UNITED NATIONS DEVELOPMENT PROGRAMME

UNDP GUIDANCE NOTE

Community infrastructure works in crisis settings

UNDP GUIDANCE NOTES FOR RECOVERY SOLUTIONS

- Building resilience through livelihoods and economic recovery
- Women's economic empowerment in crisis settings
- Community infrastructure works in crisis settings
- Private sector recovery and development in crisis and post-crisis settings

Photographs

Cover (left), page 7: A frontline mason helps earthquake recovery efforts in Nepal after receiving UNDP-supported training. *UNDP Yemen*
Cover (centre), page 11: Volunteers trained in first aid, rescue and rubble clearance in Haiti. *UNDP Haiti/Moliere Solon*
Cover (right), page 14: UNDP equipped COVID-19 isolation centers in Yemen with solar panels, so they function even with the chronic lack of electricity in the country. *UNDP Yemen*
Page 20: In Indonesia, reconstruction after the devastation of the 2014 tsunami. *OCHA/Anthony Burke*
Page 24: Rehabilitation of agricultural roads in Lebanon. *UNDP Lebanon*
Page 26: A community recovery project in the Democratic Republic of Congo. *UNDP DRC/Aude Rossignol*

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Acronyms and abbreviations

BOQ	Bill of Quantity
CB	Crisis Bureau
CO	Country Office
CPD	Country Programme Document
DIM	Direct Implementation Modality
Eurocode	European Community unified Building Code
HACT	Harmonized Approach to Cash Management
HBDA	Household and Building Damage Assessment
HQ	Headquarters
IBC	International Building Code
LPAC	Local Project Appraisal Committee
NIM	National Implementation Modality
OCHA	Office for Coordination of Humanitarian Affairs
PCAT	Partner Capacity Assessment Tool
PCNA	Post-Conflict Needs Assessment
PDNA	Post-Disaster Needs Assessment
PMP	Project Management Plan
POPP	Programme and Operations Policies and Procedures
PS&E	Plans, Specifications and Estimates
PSU	Procurement Services Unit

SES	UNDP Social and Environmental Standards
SOP	Standard Operations Procedure
SOW	Scope of Work
UNCT	United Nations Country Team
UNDAC	United Nations Disaster Assessment and Coordination
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNITAR	United Nations Institute for Training and Research
UNOSAT	UNITAR Operational Satellite Applications Programme
UNSDCF	United Nations Sustainable Development Cooperation Framework
UN	United Nations
WBS	Work breakdown structure

Introduction

A key component of the mission of the United Nations Development Programme (UNDP), especially in a crisis and fragility context, is adequate community infrastructure such as roads, bridges, irrigation canals, schools, health centers, housing, and markets as well as operating systems like debris management.

This paper, *Guidance note for community infrastructure works in crisis settings*, assists Country Office (CO) staff to plan, design and implement infrastructure projects that swiftly link governments and communities during crisis response to advance new or ongoing development efforts. The guidance covers assessment, construction, repair and reconstruction of essential community infrastructure. It focuses on the crisis response and transitional phases of infrastructure work. It connects the period of crisis response, centered around operations with United Nations Disaster Assessment and Coordination (UNDAC), to the recovery and subsequent development operations under the Public Sector Undertaking (PSU) Construction Works Policy.

A natural disaster or conflict presents a window of opportunity to implement long-term change through community infrastructure work that links governments and communities and to build local capacity for more resilient standards and practices.

These development opportunities also present challenges, due to the risks inherent in infrastructure work, especially in a crisis response situation. Projects often fail to meet budget, schedule, and sustainability goals. This document provides tools to identify and address key risks with appropriate administrative and technical systems.

Selection of and approach to specific community infrastructure for UNDP engagement is a strategic decision based on a broad review of the context of the crisis. The guidance discusses several other assets available to support a UNDP CO facing community infrastructure challenges in a crisis response.

1 Principles and applications

1.1 Guiding principles

1 **Public safety:** Consideration of public safety dictates use of qualified and certified building professionals throughout assessment, design, and construction. This should include consideration of all risks, whether related to the current crisis or independent of it.

2 **Community driven and owned:** Community infrastructure rehabilitation projects must be guided by the affected communities' participation throughout the assessment and implementation phases. Training and employment benefits, social cohesion and community solidarity are important benefits of participation.

3 **Climate and environment:** Design and implementation strategies should consider adaptation to changing climate conditions in the context of broad environmental assessment. Guidance is available from UNDP Climate Change Adaptation and Global Environment Facility.

4 **Gender and social inclusion:** Assessment, design and construction activities must be sensitive to possible inclusion/exclusion on the basis of age, gender, disability, type of livelihoods, ethnicity, caste or political affiliation. Teams should create opportunities to discuss and validate gender-based information during community consultations or organize focused group discussions to determine key issues and barriers that create gender inequalities and explore options for reducing gender gaps.

5 **Transparency:** Corruption hinders economic development, reduces social services, and diverts investment. The (UNDP) Programme and Operations Policies and Procedures (POPP) includes tools to increase transparency and decrease corruption.

6 **Livelihoods and basic services:** Infrastructure supporting livelihoods and provision of basic public services is a priority, especially in relocations.

7 **Alignment with Social and Environmental Standards (SES):** Within the context of operations in crisis and post-crisis settings, work shall comply with the goals of the UNDP SES. See links in Annex A.

8 **Strive to build back/forward better.**

1.2 Applications

Community infrastructure is defined here as the physical structures and systems that provide critical support for the lives and livelihoods of the population, as shown in Table 1. It includes buildings and bridges as well as localized water and energy systems. Community infrastructure is frequently damaged in disasters and conflicts and is also adversely affected by the climate crisis. Sustainable repair or construction is vital to socio-economic recovery and fosters local human development, security, and rights.

Debris management	Clearing roadways and drainage facilities provides access for relief workers and economic recovery. Public and private building debris management is the first step to recovery. Recycling is an important consideration when designing any debris management programme. See Annex C.
Housing	The planning for housing begins even as emergency shelter activities are underway. This includes public and individual housing. See Annex D.
Roads and bridges	Local roads, walkways and small pedestrian and road bridges provide physical, social and economic connectivity (access to markets and services) as well as to local and national road systems.
Water and sanitation	This encompasses drainage ditches, channels and drains, piped and boxed culverts, embankments, retaining and protection walls, small water reservoirs, ponds and earthen dams, river inlets and minor irrigations works, shallow wells, boreholes and pump houses and localized distribution systems, wastewater treatment systems, locally improvised waste disposal and composting plants.
Solid waste	Restoring municipal solid waste management systems is critical to health. This includes existing urban areas and locations with displaced persons.
Education and health	Educational and health facilities (often in remote areas or informal settlements). Work includes green power solutions, sustainable access to water, wastewater treatment, safe disposal of hazardous medical waste and telecommunications/internet access. Schools and hospitals may also serve as shelters.
Social and cultural	Locally run resource centers, childcare facilities, playgrounds, religious centers, graveyards, community centers, multi-purpose halls. Some types may also serve as shelters.
Energy	Off-grid community, public buildings and household-based energy generation and distribution systems, including solar mini-grids, bio-gas plants, bio-gasifiers, solar home systems for electrification, micro-hydro and community-driven low-cost technical plants.
Economic	Community and household level capital, such as the buildings, capital, assets and stocks within micro-enterprises and cottage industries (for example, crafts, agriculture, and fisheries) that produce goods and services. Local marketplaces including covered markets and community shops.
Information and communications technology (ICT)	Small ICT-based installations exist in some communities for internet, information, communication, and early warning messages. Includes community telephone/internet access points, local communication masts and other improvised communication devices.
Security	Police, justice and fire-fighting facilities, street lighting, civil protection facilities
Natural Systems	Repair of damage to natural systems and use of natural systems in the climate adaptation effort

Table 1. Typology of Community Infrastructure.

UNDP engagement varies according to the situation and over the duration of the recovery. Several factors may influence the focus of infrastructure engagement:

- Specifics of the crisis and resulting needs
- Prior and ongoing UNDP programme activities in country
- Government requests
- Capacities of UNDP and other agencies
- Requests by funding agencies

Debris management and housing are discussed in more detail in Annexes C and D in this version of guidance. Future versions of this guidance document may include detailed discussion of other segments listed above.

