrastructure projects in conflict zones must incorporate contingency planning and emergency response mechanisms. Project managers must anticipate potential disruptions, identify critical dependencies, and develop contingency plans to address unforeseen events. This may involve establishing alternative supply chains, redundant systems, and backup resources. Additionally, project teams must be well-prepared to swiftly respond to any security incidents to safeguard personnel and project assets.

#### **4.2.4. Collaborative decision-making**

Adaptive project management necessitates collaborative decision-making processes. Project managers need to cultivate an environment that promotes transparent communication, inclusive participation, and collective decision-making among project team members and stakeholders. Through regular feedback mechanisms, periodic evaluations, and lessons learned sessions, the project team can continuously monitor project performance, identify required adjustments, and make informed decisions. Flexibility, agile methodologies, contingency planning, and collaborative decision-making enable project teams to overcome the challenges of volatile and unpredictable environments and keep projects on track. Adaptive leaders facilitate this process by empowering team members, valuing diverse perspectives, and creating a culture of learning and innovation.

### **4.3. Safety and security**

In infrastructure projects executed in conflict zones, managing security risks and safeguarding personnel, equipment, and project sites are top concerns. The unpredictable and unstable nature of such environments necessitates the adoption of stringent security measures and comprehensive safety procedures (Manley, 2009).

The distinct challenges presented by conflict zones, including the presence of armed groups, potential for violence, and absence of law and order, require an intensified focus on security. Project managers must conduct exhaustive security evaluations to identify potential risks and

vulnerabilities specific to the project location. This entails assessing the prevailing political landscape, local conflicts, and security threats in the area.

#### **4.3.1. Threat assessments and security protocols**

Performing detailed threat assessments is crucial to identifying and understanding the security risks specific to the project location. Project managers must collaborate with security specialists and local authorities to evaluate potential threats such as armed conflict, terrorism, theft, and vandalism. Security protocols must be established based on these evaluations. By staying up to date on security updates and actively gathering intelligence, project managers can make informed decisions, adjust project plans as needed, and implement appropriate security measures to mitigate risks. These proactive measures enhance the overall safety and security of the project team.

#### **4.3.2. Personnel safety and security training**

In any project, prioritizing the safety and well-being of project personnel is of utmost importance. Project managers are responsible for ensuring that all team members are fully aware of essential safety measures. This includes knowledge of site-specific risks, hazard identification, emergency response procedures, and the proper use of personal protective equipment (PPE). To enhance preparedness and minimize the potential impact of security incidents, regular safety drills, first aid training, and evacuation protocols must be established. Additionally, ongoing safety awareness campaigns and communication channels should be maintained to promote a safety culture among project team members.

#### **4.3.3. Secure site management and access control**

Ensuring site security is essential in conflict zones. Project managers must establish controlled access points, implement identity verification procedures, and monitor site entry and exit. Regular site inspections, perimeter patrols, and surveillance systems can deter unauthorized access and enhance overall site security. Additionally, the storage and protection of materials, equipment, and valuable assets must be prioritized to prevent theft and damage.

#### **4.3.4. Emergency preparedness and crisis management**

Infrastructure projects in conflict zones must have emergency preparedness and crisis management plans in place. Project managers must anticipate potential emergencies and develop response mechanisms to address various scenarios. This includes establishing communication protocols, emergency contact lists, and evacuation plans. Collaboration with local authorities, security forces, and humanitarian agencies can enhance the effectiveness of emergency response efforts. Regular drills, simulation exercises, and post-incident evaluations are essential for continuous improvement and learning.

#### **4.4. Procurement and supply chain management**

Procurement and supply chain management are crucial components of infrastructure projects. The complex and challenging operating environments necessitate that project managers establish efficient and resilient procurement processes, ensure the timely delivery of materials and equipment, and manage the risks associated with supply chain disruptions.

##### **4.4.1. Assessing local market conditions**

Understanding the local market conditions and identifying reliable suppliers are essential for successful procurement in conflict zones. Project managers must conduct a detailed assessment of available local suppliers, their capacity, and their track record. This involves evaluating factors such as quality standards, delivery capabilities, pricing structures, and compliance with legal and regulatory requirements. Engaging local suppliers not only contributes to the local economy but also minimizes logistical challenges and enhances cultural understanding.

