SYSTEMATIZATION OF THE DEBRIS MANAGEMENT PROGRAMME UNDP HAITI 2010 - 2012

DEBRIS MANAGEMENT: THE DOOR TO DEVELOPMENT
The United Nations Development Programme (UNDP) CO Haiti, Recovery, Livelihoods, and Poverty Reduction Unit, produced this document as part of the efforts to share knowledge and practical experiences on Debris Management after the earthquake of January 2010. With financial assistance of the Haitian Reconstruction Fund, the consultants Natalia Gomez de Travesedo and Olga Robles were supported by the following UNDP staff members: Afke Bootsman, Paola Soldà, Rita Sciarra, Jean Marie Duval, James Gabriel Iralien, Bob Beauplan, Shermere Deniser, Sherly Serene, Kerlande Eliecin Previna, Ahmad Kassem, Salmi Losley, Luckner Registre, Madeline Joseph Oakes, Ugo Blancos and Laura Shendi. The elaboration of the document also counted on the support of colleagues from ILO, UN-Habitat and UNOPS.

This publication is also the result of the collaboration of the Regional Service Centre for Latin America and the Caribbean through its Knowledge Management and Crisis Prevention and Recovery areas with the support of the following: Pablo Ruiz, Geraldine Becchi, Jairo Matallana and Paula Istúriz.

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ACRONYMS AND ABBREVIATIONS

CARMEN
Centres d'Appui pour la Réparation des Maisons Endommagées (Community Resource Centers for House Repairs)

CFP
Cash for Production

CFW
Cash for Work

CIAT
Comité Interministériel d'Aménagement du Territoire (Interministerial Committee for Land Planning)

CNIGS
Centre National d’Informations Géo-Spatiale (National Centre for Geo-Spatial Information)

DM-WG
Debris Management - Working Group

FAU
Fondation Architectes de l’Urgence (Emergency Architects Foundation)

IHSI
Institut Haïtien de Statistique et d’Informatique (Haitian Institute of Statistics and Information)

ILO
International Labor Organization

LI
Labor-Intensive

MTPTC
Ministère des Travaux Publics, Transports et Communications (Ministry of Public Works, Transport and Communications)

NGO
Non Governmental Organisation

PARDIN

UN
United Nations

UN-Habitat
United Nations Human Settlements Programme

UNDP
United Nations Development Programme

UNOPS
United Nations Office for Projects Service

WFP
World Food Programme

WG
Working Group
INTRODUCTION

On January 12, 2010, an earthquake measuring 7.0 on the Richter scale struck Haiti and devastated the capital Port-au-Prince, and its peripheral municipalities (Delmas, Cite Soleil, Croix des Bouquets, Petionville, Tabarre, Carrefoul), the Ouest department and the cities of Léogâne, Grand Goâve, Petit Goâve, Ganthier, Gressier, as well as the Sud-Est department and, in particular, the city of Jacmel. The earthquake killed more than 220,000 people and displaced more than 1.5 million people.

The building damage assessment, conducted between March 2010 and February 2011 by the Government of Haiti and the United Nations system, showed that more than 400,000 buildings were damaged or destroyed, of which approximately 218,000 could be occupied without repairs (green category), 105,000 were damaged but could be repaired (yellow category), and 80,000 were severely damaged and remained uninhabitable (red category).

The destruction of buildings and infrastructure generated a huge amount of debris, estimated at 10 million cubic meters, blocking streets and land in affected areas. In the absence of a national debris management strategy, debris could, thus, be cleared and disposed of in an uncontrolled manner, hindering relief, recovery and reconstruction activities.

Following the earthquake, the UN Integrated Strategic Framework (ISF) replaced the United Nations Development Assistance Framework, and defined strategic priorities for intervention in the country. The framework was adopted by all United Nations agencies and the United Nations Nations Mission for Stabilization in Haiti (MINUSTAH), to contribute to the Action Plan for National Recovery and Development of Haiti (PARDN) developed by the Haitian Government, in consultation with all sectors of the country.

The priorities of the Action Plan aimed to address the immediate emergency, resume economic, governmental and social activities, reduce the country’s vulnerability to natural disasters and re-launch Haiti on the path of development. Clearing the debris, demolishing potentially hazardous buildings and repairing damaged houses became the main means of encouraging the return and resettlement of displaced people to their areas of origin, the resumption of the productive cycle, the reconstruction of everyday life and the psychosocial recovery of affected populations. As such, debris management was one of the first steps towards rebuilding the country.

With this overarching objective, in February 2010, the United Nations Development Programme (UNDP) launched a joint labor-intensive Cash for Work programme (LI/CFW) in partnership with the World Food Programme (WFP) and the Government of Haiti, to initiate early interventions for debris and waste removal, clearing of roads and public squares, and dredging of drainage channels. Debris management thus became a strategic point of entry into damaged areas through programmes that stimulated the local economy and job creation, becoming the basis for sustainable development.