2 Programming and support resources

2.1 Resources

UNDP has developed sets of solutions to support Country Offices to assess, respond, and plan recovery in issues linked to infrastructure. Table 2. references several support mechanisms.

Guidance	Community infrastructure including assessment, debris management and housing
Advisory capacity at Global Policy Network (GPN)/HQ	Engineering advice
Infrastructure Campus	Portal connecting UNDP engineers and associated professionals
SURGE and ExpRes roster	Engineering and other advice and support within and outside UNDP
Assessments	Tools and methodologies to conduct assessments at the macro and micro-level

Table 2. Community infrastructure support resources.

2.2 Required skills

Infrastructure damage assessment and work generally require specific technical expertise in a range of civil, structural, electrical, construction engineering, and related fields to manage costs, schedules, and risks, and meet local legal requirements:

- Local and regional engineers with knowledge of local codes and practices, and appropriate geographic and technical professional registration
- Specialists in evolving technical areas such as climate adaptation and mitigation
- Infrastructure project delivery experts

See Annex B for additional information.

Engineering and related professionals may be available from:

- Existing CO staff
- Local and regional engineering associations
- Local and regional universities with engineering programmes
- Regional and HQ, especially through SURGE
- Other development/humanitarian organizations

2.3 Engineering standards, risk and climate change

Compliance with local and national codes and standards is the minimum basis for design. The project should investigate potential ongoing change in local codes with professional regulatory authorities, engineering associations and engineering universities. Other international codes (Eurocode, IBC, etc.) must also be applied when SES and other UNDP principles require more rigorous design for social, environmental and climate change reasons. The SES documentation has been revised at end of 2021 to include extensive guidance on climate change matters.

The government and cooperating agencies may have standard designs for specific infrastructure types—like schools and health facilities.

The Climate Change Knowledge Portal (CCKP) (https://climateknowledgeportal.worldbank.org) and other reference materials provide useful indications of the anticipated extent and uncertainty around climate change impacts. While CCKP provides guidance focused down to specific countries and major watersheds, the resulting guidance requires the designer to use professional judgement in selection of design criteria for individual site locations and infrastructure types.

3 Cross-cutting activities and work stage management

3.1 Community infrastructure roadmap

At UNDP, community infrastructure is typically an activity within a project undertaken to support or enable the provision of basis services, the restoration of the socio-economic situation and support community livelihoods. It can be a project within a programme or a subproject or series of subprojects within a larger project. Text box 1. contains some common industry definitions of a construction works project.

Most of UNDP's community infrastructure activities are driven by a crisis. Figure 1. illustrates the variety of scenarios project managers and engineers face:

- Project A (unchanged): the project continues without being impacted (unlikely)
- Project B (terminated): the crisis may change priorities and needs
- Project C (changed): the crisis highlights new needs
- Project D (started): a proposal is developed in response to the crisis to support recovery efforts and build back better
- Project E (started and completed): Rare because infrastructure normally takes longer than duration of formal crisis duration
- Project F (subsequent): projects are developed to meet on-going needs highlighted during the crisis.

Each come with many challenges including procurement strategies, finding qualified contractors, delivery of materials, remote monitoring, security concerns to name a few. All these issues and challenges must be addressed within the policy and procedures frameworks of UNDP, donor and country.

- A **programme** is made up of several smaller interdependent projects. Programmes are often managed by a team, with projects and tasks delegated across team members. Some functions involved in launching a successful programme might include outlining objectives, planning execution, managing operations, and reporting on status. Projects are bundled together into a programme when the benefits of managing the collective outweigh those of managing projects individually.

- A **project** is generally smaller and often comes with cost, date and resource constraints. Project goals are normally short-term, whereas programmes are focused on a company mission or goal.

- A **subproject** is a larger job divided into a series of smaller tasks. By dividing the work into smaller units, employees can be assigned to an aspect of the overall project for which they are suited. The smaller subprojects also prevent employee burnout.

- A **nested project** is part of a larger project that has been divided into discrete subprojects to facilitate faster delivery of specific work.

Text box 1. Useful project management definitions.

While this guidance note is focused on the crisis response period, it is important for those involved to understand the path construction works (community infrastructure) follow through to completion, allowing them to assess the damage and needs more effectively. Future guidance notes are planned to address engineering and project management of community infrastructure and the issues and challenges they face in more detail. However, all community infrastructure activities require a detailed Infrastructure Work Plan (commonly referred to as a Project Management Plan (PMP) in the engineering community) and a "roadmap" for completion within UNDP programmes and projects. Regardless of the terminology used, the work plans or PMP's should be broad enough to cover and communicate all essential information to deliver quality infrastructure that meets the needs of the communities and the goals of the overall project/programme cost-effectively and on schedule.

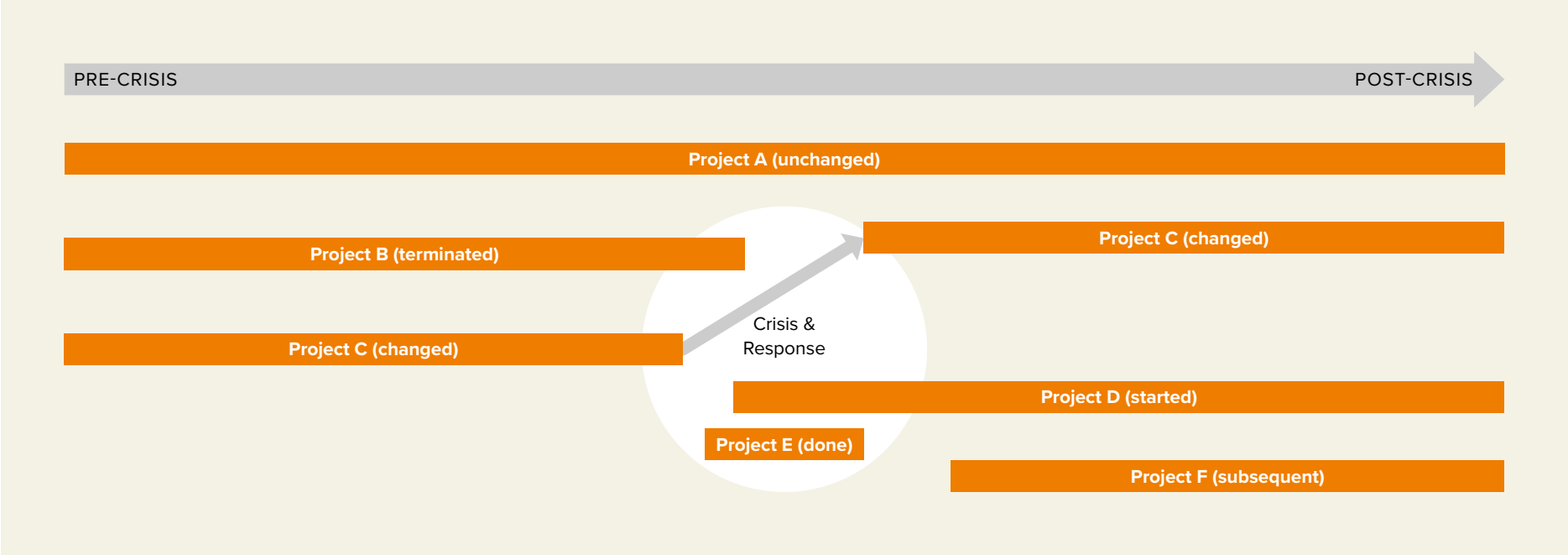


Figure 1. Infrastructure in a crisis context.

The flow chart or roadmap shown in Annex E visualizes the phases or steps in delivery of community infrastructure from inception to turnover. This chart provides only the top-level framework. Only key tasks are shown. This is envisaged as the starting point for an engineer/project manager responsible for the design and construction of infrastructure within the infrastructure activity of a program. Each community infrastructure activity will be unique and will require its own more detailed roadmap and sub charts or, in the case of an on-going effort, an updating and revision of the PMP and roadmap.