##### **4.4.2. Establishing robust procurement processes**

Establishing robust procurement processes is essential to ensure transparency, accountability, and fairness. Project managers must implement clear procurement policies and procedures that comply with international standards and local regulations. This includes defining evaluation criteria, conducting competitive bidding processes, and incorporating conflict-sensitive procurement practices. Maintaining proper documentation and record-keeping throughout the procurement process is crucial for auditability and accountability.

##### **4.4.3. Managing supply chain risks**

Conflict zones often pose significant challenges to the supply chain, including logistical constraints, security risks, and limited transportation options. Project managers must identify potential supply chain risks and develop mitigation strategies. This may involve establishing alternative supply routes, diversifying suppliers, and implementing tracking and monitoring systems to ensure the timely delivery of materials and equipment. Collaboration with logistics specialists, local partners, and humanitarian agencies can provide valuable insights and support in managing supply chain risks.

##### **4.4.4. Procuring sustainable and conflict-sensitive materials**

Promoting sustainability and conflict sensitivity in procurement decisions can have positive social and environmental impacts in conflict zones. Project managers must prioritize the procurement of materials and equipment that are ethically sourced, environmentally friendly, and compliant with international standards. This includes considering the social and environmental impacts of raw material extraction, promoting fair trade practices, and avoiding the use of conflict minerals. Engaging with local communities and stakeholders can help ensure that procurement decisions align with local values and contribute to sustainable development.

#### **4.5. Building partnerships for project success**

Establishing partnerships and collaborative relationships is vital for infrastructure delivery within conflict zones. The complex and challenging nature of these environments necessitates that project managers engage with a range of stakeholders, including local communities, government entities, humanitarian organizations, and development partners. Partnership with other humanitarian organizations and integrating their expertise can significantly contribute to successful project outcomes. Collaboration, partnership, interoperability, information sharing, and coordination are key elements that contribute to working as one and achieving successful outcomes.

##### **4.5.1. Engaging local communities**

The engagement and active involvement of local communities play a critical role in the success and long-term sustainability of infrastructure projects in conflict zones. Project managers must prioritize meaningful community participation and consultation throughout the project lifecycle. This includes conducting community needs assessments, incorporating local knowledge and perspectives into decision-making processes, and promoting social inclusion. Engaging local communities ensures that the project is owned by the community, builds trust between the project team and the community, and ensures that the project aligns with the needs and aspirations of the community.

##### **4.5.2. Collaboration with government entities**

Collaborating with government entities at various levels is essential for navigating the regulatory landscape and ensuring project alignment with local development priorities. Project managers must establish communication channels with relevant government departments, engage in regular dialogue, and seek their support and guidance. Collaborating with government entities also facilitates access to necessary permits, licenses, and approvals, streamlining project implementation processes.

##### **4.5.3. Partnerships with humanitarian and development organizations**

Partnerships with humanitarian organizations and development agencies can bring valuable expertise, resources, and networks to infrastructure projects in conflict zones. Project managers must seek collaborations with relevant organizations that have local experience. These partnerships can contribute to the delivery of essential services, capacity building initiatives, social infrastructure development, and long-term community resilience. Working closely with humanitarian and development partners enhances project outcomes and supports sustainable development goals.

##### **4.5.4. Private sector engagement**

Engaging the private sector can bring unique perspectives, technical expertise, and financial resources to infrastructure projects in conflict zones. Project managers must explore opportunities

for private sector involvement, such as through public-private partnerships (PPPs) or corporate social responsibility initiatives. Collaborating with private companies can improve project efficiency, encourage innovation, and create jobs, which can contribute to local economic development and stability.

#### **4.5.5. Cross-sector collaboration**

Cross-sector collaboration is crucial in tackling the intricate challenges of infrastructure projects in conflict zones. Project managers must cultivate collaboration among a wide range of stakeholders, including government agencies, civil society organizations, local communities, private sector entities, and international organizations. This collaborative approach encourages the sharing of knowledge, resources, and ideas. Regular coordination meetings, collaborative planning sessions, and inter-agency partnerships help to improve project outcomes and achieve sustainable development.

#### **4.6. Monitoring and evaluation**

Monitoring and evaluation (M&E) are vital components of infrastructure delivery in conflict-affected environments. In conflict zones, where operating conditions are challenging and unpredictable, project managers must establish rigorous M&E mechanisms to track progress, measure project performance, and ensure accountability.