The roadmap is broken into project phases and a swim lane for each partner. First the proposal or pre-project phase (justifying, defining, assessment, conceptual plans and order of magnitude costs, and proposal), followed by the five phases typically found in project management literature with key activities shown in the responsible party's swim lane. Tasks or activities are in boxes, and decision and approval points are in red.

3.2 The five project phases

1 **Initiation:** feasibility study, risk analysis, and environmental and social impact assessments. Equivalent to 15 per cent of Plans, Specifications and Estimates (PS&E).

2 **Planning:** scoping, scheduling, level of quality and standards (equivalent to 30 per cent of PS&E), budget, work breakdown structure.

3 **Executing:** infrastructure team review of project management plan, final PS&E, approved construction contract documents.

4 **Managing (controlling):** monitoring progress and making necessary changes.

5 **Closing:** project reviews, audits and lessons learned.

At UNDP, the development of proposals and the initiation of a community infrastructure project typically occur during a crisis response. They transition to the recovery phase for planning, executing, managing, and closing.

The roadmap can be time sequenced, but it is not a schedule. Who does what can depend on whether a direct implementation modality (DIM) or national implementation modality (NIM) is employed. The choice of modality will likely not be determined during a crisis response (see Annex E).

Working from left to right on the roadmap, projects originate from within UNDP, a national government, or a donor in response to a crisis, disaster or as part of an ongoing stabilization or development programme. Ideas are assessed for alignment with national priorities, analyzed and then turned into a proposal.

3.3 Construction works policy

Upon authorization of a proposal by the Regional Bureau, a Project Preparation Plan is prepared. In addition, an infrastructure team should be established if the project involves community infrastructure. Regardless of whether it is a

stand-alone infrastructure project or a subproject, this is when projects begin and follow a typical project cycle through to completion and turn over.

During initiation, a development team completes the assessment of our implementing partner by completing a Harmonized Approach to Cash Management (HACT) assessment. The team uses the Partner Capacity Assessment Tool (PCAT). For construction works projects, technical studies include a feasibility study, risk analysis, and environmental and social impact assessment. They are completed and a project document is drafted. A project document template and instructions/checklist are available from https://popp.undp.org/UNDP_POPP_DOCUMENT_LIBRARY/Public/PPM_Formulate%20Programmes%20and%20Projects_Project%20Document%20Template.doc. The Local Project Appraisal Committee (LPAC) is convened, and a project board chaired by the government is established.

For a construction works project, a project engineer (engineer manager) is assigned, and an infrastructure team established and chartered. The infrastructure team coordinates the required social, environmental and technical studies. They establish an engineering management process documented by an Infrastructure Work Plan/PMP.

Preparation of a Design Basis (DB) is recommended. This terminology is not common at UNDP but is a common term in the construction industry. It is a document that is prepared in collaboration with stakeholders and users describing the needs and proposed use of the proposed community infrastructure to guides the development of plans, specifications, bill of quantities, and estimates by the infrastructure team. The DB ensures the needs identified in the project document will be addressed and the physical environment and community context are understood by the infrastructure team, the scope and quality of construction works are defined, and the expectations of the national government (client) are confirmed.

A works project requires four distinct areas of expertise:

1. Project management to ensure that all the programme and operational requirements are articulated and the project management mechanisms (including work planning, monitoring, risk management and oversight) are in place.
2. Engineering management to addresses the technical requirements and assure quality.
3. Procurement management of the solicitation process in accordance with UNDP procurement policy to ensure that applicable contract terms and conditions mitigate risks to UNDP.
4. Contract management in the day-to-day management of the works contracts during the implementation stage.

Text box 2. Four areas of expertise required for a project.

The project engineer leads the preparation of the initial PS&E to approximately 15 per cent level of completion. These are used to prepare terms of reference

for the hiring (including the negotiation of the scope of services) of an engineer or architect firm. In the case of DIM modality, the architect or engineer is retained for the full development of the complete set of PS&E or in the case of design-build contract review and monitor the design development. Under a NIM modality the PS&E may be prepared or procured by the government. Under NIM, the engineering design/Bill of Quantity (BOQ)/Scope of Work (SOW) should be reviewed and certified by UNDP engineers and UNDP may offer technical support to the government.

During the planning phase, project management is worked out. The PMP is a collection of documents communicating essential information about the project to everyone involved. It provides marching orders for the team. Topics covered include:

- Project scope definition
- Work breakdown structure (WBS)
- Social and environmental issues
- Project resources (money, people, equipment)
- Legal conditions (land use permission/ownership, the government's permission, construction/safety regulation)
- Schedule with milestones
- Budget
- Procurement strategy
- Quality management plan
- Risk and Change management plan
- Project closure

During the planning phase, the PS&E should be taken to 30 per cent.

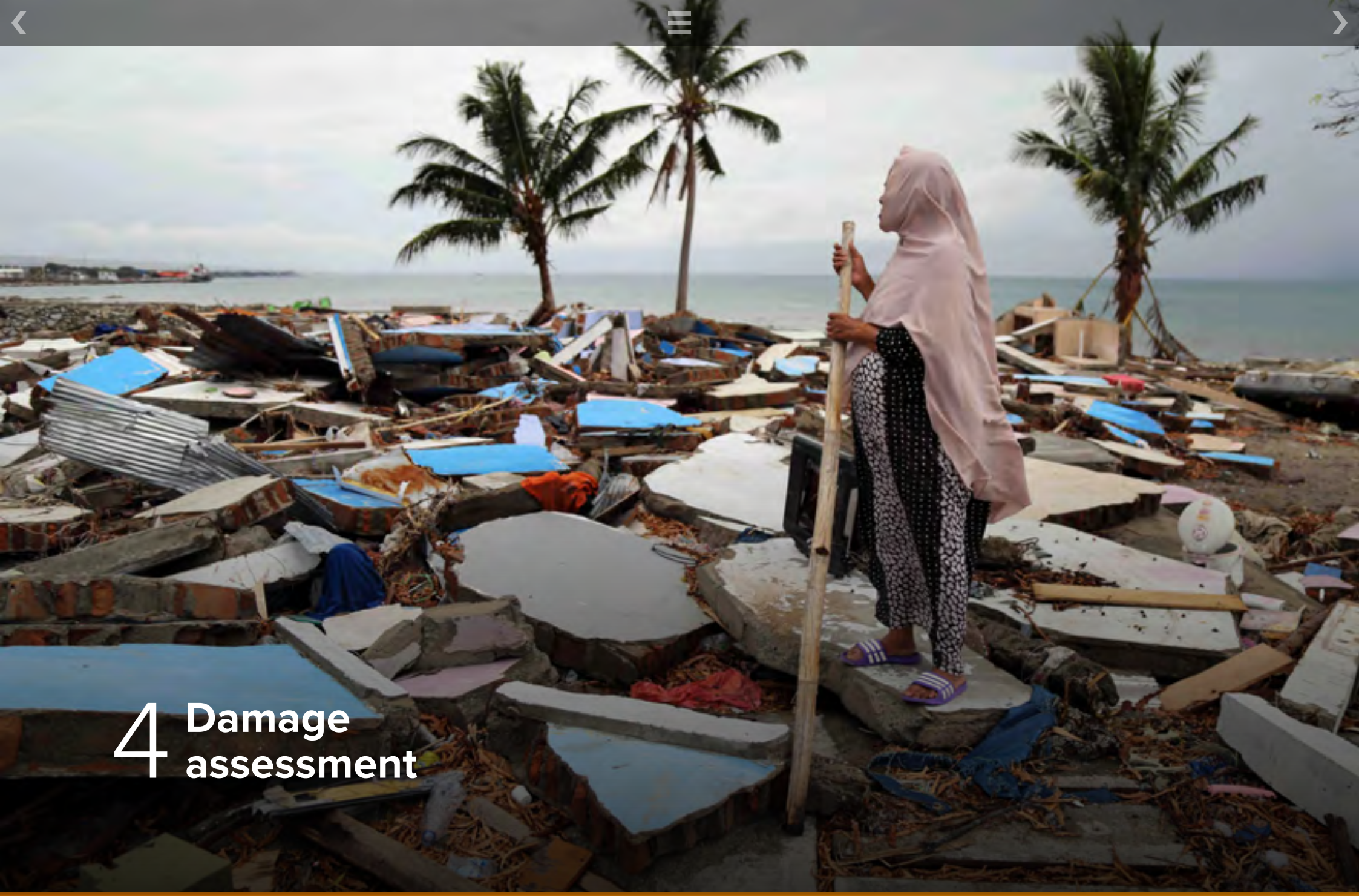
In the execution phase, the project manager or project engineer reviews the PMP with the project team. The project team then executes the tasks described in all the plans, processes and procedures summarized and referenced in the PMP and the completion of PS&E. The team must identify and consider the project risks and uncertainties. Some risks are controllable, others not.

- Discuss how controllable risks will be avoided or managed.
- Review assumptions and validate reasonableness.
- Be prepared to manage change.
- Consider preparing contingency plans.

The monitoring phase involves tracking, reviewing and regulating the progress and performance of the project, identifying any areas where the plan needs to be changed, and making the changes.

Finally, project closure provides a unique opportunity for the project manager to capture and distribute the experience, skills and knowledge developed during the project to accomplish the following tasks:

- Complete a final accounting of the project budget.
- Create "Project Punch list" of outstanding items.
- Prepare the final project report and include objective evaluation of the project's success, outlining the project accomplishments, important project data—good or bad—and major project changes and their impact.
- Provide a final accounting and explain variances.
- Provide recommendations for future projects.



4 Damage assessment

In terms of infrastructure, the initial phase following a disaster is focused on assessment of the damage and the potential UNDP short- and long-term role in the response. Active UNDP engagement in the assessment allows prudent planning, but care should be taken to not prematurely commit to specific recovery projects.

In the wake of a major disaster, the government may call for a large-scale multisectoral needs assessment. For example, an initial analysis might use historical data and remote sensing in a Global Rapid Post-Disaster Damage Estimation (GRADE). A more detailed effort might be a Post-Disaster Needs Assessment (PDNA), or, in post-conflict settings, a Post-Conflict Needs Assessment (PCNA). Information from such an assessment can serve to elaborate the situation analysis. However, fully detailed information arising from an exercise like the PDNA requires time. More detailed damage information on building infrastructure may require a Household and Building Damage Assessment (HBDA).

Overall operations across the entire damage assessment may be led by any of the following entities:

- Government
- Regional disaster agency (like CDEMA in the Caribbean)
- OCHA (or delegate)
- International NGOs and think-tanks (such as REACH/Impact Initiatives)

Issue	Questions
Ensure inclusion of community infrastructure in assessments and housing	Ensure that community infrastructure damage and losses feature in the design of needs assessments and that this responsibility is assigned to a dedicated expert in the assessment team. The assessment should document impact on community infrastructure, even if only to obtain rough estimates. Quantitative and qualitative information can be gathered through interviews with local government, key informants, focus group discussions and field observation.
Coordinate and harmonize	In an environment of over-stretched capacities, it is important to coordinate the needs assessment with other development and humanitarian partners to avoid duplication of effort or gaps. Close coordination with those assessing sectors such as livelihoods, agriculture, education, water and sanitation, telecommunications, and health is necessary to cross-reference data and findings. Early establishment of web-enabled collaborative workspaces are useful as conduits of information exchange and storage among team members and key stakeholders.
Use local knowledge and expertise	Despite the need to set up community infrastructure rehabilitation interventions with urgency, the quality of the assessment often hinges on local sources of knowledge, including local professionals, authorities, and communities. In particular, the participation of knowledgeable local engineers and builders who are conversant with locally used technologies and construction methods is strongly recommended to support the technical assessment. Verification can be conducted through direct consultation with the affected population.

Table 3. Basic recommendations for needs assessments.

Individual areas of infrastructure damage assessment (such as housing and public infrastructure) are then assigned to a specific agency to lead. Basic recommendations for the design and conduct of needs assessments are provided in the table below. Since the post-disaster approach places special emphasis on community engagement in all aspects of community infrastructure renewal, Table 3. elaborates some of the key assessment planning considerations.

Issue	Questions
Consider cause of damage and vulnerability to multi-hazard risk	Infrastructure should be considered in context of prior condition, local building practices and building codes. Consideration should be given to risks different from the specific event and to the potential of changing risks, such as with climate change.
Use satellite imagery, aerial photography, Light Detection and Ranging (LIDAR), drones and geographic information systems	Satellite-based information and geospatial technology should be used during the first few days of a disaster. These can provide an effective visual overview of the extent of damage. The UN UNOSAT are available to support disaster-affected countries with satellite-based information to help facilitate the planning and management of the emergency response and recovery programme. Google Earth is another useful application. Geo-referencing tools (like KOBO Toolbox) allow data sharing across organizations in a manner critical to ongoing infrastructure works.
Conduct a familiarization tour and a sampling strategy	A transect walk, or familiarization tour, through the affected community helps to gain a first-hand understanding of the natural resources, the livelihoods base, the extent of damage to community infrastructure and its consequences. The sample set of communities surveyed should be selected to cover as many categories as possible of infrastructure damage in a range of community types. Experienced engineers should be included and directed to identify the root cause of the damage. This may include many factors including poor materials, design or codes.
Engage women, youth and the most vulnerable	Consultation with local stakeholders helps craft an approach that includes women, youth and the poorest and most vulnerable. This is critical to the UNDP approach. The transect walk represents an opportunity to discuss the impact of the damage with communities.
Engage governmental authorities	Close collaboration with the government from the very beginning of the process is critical. It is the government that typically leads or requests the assessment to take place, authorizes the enumerator teams to access certain areas and communities, provides any necessary support along the way, and utilizes the assessment findings to inform their recovery plans.
Distinguish public from private community assets	Is the infrastructure publicly or privately owned? This is a key distinction. Private infrastructure (housing and some commercial facilities) projects must be carefully selected and written permission from the owner is required to remove, enhance or reconstruct.

Table 3. Basic recommendations for needs assessments. (Continued)

The damage assessment must identify the geographic area of impacts, damage to infrastructure assets and the general level of damage and inform a response strategy while collaborating with other organizations and (prominently) the government.

Supplementary infrastructure damage needs assessments are often required at the community level to identify the most appropriate schemes for the project. Critical infrastructure may need a phased approach in which temporary repairs are made to restore function while determining the result.

Engineering studies are needed to itemize the equipment, materials, and labour required for each infrastructure scheme. A technical investigation on the structural vulnerability of damaged community infrastructure is unlikely to be within the parameters of any immediate assessment.

For this reason, a visual or structural investigation of damaged community infrastructure is conducted as part of a supplementary or follow-up engineering assessment. Such investigations should be appropriately documented and supported where possible by either photographic or video records. They must link to the geo-referencing available through tools like KoBo Toolbox or ArcGIS Survey123.

Straightforward visual inspections, carried out by a qualified engineer and accompanied by community representatives, often suffices to determine the structural condition. Such inspections include:

- An analysis of the context of the asset and the damage that has occurred: the detailed structural damage, for example, cracking, corrosion, discoloration, judgment of the construction, material, and quality. Determination of the root cause of the damage and how the asset can be repaired or reconstructed resiliently.
- Based upon the results of the analysis the intervention can be identified. This may include reconstruction, rehabilitation, or the safe demolition of the remaining infrastructure.
- The scope of the infrastructure project is defined including design layout, technical configuration, structural system, dimensions, geometry of elements, spacing, loading systems and so on. Ensure the infrastructure will be fully functional upon the completion of the project. For example, a health care facility has diminished value if it does not have sustainable access to electricity, water and sanitation.

5 From assessment to works initiation

The situation analysis identifies urgent recovery needs. The rationale for UNDP assistance with community infrastructure is set out alongside its comparative advantages and fits within a more comprehensive early recovery and development framework. One section should be dedicated to the strategic business case for UNDP engagement as part of the Country Programme Document (CPD), United Nations Sustainable Development Cooperation Framework (UNSDCF), or as a member of the United Nations Country Team (UNCT). A review of primary and secondary data, reports of trusted third-party organizations, government statistics or other relevant local survey information should all be part of the situation analysis.