##### **4.6.1. Importance of M&E**

M&E offers project managers valuable insights into project implementation, progress, and outcomes. By systematically gathering and analyzing data, project managers can make informed decisions, identify potential issues and risks, and adjust project strategies accordingly. Monitoring enables real-time tracking of project's progress, outputs, and milestones, while evaluation assesses the overall efficiency, impact, and sustainability of the project. Together, M&E facilitate project learning, adaptive management, and the achievement of project goals.

##### **4.6.2. Developing M&E framework**

Project managers must create a comprehensive M&E framework that is tailored to the specific context of the conflict-affected infrastructure project. This framework must define clear objectives, indicators, data collection methods, and reporting mechanisms. It must also consider the unique challenges and risks associated with the operating environment, such as security constraints, limited access to project sites, and data collection in volatile settings. Involving relevant stakeholders, including local communities and project beneficiaries, in the design of the framework ensures that evaluation processes are owned by the stakeholders and that they align with local needs and priorities.

#### **4.6.3. Real-time data collection and reporting**

In conflict-affected infrastructure projects, real-time data collection and reporting are crucial for M&E. Project managers must leverage technology and digital tools to streamline data collection, enhance data accuracy, and enable timely reporting. This may involve using mobile data collection applications, remote sensing technologies, and cloud-based data storage systems. Regular reporting and data sharing with relevant stakeholders promote transparency, accountability, and collaborative decision-making.

#### **4.6.4. Participatory monitoring and evaluation**

Participatory approaches to M&E are especially relevant in conflict-affected environments. Involving local communities, project beneficiaries, and other stakeholders in the M&E process not only improves data collection and accuracy but also empowers communities to play an active role in project oversight and management. Participatory methods, such as focus group discussions, community scorecards, and participatory mapping, enable the inclusion of diverse perspectives, local knowledge, and contextual insights into the evaluation process.

#### **4.6.5. Learning and adaptation**

M&E must not be viewed merely as a reporting exercise but as a process of learning and adaptive management. Project managers must utilize the findings from M&E activities to inform decision-making, identify areas for improvement, and adjust project strategies accordingly. Regular reflection, lessons learned sessions, and knowledge sharing among project team members and stakeholders facilitate continuous learning and enhance project performance over time.

#### **4.7. Establishing and managing resilient teams**

Resilient teams are essential for successful infrastructure delivery in conflict zones because they can adapt to change and overcome challenges. They consist of individuals who are dedicated to the project, have a strong work ethic, and can perform well under pressure. Effective leadership is crucial in establishing resilient teams in conflict zones. It motivates and inspires team members while creating a positive and supportive work environment. Strong leaders guide and motivate team members, while clear communication ensures alignment with project goals and open sharing of ideas and concerns. A supportive team culture that values trust, collaboration, and unity enhance the team's ability to overcome challenges and succeed in project delivery. By prioritizing these aspects, project managers can build resilient teams that deliver successful projects.

### **5. Case studies: Successful infrastructure projects in conflict zones**

In this section, we will explore case studies of successful infrastructure projects implemented in conflict zones. These projects have overcome numerous challenges, applied best practices and achieved positive outcomes in difficult operating environments. By examining these case studies,

we can gain valuable insights into infrastructure delivery strategies in conflict zones. The goal is to identify critical success factors and extract valuable lessons from the approaches taken in infrastructure delivery within conflict and post-conflict zones.

These brief case studies draw upon the author's extensive infrastructure delivery experiences in Afghanistan and Nigeria. The following sections focus on analyzing the project lifecycle, exploring common infrastructure delivery practices, and highlighting the essential tools and techniques.

### **5.1. A Remarkable Feat: Rebuilding Health and Education Facilities in Afghanistan**

A large construction project was undertaken to rebuild health and education facilities in Afghanistan. The Construction of Health and Education Facilities (CHEF) project built two new hospitals to meet the medical needs of over two million Afghans. It also constructed three midwife training centers to benefit over one million Afghans. These health facilities support the Ministry of Public Health in providing essential health services, such as referral and treatment for in-patients and out-patients. The hospitals also serve as training venues for health professionals, as well as places for medical conferences and seminars. The CHEF project also built four Provincial Teacher Training Centers (PTTC) to address the teacher training goals identified by the Ministry of Education. These goals were:

- to provide the necessary infrastructure to educate teacher trainers and teachers.
- to strengthen the educational standards of the country; and
- to increase the quality and quantity of teachers.

(United States Agency for International Development, Afghanistan, 2012)

Despite the insecure and challenging environment in Afghanistan, the project team triumphed over numerous obstacles to deliver impactful results. The project faced logistical complexities, security risks, and limited access to resources, demanding innovative approaches.

To overcome these challenges, the project team forged strong partnerships with local contractors, communities, and government entities. They adopted a proactive approach, actively involving local communities in decision-making processes to ensure their meaningful participation and sense of ownership. The team diligently addressed potential tensions, working to maintain social cohesion throughout project implementation.

Flexibility and adaptability were crucial elements that contributed to the project's success. The team remained agile, continuously adjusting strategies in response to ever-evolving circumstances on the ground. By maintaining open lines of communication and embracing a collaborative mindset, the project team mitigated risks and seized opportunities as they arose.

Furthermore, capacity-building initiatives were implemented to provide training and employment opportunities for the local workforce. This not only contributed to skills development but also



economically empowered the local community. The project team trained the end users on how to use the new infrastructure and how to maintain it.

The project's achievements were profound, resulting in the construction of health and education facilities. These newly established facilities now serve as essential resources, providing much-needed services to the conflict-affected population. The project stands as a testament to the power of determination, strategic partnerships, and a people-centric approach in overcoming adversity and making a lasting positive impact on the lives of Afghan people.

## **5.2. Empowering communities: Lessons learned from Nigeria's shelter assistance project**

An emergency response project in Nigeria focused on addressing the urgent need for shelters and housing units for internally displaced persons (IDPs). The project employed a settlement-focused strategy to help in shelter repairs for affected households in conflict-affected areas. It involved rehabilitating community infrastructure, providing vocational training, and supporting livelihoods. The shelter aspect of the project specifically targeted households living in return areas with damaged houses. The project utilized a combination of in-kind distributions and cash-based transfers to provide assistance to these households. Each damaged house received a personalized scope of work, and technical supervision was provided during the self-rehabilitation process carried out by the beneficiaries (Global Shelter Cluster, 2019).

The project encountered a range of challenges, including significant security risks, land ownership disputes, limited resources, and complex social dynamics within the IDP population. However, the project team employed several best practices to overcome these obstacles and achieve successful outcomes.

A key strategy employed by the team was extensive consultation with local communities. By actively involving community members in decision-making processes and seeking their input on suitable housing locations, the project ensured that the solutions met the actual needs of the IDPs.

Through close collaboration with local government entities, the project team addressed Housing, Land, and Property (HLP) issues. This collaboration allowed for an understanding of the legal and regulatory frameworks surrounding land ownership and property rights in Nigeria. By actively engaging with relevant authorities, the project team navigated complex HLP challenges, ensuring that the construction of shelters and housing units for IDPs adhered to legal requirements and obtained necessary permissions and approvals. This collaborative approach helped mitigate potential disputes and ensure the project's compliance with local laws, further enhancing its success in providing safe and suitable housing solutions for the displaced population.

Recognizing the importance of sustainability and conflict sensitivity, the project incorporated design principles that aligned with the cultural and social requirements of the IDPs. This approach not only ensured the functionality and durability of the shelters but also contributed to the well-being of the displaced population.

Efficient stakeholder engagement, meticulous planning, and strong project management played crucial roles in the project's success. By actively involving all relevant stakeholders, including community members, local authorities, and implementing partners, the project created a sense of ownership and cooperation. This collaborative approach helped streamline processes and address challenges in a timely manner.

The project's efforts resulted in providing safe and dignified shelters for the displaced population. By addressing their immediate housing needs, the project contributed to their stability, well-being, and sense of dignity.

These case studies emphasize the critical importance of incorporating best practices and lessons learned in infrastructure delivery within conflict zones. Stakeholder engagement, conflict-sensitive approaches, flexibility, adaptability, and collaboration with local communities, government entities, and development partners are key elements for successful project implementation. By implementing these strategies, infrastructure projects can play a pivotal role in reconstructing and developing conflict zones, contributing to their long-term stability, resilience, and sustainable progress.

## **6. Conclusion: Advancing infrastructure delivery in conflict zones**

While managing projects in conflict zones presents numerous challenges, it also offers opportunities for innovation, collaboration, and making a meaningful difference in the lives of those affected by conflict. By embracing best practices, drawing on lessons learned, and continuously adapting to the evolving context, project managers can navigate these challenges and contribute to positive change.