The programme strategy should briefly outline the main aims of community infrastructure, including its purpose within the early recovery framework. It should identify the root cause of the damage and how Building Forward Better will mitigate future risks. It should summarize the overarching outcome of the project and how each output will contribute to the outcome. It should detail how the project will work, how it will help build national and local capacities, and how it will be integrated within national plans and priorities. It should refer to other UN and UNDP projects, how it complements them and how it incorporates cross-cutting issues.

Community infrastructure rehabilitation also links directly to the UNDP portfolios for strengthened governance capacity, environmental sustainability, gender issues and poverty reduction outcomes. Therefore, all UNDP CO programme units must be engaged in programme planning and implementation, and the process coordinated with other partners through, for example, a UNDP-led cluster for specific early recovery issues.

6 Lessons learned

Public engagement is critical

Public engagement is as important in post-crisis infrastructure work as in other situations, but the chaos and stress on the public at such a time complicate the process. Face-to-face, written, and digital contact including all sections of the community can build a better understanding of challenges and inform the public of UNDP engagement. Prominent members of the community often dominate public engagement to the exclusion of others, thus masking needs around issues like gender and groups like children.

Communities should drive design

Community-centred design starts with the needs of the community, emphasizes the importance of diverse perspectives, and encourages solution seeking among multiple actors.

Infrastructure design drives (or limits) project success

A technically sound design and implementation process is required to support project objectives, and to manage risks, costs, and schedules.

Teamwork and collaboration are critical to an effective crisis response

Post-crisis situations often lead to multiple organizations, including UNDP, interacting, and cooperating in ways that are new, at least in the affected country. Active and flexible engagement with OCHA and other coordinating mechanisms improves the effectiveness of UNDP and the entire crisis response.

Local markets matter

Existing local markets for labour and building materials and local building customs are starting points for “Build Back Better”.

Technical detail is key in damage assessments

Community infrastructure is often relatively simple in design and function. Still, care should be taken that broad technical issues (like pre-existing conditions or changing environments) receive sufficient attention by qualified engineers so UNDP can plan sustainable (Build Forward Better) solutions.

Beware of fraud and corruption

The disruption in social and economic process around a crisis generally increases the risk of fraud and corruption. Infrastructure projects in these situations attract organizations with inadequate or inappropriate solutions to infrastructure challenges. The urgency of the response challenges the implementation of UNDP standard practices. Transparency is the key. See individual technical discussion in this document as well as Annex A for a link to PSU/POPP guidance on the appropriate processes to control fraud and corruption in the crisis response context.

Transition to recovery and development operations

Early assessment work is likely to lead to immediate work (like debris management) within the crisis response. It also sets the stage to prepare project concepts to be carried out during the subsequent early recovery phase, using project development tools in the project roadmap and in normal POPP works guidelines. An early step in the transition will often be hiring or assigning an engineer to write the terms of reference fit for the situation. The context of crisis also adds emphasis to the need to assess budget availability, manage community and donor expectations and use risk management and appropriate contingency during work in a dynamic situation.

Annex A. Links

For access to range of resources through SURGE	SURGE: https://intranet.undp.org/unit/cru/rrsg/SURGETOOLKIT/SitePages/ImmediateCrisisResponseSOP.aspx
Construction works administrative information through General Procurement Services Unit resources through POPP	POPP Construction Works: https://popp.undp.org/SitePages/POPPSubject.aspx?SBJID=487&Menu=BusinessUnit
Crisis response information through POPP	POPP Crisis Response: https://popp.undp.org/SitePages/POPPBSUnit.aspx?TermID=158d9cf4-4e8a-4f7d-8485-d74e7b72b494&Menu=BusinessUnit
General anti-fraud policies	POPP Fraud Policy: https://popp.undp.org/SitePages/POPPSubject.aspx?SBJID=384
Human-centred design resource	Acumen Academy: https://acumenacademy.org
Example engineering code of practice (from Canada)	Climate Change Adaptation for Engineers (Canadian): https://engineerscanada.ca/sites/default/files/01_national_guideline_climate_change_adaptation.pdf
UNDP Social and Environmental Standards (SES)	Toolkit: https://info.undp.org/sites/bpps/ses_toolkit/Pages/Homepage.aspx Standards: https://www.undp.org/accountability/social-and-environmental-responsibility/social-and-environmental-standards
UNDP SES S2 Climate Change and Disaster Risk GN Standard 2 Interim Version	UNDP SES: https://info.undp.org/sites/bpps/SES_Toolkit/SES%20Document%20Library/Uploaded%20October%202016/UNDP%20SES%20S2%20Climate%20Change%20and%20Disaster%20Risk%20GN%20Standard%202_INTERIM%20VERSION_31%20August2021.pdf
International engineering code of practice	The Code of Practice on Principles of Climate Change Adaptation for Engineers: https://www.wfeo.org/code-of-practice-on-principles-of-climate-change-adaptation-for-engineers/

Annex B. Technical skills and terms of reference

Engineering specialty	Project type
Civil engineer—structural	Buildings, housing, bridges, and other structures
Civil engineer—environmental	Debris, waste management, water, and wastewater, air pollution
Civil engineer—hydrology and hydraulics	Flooding, storm surge, water, irrigation, dam and reservoir
Agricultural engineer	Irrigation, product processing
Electrical engineer	Solar, other power generation and micro-grids, electrical machinery, telecommunications, control systems
Other	

In some cases, these people would be on the ground and able to directly assess, inspect and supervise works. In other cases, they may be able to provide remote assistance and advice. Experience in the region or in similar social, economic, and disrupted environments is important. Professional registration and experience with disaster recovery and response with international engagement is important in all leadership positions.

These technical people may be available from a number of sources including staff in the country, hired locally through the private sector, professional associations or universities after event, or provided through the SURGE mechanisms through HQ. Combination of technical and language skills is a critical selection criterion.

Annex C. Debris management

Summary: Step-by-step checklist

- Set up an efficient and qualified project team
- Assess estimated debris quantity
- Assess local supply (materials and equipment)
- Determine scope and area for the intervention
- Determine the potential to reuse/recycle debris
- Work in strong partnership with national and local authorities and communities
- Assess needs: internal technical capacity gaps, implementing partners TORs and vetting, institutional support
- Establish coordination structures
- Decide on short- and long-term implementation strategy through the private sector, universities, UN agencies, NGOs and or community-based organizations
- Establish monitoring and evaluation systems

Seven ways to speed up delivery

1 Quick start the programme using cash for work schemes for debris collection in public areas via an existing or temporary disposal site. Meanwhile, the project can launch a request for a proposal for site preparation or implementing partners.

2 If human resources are not available in the office, request SURGE support for the debris project manager and debris project specialist. A procurement or finance assistant, an engineer and a community liaison officer and reporting officer are also essential from the beginning.

3 Channel resources through one basket fund, if possible, and set up the debris project in Atlas with few project IDs to enable easy budget revisions. Involving HQ for all administrative steps for signing donor agreements with harmonized reporting cycles can save a lot of time.

4 Use the fast-track procedures for procurement and recruitment.

5 Don’t reinvent the wheel. Refer to the ready-to-download templates, TORs, and examples on the intranet site.

6 Set up a coordination structure with the government to ensure its leadership.

7 Put accountability/reporting mechanisms in place from the beginning.

Ten lessons learned

1 Parallel activities

Although a debris management plan can take several months to adopt, start fast with some quick wins such as the clearing of public areas like streets and public buildings. Prioritize the demolition of highly unstable structures that threaten public safety. These could start immediately after the disaster has hit. During this stage, also assess, map and plan additional interventions.

2 Building damage assessments soon after the disaster

This should be led by government institutions, which often require technical support. Assessment of affected structures will identify buildings that pose a risk to the population and identify temporary measures to prevent further damage. The assessment can provide crucial information in terms of volume of debris, to inform planning as well as resource mobilization.