Throughout this paper, we have explored various aspects of managing infrastructure projects in the complex environments, including understanding the challenges, strategic planning, risk management, adaptive approaches, stakeholder engagement, monitoring, and evaluation, building resilient teams and leadership, and lessons learned from case studies.

It is evident that infrastructure projects in conflict zones demand a full understanding of the local context, including social, political, and economic dynamics as well as conflict analysis. Adopting conflict-sensitive approaches and engaging local communities are essential for project success, ensuring that projects contribute positively to social cohesion and avoid exacerbating conflicts. Strategic planning, risk management, and adaptive approaches enable project managers to operate effectively in conflict zones by adjusting strategies as needed.

Stakeholder engagement and communication play a critical role in maintaining transparency, building trust, and ensuring project accountability. By involving local communities, project beneficiaries, and relevant stakeholders, project managers can harness local knowledge, empower communities, and promote ownership, leading to more sustainable and impactful projects.

Monitoring and evaluation are essential components of infrastructure delivery in conflict-affected environments. These processes enable project managers to track progress, assess project performance, and make decisions based on data-driven insights. By utilizing real-time data collection, participatory approaches, and a culture of learning and adaptation, project managers can enhance project outcomes and contribute to project resilience.

Building resilient teams and leadership is crucial in conflict environments where project teams face unique stressors and uncertainties. Strong leadership, clear communication, and creating a supportive and inclusive team culture are vital for navigating challenges and maintaining project momentum.

Risk management and adaptability are fundamental in conflict zones where operating conditions are constantly changing. Project managers must prioritize safety and security measures, implement contingency plans, and remain flexible to adjust project strategies as needed. Collaboration and partnerships with relevant stakeholders including local communities, government entities and development partners enhance project outcomes, promote resource sharing, and avoid duplication of efforts.

Drawing from case studies, we have seen successful infrastructure projects that have overcome challenges and delivered positive results in conflict zones. These projects have exemplified the importance of contextual understanding conflict-sensitive approaches, engagement with local communities, flexibility, and collaboration. By applying the lessons learned and best practices from these projects, project managers can further advance infrastructure delivery in conflict zones and contribute to sustainable development and stability in the region.

In conclusion, infrastructure delivery in conflict zones requires a multidimensional and adaptive approach. By understanding the challenges and implementing strategic planning, risk management, adaptive approaches, stakeholder engagement, prioritization, monitoring, and evaluation, we can deliver meaningful and impactful projects in complex environments.

## References

APM, 2022. *Managing Projects in Post-Conflict and Disaster Zones*, s.l.: Association for Project Management.

Balcik, B. et al., 2010. Coordination in humanitarian relief chains: Practices, challenges and opportunities. *International Journal of Production Economics*, 126(1), pp. 22-34.

Cox, M. & Thornton, N., 2010. *Managing Results in Conflict-Affected and Fragile States: A Stock Take of Lessons, Experience and Practice*, s.l.: Department for International Development.

Dawar, A. I. & Ferreira, M. F., 2021. New winners and losers in North Waziristan: Understanding tensions between top-down projects and local knowledge in the post-conflict setting (2015–2019). *Cogent Social Sciences*, pp. 1-20.

Earnest, J., 2019. Managing projects in war-torn societies: A case study from Kosovo principles, practices and challenges of “project management” in conflict zones. *Journal of Management History*.

Englund, R. L. & Bucero, A., 2019. *The Complete Project Manager: Integrating People, Organizational, and Technical Skills*. s.l.:Berrett-Koehler Publishers, Inc..

Gagnon, B., Leduc, R. & Savard, L., 2009. Sustainable Development in Engineering: A Review of Principles and Definition of a Conceptual Framework. *Environmental Engineering Science*, pp. 1459-1472.

Global Shelter Cluster, 2019. *Shelter Projects 2017–2018*, s.l.: s.n.

Hay, A. H., Karney, B. & Martyn, N., 2020. Reconstructing infrastructure for resilient essential services during and following protracted conflict: A conceptual framework. *International Review of the Red Cross*, pp. 1-29.

IIK, 2023. *Conflict Barometer 2022*, s.l.: Heidelberg Institute for International Conflict Research.

International Federation of Red Cross and Red Crescent Societies, 2016. *Applying Better Programming Initiative – Do No Harm*. s.l.:IFRC.

Jha, A. K. et al., 2010. *Safer Homes, Stronger Communities: A Handbook for Reconstructing After Natural Disasters*. s.l.:World Bank Publications.