3 Partnerships to deal with hazardous materials and demolition

Partnerships with specialized experts are essential for handling hazardous materials, as well as ensuring engineering capacity for demolition. Masonry structures over one story tall and other structures over two stories or of complex construction are likely to require engineering assistance for safe demolition.

4 National and community-level strategies

Strong collaboration with national and local authorities is essential, but they may be overwhelmed after a crisis. As debris management is the entry point for many recovery activities, a community-led strategy can simultaneously be put in place, working directly with communities to find appropriate solutions and integrate their views and needs.

5 Personal belongings

A communications strategy is important, as citizens will see the debris of private houses as their personal property. Ensure that women are part of the communications strategy and their voices are heard. Personal belongings remain within the debris and therefore it is important to establish guidelines for how to access and/or demolish private properties. Also, it is important to record the beneficiaries who refuse access to avoid future problems.

Use of emergency employment/cash for work immediately post-crisis and cash for production in the short to medium term has proven very effective.

Nevertheless, cash for work interventions should not last for extended periods since they might disrupt local markets.

Start with a procurement strategy: Sometimes, equipment and materials stock at local providers might not be enough. Prioritize local vendors whenever possible. Bear in mind that if you decide to import equipment and materials, you should account for processing time at customs.

6 Legal frameworks, health, and safety

Social benefits, contract modalities and other benefits such as health, safety and environmental issues become liabilities for UNDP if they are not properly addressed. A group health insurance scheme for workers is recommended. Make sure the cash for work modality is under the existing legal framework and labour regulations.

7 Heavy equipment

Debris management operations imply the use of heavy equipment such as bulldozers and trucks that often have a negative impact on road conditions. Debris projects should integrate a road maintenance/repair component to ensure that the negative impact is mitigated when possible.

8 Demolition and rebuilding

Ensure links between debris management operations and the Shelter Cluster. Many owners of unsafe buildings will not allow the demolition of their premises without a guarantee of shelter.

9 Transport routes

Debris management operations must take traffic constraints and transportation time into account. Alternative routes to avoid residential areas and night transportation could be considered to reduce the burden on daytime traffic and inconvenience for the population.

10 Signed consent for demolition

Some tenants might not have the legal capacity to authorize demolition. Make sure the person authorizing the works is legally authorized to do so.

Overview

Natural disasters and conflicts often generate huge volumes of debris. Destruction of houses and public infrastructure due to a flood, earthquake or conflict can contribute to insecurity, displacement of populations, and the interruption of public services. Clearing away debris is a critical part of relief and recovery efforts. This work usually begins once search and rescue operations have ended. Experience shows that slow debris clearing can seriously hamper economic and social recovery.

When UNDP undertakes early debris removal, it is usually part of a multi-track strategy that paves the way for the restoration of government capacity for public service delivery or community-based livelihoods recovery. UNDP can engage in medium-term debris management activities where debris is seen as a resource and can be used for reconstruction and recovery of community infrastructure, such as houses, public buildings, and river embankments. Debris management also has an environmental aspect, not only because of the presence of potential hazardous and/or toxic waste but because debris can block access, obstruct drainage or waterways, and prevent solid waste collection. This can increase public health risks. Training provided for this task helps people gain the skills necessary to become involved in reconstruction efforts.

Strengthening government ownership and capacity is an essential component of support to debris removal, as it engages disaster waste management, environment management, planning and legal dimensions.

Health and safety

Debris clearance, storage and recycling involve health and safety hazards for workers. Debris management operations should take steps to ensure that workers and bystanders are not at risk.

These include:

- Following local health and safety regulations. If there are none, the environmental, health and safety guidelines (EHS guidelines) of the IFC (https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=nPtguVM) can be used as a reference.
- Providing workers with proper tools, water and safety equipment such as dust suppression tools, breathing apparatus, noise/vibration reduction mechanisms, and so on.
- Using transportation routes that avoid residential areas and use one-way traffic systems.
- Making first aid kits available on-site at all times.
- Using standard operating procedures for the disposal of hazardous materials.
- Removing unexploded ordnance before debris clearance starts.

This paper complements the other guidance notes in the Livelihoods series, especially ‘Emergency Employment Creation and Enterprise Recovery’.

The planning phase

Programme strategy

UNDP's support to debris management and recycling is usually part of a wider recovery framework that most likely goes beyond debris removal. The approach favours labour-intensive and community-driven debris removal strategies that provide employment to the local population, especially the poorest households. In terms of debris management, UNDP's most common approach is a community approach with small disposal sites and temporary storage sites. The sorting of the debris should take place as much as possible at the demolition site itself to avoid incurring high transportation costs. From smaller sites, debris is then sent to final processing or disposal sites/landfills. The community approach is beneficial because the volume of unrecyclable waste is minimized and the reuse of recovered materials is maximized on-site, close to the market that demands recycled materials.

Experience has shown that most material collected is recyclable or reusable. Recyclers can crush rubble and convert it into sub-base material for roads and other non-structural purposes. UNDP's support initially starts with the clearance of main roads and public spaces, often through emergency employment work schemes such as cash for work in the early stages of the disaster, and then moves on to the demolition and clearance of damaged private property, which require a needs assessment of the zones and the collection of demolition permits.

Assessment of debris

In order to determine the appropriate implementation strategy for debris management, a rapid assessment should determine:

Issue	Key Question	Purpose
Gain understanding of the legal situation in the country	Who will be legally responsible for debris management? Who will be the final owner of the collected rubble and recycled material? What are the laws or regulations for waste and debris handling? What permits exist? Who issues the permits (mayor or ministry)? What is the process for abandoned houses for which no owner can be found?	Update or establish criteria and procedures for debris management; and consider any waiver of the current laws and regulations.

Issue	Key Question	Purpose
Rapid and detailed projection of debris quantity and quality (types)	What is the estimated total quantity or volume of rubble? How many houses/public buildings have been destroyed or damaged? What are some key characteristics of the geographical areas where debris is to be removed (including security)? Are there any hazardous or poisonous materials such as uranium, white phosphorus, asbestos, mines, or other unexploded ordnance? How to deal with corpses (if any) under the rubble? What is the expected timeframe needed for debris removal? Are there risks associated with multi-storey buildings that need to be demolished? Which buildings have priority?	Determine different strategies for rubble and hazardous waste collection and recycling; assess each structure and determine a baseline for the quantity of debris; estimate the length of time that rubble removal will take. Review government priorities and find out what happens to areas left out of the prioritization process.
State of public infrastructure, including landfills and dumping sites	Are there landfills? What is the capacity? Are there access roads to the affected areas, and to a dump site? Is security infrastructure intact? Specific disposal sites for hazardous waste?	Determine the feasibility of central storage areas or various staging areas, and transportation routes to/from the major affected areas.
Capacity for removal, sorting and recycling	Are NGOs/UN agencies with rubble removal experience present? Are loaders and crushers available? Are there local private contractors with experience? Which type/location of debris should be handled first? Which temporary facilities are needed? Environmental impact assessments for debris disposal sites? Are there official debris recycling criteria for construction materials?	Determine implementation modalities.

Different crisis situations generate different debris. For example, flooding events generate larger amounts of household waste. Conflict-related debris have the risk of accidents from unexploded ordnance.

Local engineers and building contractors can help provide an accurate estimate of the quantity and volume, as they may have estimates of quantities per type and size of buildings.

Results framework

Outputs	Indicators	Indicative activities
Safe removal and reuse of debris	• Quantity of rubble removed • Quantity of recycled or reused debris • Number of houses demolished • Number of removed unexploded ordnance • Quantity of removed hazardous materials (asbestos, heavy metals, etc.) • Number of community infrastructure sites rehabilitated with products made out of debris (e.g. pavement stones)	• Delineate and prioritize affected geographic areas. • Remove and transport rubble to operating site. • Ensure landfill/recycling site meets environmental standards, with government approval. • Develop guidelines for site management • Assessment and mapping of unexploded ordnance. • Assess the structural integrity of buildings and develop guidelines for demolition. • Craft a communication strategy to inform the public on the safe removal and reuse of debris. • Set health and safety standards for workers. • Community planning to identify infrastructure projects for which products made of debris can be used.
Economic revitalization	• Number of short-term emergency jobs created (men and women) • Number of men and women trained in debris recycling and enterprise management • Number of micro-enterprises created in the removal and recycling of debris	• Develop guidelines for labour-intensive debris collection and recycling. • Undertake environmental assessment for safe use/reuse and disposal of debris. • Develop livelihoods projects in affected zones, in particular viable recycling business start-ups or projects in solid waste management. • Work with members of the community to rehabilitate community infrastructure.
Institutional strengthening	• Improved coordination and information management by government • Policy framework on debris; and number of trained staff: men and women.	• Support nationally owned debris management plans. • Support the government in organizing roundtable discussions with stakeholders on debris assessment, material testing and management.

Monitoring and evaluation

In order to systematically monitor the progress of the debris management project, you need clear outputs and outcome indicators. Specific monitoring tools for debris projects could include:

- A baseline in order to understand monitoring and evaluation data.
- Monitoring systems at the storage or staging site, such as verification vouchers via a ticketing system to ensure dump trucks or roll-off containers handling debris bring materials to an approved location and do not unload in unauthorized places. For large debris management operations, a paperless debris tracking system is highly recommended through use of smart phones to provide real-time information and data.
- Mapping of debris clearance activities, coupled with a geographical information management system that details the debris removed, recycled, and reused.
- Consider establishing community-based structures for monitoring; alternatively, hire an independent NGO for monitoring where community-based monitoring has its limitations.

Project implementation/Phases of debris management

Main components of the phases of debris management

Activity	Check list of key considerations
Determine the area of intervention	• Map ongoing/planned debris removal initiatives. • Ensure women are part of the process and their voices are heard. Set up complementary support (like childcare) so women can actively participate. • Liaise with authorities and coordinate with partners. • Determine the feasibility of longer-term engagement. • Classify structures.
Participant selection	• Explore the best partners to select participants. Whenever possible, this should be a decision of the community, who are always in a better position to identify members that are most in need. • One person per family per phase. • Make sure the process is known by everyone in public gatherings whenever possible. Transparency helps build up trust and reduces the likelihood of gender-based violence.

Activity	Check list of key considerations
Removal of debris	• Cash for work/cash for production, government, or contractors. • Selection of sites—for conflict situations, demolition sites and access/transport routes cleared of explosives prior to demolition. • Demolition of damaged buildings. • Removal of human remains. • Identify recyclable material (steel etc.). • Approval process from government for collecting and transporting the rubble. • Need for legal documents such as the right to access private property. • Definition of a transportation programme.
Staging, sorting and storage sites	• Identify, assess, and select potential temporary storage/dumping sites, long-term landfills and hazardous waste options. • Assess environmental impact of all sites. • Develop operations and disposal site guidelines for the sorting and treatment of rubble. • Determine safety measures.
Recycling and reuse	• Determine the potential for recycling/reuse of materials. • Establish technical requirements for the purchase or hire of crushers.
Exit plan	• Develop an exit strategy for temporary storage and recycling sites. • UNDP's debris management project could transition to existing solid waste management.

Annex D. Housing

Summary: Step-by-step checklist

- Formalize agreements with national or local institutions.
- Set up an efficient and qualified project team.
- Assess estimated housing repair and reconstruction needs using the Household and Building Damage Assessment (HBDA).
- Determine scope and area for the intervention.
- Determine how to document property ownership.
- Work in strong partnership with national and local authorities, financial institutions, and communities.
- Assess the need for institutional support for permitting, inspection and housing guidelines.
- Establish coordination structures.
- Decide on short- and long-term implementation strategy through the private sector, UN agencies, NGOs and/or community-based organizations.
- Establish monitoring and evaluation systems.

Seven ways to speed up delivery

1 Quick start the programme by revising or developing a housing guideline that provides practical guidance for homeowners and local builders on how to resiliently rebuild and repair homes.

2 Consider establishing mobile Technical Assistance Centres (TACs) to service the areas with the most impact. TACs can be provide technical advice on individual home repair/reconstruction activities while also introducing the housing guideline.

3 If human resources are not available in the office, request SURGE support for the housing project manager and housing project specialist. A procurement or finance assistant, an engineer, a community liaison officer and reporting officer from the start of the project are also essential.

4 Conduct a Household and Building Damage Assessment (HBDA) and set up a coordination structure with the government to ensure its leadership.

5 Use the fast-track procedures for procurement and recruitment. Channel resources through one basket fund, if possible.

6 Don't reinvent the wheel. Refer to the ready-to-download templates, TORs, and examples on the intranet site.

7 Put accountability/reporting mechanisms in place from the beginning.

Lessons learned

1 Conduct activities in parallel

Although a housing reconstruction/repair plan can take several months to adopt and years to implement, start quickly with some fast wins such as improving a housing guideline that provides practical guidance for homeowners and local builders on how to resiliently rebuild and repair homes. Prioritize the root causes of the housing damage such as materials, design, and inspection. This could start immediately after the disaster has hit, as some homeowners will begin reconstruction or repairs within days. During this stage, also assess, map and plan additional interventions.

2 Household and Building Damage Assessments should begin immediately after the disaster

This should be led by government institutions, which often require technical support. Assessment of affected structures will identify buildings that pose a risk to the population and identify temporary measures to prevent further damage. The assessment can provide crucial information in terms of number of homes owned by the most vulnerable that need to be reconstructed or repaired.

3 Technical Assistance Centres provide timely assistance

Mobile TACs can serve heavily impacted areas by providing immediate and specific repair and reconstruction advice to homeowners. The work is best done in tandem with the housing guideline and usually includes the local housing authority, supported by additional engineering/architectural resources.

4 Public outreach

Working with the government, banks, and suppliers, establish a public outreach programme to complement mobile TACs' work to distribute information on Build Forward Better. Many homeowners will begin to repair their homes on their own, are anxious to Build Forward Better, and are looking for information they can trust. Houses that are repaired or replaced by the humanitarian community are often a small portion of the total effort, so getting information in the hands of homeowners is essential to meet the overall goal of Build Forward Better.

5 National and community level strategies

Strong collaboration with national and local housing authorities is essential, but they may be overwhelmed after a crisis. Local engineers and architects can provide additional resources for planning, permitting, design and inspection.

Local public universities have also been an excellent source of technical resources that can be deployed rapidly.

6 Property ownership and insurance

Documenting home ownership and insurance can be difficult in many situations. Funders are reluctant to fund housing work if clear ownership cannot be established. If clear title to homes is identified as a barrier, consider special legislation that can use local government to document ownership through assessor plats or other similar mechanisms.

7 Assess local technical and construction capacity

This will also provide a network of local engineers, architects, builders, and materials suppliers to help inform the response strategy. Reach out to local financial institutions to determine housing loan practices.

8 Define occupancy requirements early

Work with the national and local housing authorities to determine the requirements for occupancy. These includes water, sanitation, and electrical services. Also determine when homes must be reconstructed or if they will be allowed to be repaired, even if they do not meet code.

9 Provide solutions to those who are in unsafe housing

Ensure that families that can no longer occupy their residences are referred to safe shelter. Occupants will be reluctant to leave dangerous homes if they do not have alternative shelter. Ensure links between debris management operations and the Shelter cluster. Many owners of unsafe buildings will not allow the demolition of their premises without a guarantee that housing will be built.

10 Include women in the process

In many instances, women are the leaders in change, and have a willingness to Build Forward Better. Ensure women are included in the housing decisions. Separate women focus groups may be needed to ensure that women are comfortable to speak.

11 Carefully consider transitional housing

In many cases, transitional housing solutions such as smaller, provisional housing turn into long-term solutions due to a lack of permanent housing resources. Transitional homes should be designed to provide the minimum safe space for the family for the long term. Consider transitional housing built on the homeowner's original lot that can be easily scalable when additional resources are available.

Overview

Damages and losses to the housing sector can result in the highest costs of recovery from natural disasters and conflicts when compared to other sectors. Since homes are typically privately owned, they pose special challenges. Destruction of houses and personal property can contribute to insecurity and displacement of populations. The timely repair and reconstruction of homes is a critical part of relief and recovery efforts. This work usually commences once search and rescue operations have ended but planning and mobilization of resources should occur immediately after the event. Experience shows that a slow process can seriously hamper economic and social recovery and can contribute to political instability.