Kivrak, S., Ross, A., Arslan, G. & Tuncan, M., 2009. Impacts of Cultural Differences on Project Success in Construction. *Association of Researchers in Construction Management, ARCOM 2009 - Proceedings of the 25th Annual Conference*.

Köster, K., 2010. *International Project Management*, s.l.: SAGE Publications Ltd.

Kujala, J. et al., 2022. Stakeholder Engagement: Past, Present, and Future. *Business & Society*.

Manas, J., 2006. *Napoleon on project management : timeless lessons in planning, execution, and leadership*. s.l.:Thomas Nelson.

Manley, A. D., 2009. *Security Manager's Guide to Disasters: Managing Through Emergencies, Violence, and Other Workplace Threats*. s.l.:CRC Press.

Mashatt, M., Long, M. G. D. & Crum, J., 2008. *Conflict-Sensitive Approach to Infrastructure Development*, s.l.: United States Institute of Peace.

Morris, P. W. G. & Pinto, J. K., 2004. *The Wiley Guide to Managing Projects*. s.l.:John Wiley & Sons, Inc.

Nguyen, L. D., Ogunlana, S. O. & Lan, D. T. X., 2004. Long Duy Nguyen, Stephen O. Ogunlana, Do Thi Xuan Lan. *Engineering, Construction and Architectural Management*, pp. 404-413.

Nieto-Rodriguez, A., 2021. *Harvard Business Review Project Management Handbook: How to Launch, Lead, and Sponsor Successful Projects*. s.l.:Harvard Business Press.

Pinto, J. K., 1996. *Power and Politics in Project Management*. s.l.:Project Management Institute Headquarters.

Project Management Institute, 2021. *A Guide to the Project Management Body of Knowledge, 7th edition*. s.l.:PMI.

Quigley, M., 2008. *Encyclopedia of Information Ethics and Security*. s.l.:Information Science Reference (an imprint of IGI Global).

Rolstadås, A., Hetland, P. W., Jergeas, G. F. & Westney, R. E., 2011. *Risk Navigation Strategies for Major Capital Projects*. s.l.:Springer London.

Silber, A., 2017. *Adaptive Project Management: Leading Complex and Uncertain Projects*. s.l.:Booklocker.com, Incorporated.

Smith, N. J., Merna, T. & Jobling, P., 2014. *Managing Risk in Construction Projects*. Third ed. s.l.:John Wiley & Sons, Ltd..

Tharp, J., 2012. *Project management and global sustainability*. s.l., Project Management Institute.

UNDSS, 2017. *United Nations Security Management System: Security Policy Manual*. s.l.:United Nations Department of Safety and Security.

United Nations High Commissioner for Refugees, 2023. *UNHCR Emergency Handbook (EHB)*. [Online]

Available at: <https://emergency.unhcr.org/protection/protection-principles/humanitarian-principles>

United States Agency for International Development, Afghanistan, 2012. *Construction of Health and Education Facilities (CHEF)*. [Online]

Available at: <https://2017-2020.usaid.gov/news-information/fact-sheets/construction-health-and-education-facilitieschef>

Wikipedia, 2023. *2023 Sudan conflict*. [Online]

Available at: [https://en.wikipedia.org/wiki/2023\\_Sudan\\_conflict](https://en.wikipedia.org/wiki/2023_Sudan_conflict)

World Bank, 2011. *World Development Report 2011: Conflict, Security, and Development*, s.l.: s.n.

## About the Author



### **Yamanta Raj Niroula**

Kathmandu, Nepal



**Yamanta Raj Niroula** is an experienced engineering and project management professional with over 15 years of experience in overseeing all phases of construction and infrastructure projects.

He managed engineering and infrastructure projects across eight countries, namely Nepal, Maldives, Singapore, Afghanistan, Philippines, Nigeria, Yemen, and Sudan. His portfolio includes the successful implementation of multiple infrastructure projects in conflict-affected areas of Afghanistan, Sudan, Nigeria, and Yemen. In these challenging locations, he worked with UN World Food Programme (WFP), International Organization for Migration (IOM) and Norwegian Refugee Council (NRC). His skill set includes contract and construction management, planning, scheduling, and project controls.

He holds a Master's degree in Rural Development and Bachelor's degree in Civil Engineering. He obtained the Project Management Professional (PMP) certification in January 2011. Currently based in Kathmandu, Nepal, he can be reached at [niroulayr@gmail.com](mailto:niroulayr@gmail.com).