When UNDP undertakes housing activities, it is most often part of a multiple phased strategy that includes assessments, housing guidelines, technical advice, and reconstructing and repairing homes. Strengthening government ownership and capacity is an essential component of the support to housing reconstruction and repair, as it engages planning, property title, permitting and inspection for future housing activities.

The planning phase

Programme strategy

A housing strategy with a phased approach is recommended. The first phase begins immediately after the event and includes assessment, evaluation and updating codes or guidelines, and provides technical assistance for those who have resources to ensure reconstruction efforts are resilient.

The second phase identifies the most vulnerable for assistance in repairing or reconstructing their homes. The following options can be considered individually or in some combination.

Strategy	Advantages	Disadvantages
Use a large contractor to build many homes	• Fastest way to build many homes • Usually the lowest cost • Easiest to administer with the contractor responsible for quality, permitting and inspection	• Few options for owners • Seldom results in an increase in local capacity
Use several local builders to build homes	• Provides for individual preferences • Builds local capacity	• Tends to take more time than a large contractor • Requires added capacity to issue building permits and inspections

Strategy	Advantages	Disadvantages
Provide materials and technical assistance	• Lowest investment • Provides for the maximum individual style	• Slowest response option • Requires a high level of investment to ensure quality through plan reviews, issuing of permits and detailed inspections

The final phase strengthens the government's housing authority through proper planning/zoning, permitting and inspection procedures. This may require additional legislation to establish and enforce policies. Sustainable financial resources may also be necessary to sustain the programme.

Household and Building Damage Assessment

In order to determine the appropriate implementation strategy for housing, a Household and Building Damage Assessment (HBDA) is recommended. Kobo Toolbox is typically used for this assessment. Kobo is a digital data collection tool with the following characteristics:

- Open-source technology
- Used in challenging field environments
- Fast, reliable, and flexible

The HBDA will inform the housing strategy and recovery efforts by answering the following questions:

Root cause and multi hazard risk identification	What was the root cause of the damage and loss? • Building in a high-risk location • Changing climate conditions • Poor design • Poor materials • Poor construction/inspection/supervision • Inexperience	Update or establish a housing guideline to guide homeowners and builders on how to rebuild resiliently Support improved codes and enforcement
Safety of occupants	Is the home currently safe to occupy?	Identify alternative housing or shelters

Property ownership	Who is the owner of the home, and do they have proper documentation?	Determine if an assessor's plat or other method of documenting ownership is needed
Insurance	Is the home insured and to what level?	Helps determine what other resources are available to the homeowner
Identifying the most vulnerable	Identify those who are vulnerable: ● Physically impacted by the event ● Have had their livelihoods impacted ● Single female heads of household ● Elderly	Determine implementation modalities to assist the most vulnerable in the community

Different crisis situations generate different housing challenges. For example, flooding and volcanic events may require the relocation of homes out of high-risk areas.

	Indicators	Indicative activities
Housing guidelines	● Housing guideline updated or developed ● Number of housing guidelines distributed ● Number of builders certified	● Builder education workshops ● Homeowner education meetings
Technical assistance	● Number of homes visited, and advice given ● Number of home building permits approved ● Number of home construction inspections completed	● Visit homes and provide advice on repair strategy/reconstruction. Provide a log for each site visit ● Review and approval of building permits. If permit applications are deficient, provide advice on needed revisions ● Inspections completed during construction
Reconstruction/repair of houses	● Number of homes repaired ● Number of homes reconstructed	● Number of final occupancy permits issued for homes repaired ● Number of final occupancy permits issued for reconstructed homes

	Indicators	Indicative activities
Institutional strengthening	• Improved planning to avoid high risk areas when building • Strengthen building permitting and inspection process • Policy framework on housing; and number of trained staff: men and women	• Support nationally owned planning efforts • Support the government in organizing building permit and inspection programme • Training programme conducted and number of men and women trained

Local engineers and building contractors can help provide typical building design, construction methods, costs and permitting requirements.

Results framework

The following is an example housing framework to consider.

	Indicators	Indicative activities
Housing guidelines	• Housing guideline updated or developed • Number of housing guidelines distributed • Number of builders certified	• Builder education workshops • Homeowner education meetings
Technical assistance	• Number of homes visited, and advice given • Number of home building permits approved • Number of home construction inspections completed	• Visit homes and provide advice on repair strategy/reconstruction. • Provide a log for each site visit • Review and approval of building permits. If permit applications are deficient, provide advice on needed revisions • Inspections completed during construction

	Indicators	Indicative activities
Reconstruction/repair of houses	• Number of homes repaired • Number of homes reconstructed	• Number of final occupancy permits issued for homes repaired • Number of final occupancy permits issued for reconstructed homes
Institutional strengthening	• Improved planning to avoid high risk areas when building • Strengthen building permitting and inspection process • Policy framework on housing; and number of trained staff: men and women	• Support nationally owned planning efforts • Support the government in organizing building permit and inspection programme • Training programme conducted and number of men and women trained

Monitoring and evaluation

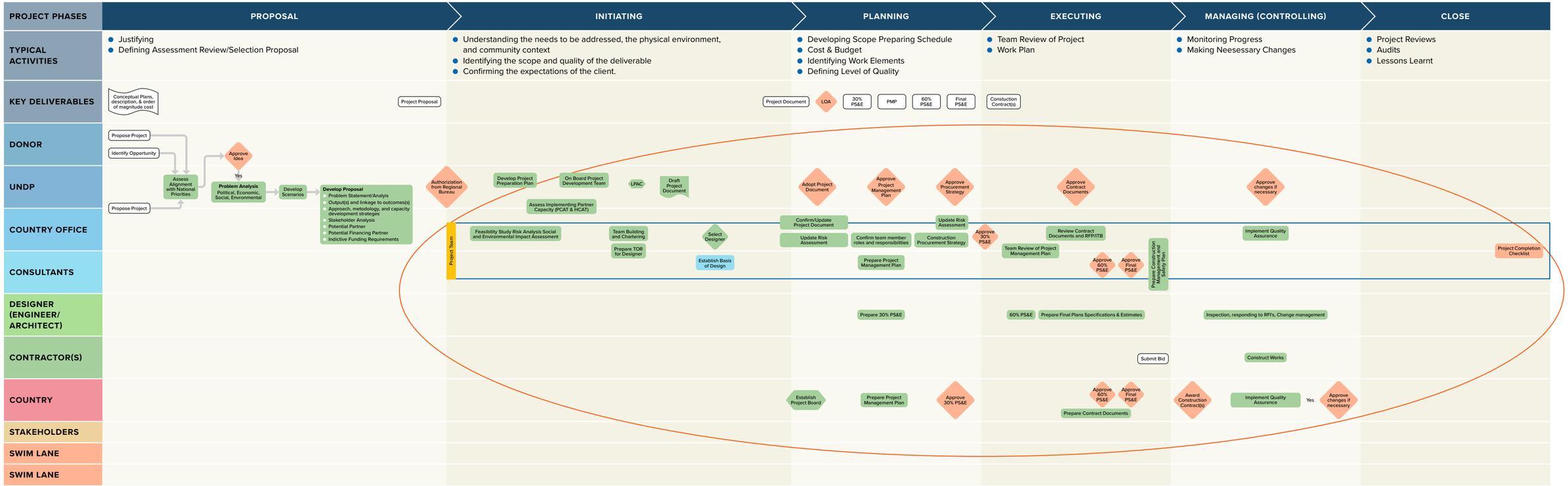
In order to systematically monitor a housing project, establish outputs and outcome indicators. Specific monitoring tools for housing projects could include:

- A baseline using the HBDA to understand monitoring and evaluation data.
- Monitoring building supply stores to determine if appropriate materials are being offered and sold.
- Mapping of homes completed/repaired based upon final occupancy permits issued.

Consider establishing community-based structures for monitoring, or alternatively hire an independent NGO for monitoring where community-based monitoring has its limitations.

Annex E. Roadmap

Infrastructure work phase



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