Debris management should not be viewed as a set of mechanical cleaning actions, but rather as an open door to encourage the rebuilding of the social fabric, promote job creation and initiate the sustainable development of affected populations.

Therefore, this systematization accounts for the human development process undertaken by debris management projects implemented in Haiti.
Conditions determined by physical, social, economic or environmental factors or processes increase the susceptibility of a community to the impact of hazards. United Nations - International Strategy for Disaster Reduction.
The extent of the damage caused by a disaster in an urban area is directly related to structural (socio-economic, socio-cultural, technical and institutional) and economic vulnerabilities. Often responsible for the magnitude of the disaster, these vulnerabilities slow recovery and hinder reconstruction and development efforts.

In Haiti, the generation of debris is directly related to this context:

- Rapid urbanization and population growth have propelled the development of vulnerable neighborhoods (slums) in the most exposed areas.
- The lack of urban planning and land insecurity prompted the uncontrolled construction of precarious housing that did not meet basic planning and safety standards.
- The illegal and informal occupation of land encouraged irregular construction methods - often based on the model of progressive construction, i.e., adding a floor after another without ensuring proper foundations -, with poor quality materials and the use of inappropriate construction techniques. Non-compliance or lack of building standards and building maintenance are one of the main causes for the collapse of houses and buildings, generating a huge amount of debris in the streets and lots of Haitian cities.
- The adoption of construction models that are more responsive and resistant to most recurrent natural hazards, such as hurricanes, heavy rains, winds or tornadoes, generated serious vulnerabilities compared to other latent but less predictable hazards such as earthquakes.
- The type, magnitude and location of the hazard are also directly linked to the extent of the damage.

In Haiti, the large migration from rural to urban areas observed since 1986 had harmful consequences on the housing of thousands of low-income families, leading to a high-density population settlement in the metropolitan areas and slums of Port-au-Prince, where marginal constructions were erected on informal, unfit and at high risk spaces.

Hurricane Hazel, which struck Haiti in 1954, caused a rapid change in the traditional building techniques of the country. Wooden houses and light buildings, more resilient and less dangerous against earthquakes but more hazardous in the face of hurricanes, were replaced by concrete houses and buildings that became death traps for thousands of people during the January 2010 earthquake.
In Haiti, the return of families to their neighborhoods of origin was one of the main priorities of the government and a central aspect of its post-earthquake action plan. The UN Integrated Strategic Framework, developed to support the government, contributed to the definition and implementation of a comprehensive debris management strategy, based on participatory approaches and the engagement of communities, considering debris management as an entry point at the neighborhood level as well as a resource for reconstruction programmes.
2.1 THE PROGRAMME

It can take several months for a debris management programme to be properly defined in a crisis situation. Consequently, the programme must generally be formulated and planned based on assumptions and preliminary values or data to be reviewed and readjusted as the information evolves.

UNDP began to implement a massive debris removal programme in the immediate aftermath of the earthquake, with the goal of cleaning the streets and main roads of the affected areas and promoting labor-intensive work under the Cash for Work modality to inject rapid economic resources into neighborhoods and promote their economic and social revival.

Subsequently, the implementation of successive pilot projects (Debris Léogâne, Debris I and Debris II), allowed for the progressive application of an integrated approach to debris management, including new aspects such as the revitalization the local economy through the creation of labor-intensive jobs under Cash for Production schemes and the promotion of micro and small enterprises, debris reuse and recycling, disaster risk reduction, among others, as the required information became available and the population and authorities developed the means to cope with the new demands.

The Debris I and Debris II projects in Port-au-Prince, benefited from the strategic integration of the UN system, with the involvement of several agencies including UNDP, ILO and UN-Habitat. A multidisciplinary and complementary design resulting from the participation of various agencies enabled the definition of roles and procedures of each partner, from the outset even prior to undertaking joint programming in more detail.

These programmes were developed in partnership with the Ministry of Public Works, Transport and Communications (MTPTC) and the target municipality, and had the operational support of national and international NGOs with longstanding experience in Haiti.

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<table>
<thead>
<tr>
<th>Implementation period</th>
<th>LÉOGÂNE</th>
<th>DEBRIS I</th>
<th>DEBRIS II</th>
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<tbody>
<tr>
<td>Budget</td>
<td>USD 11 million</td>
<td>USD 16.9 million</td>
<td>USD 25 million</td>
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<tr>
<td>Volume of debris cleared</td>
<td>300 000 m³</td>
<td>162 000 m³</td>
<td>625 000 m³</td>
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<tr>
<td>Key Partners</td>
<td>MTPTC</td>
<td>City of Léogâne, Community-based organizations and national and international NGOs.</td>
<td>MTPTC, Port-au-Prince Mayor’s office, City of Pétionville Mayor’s office, UNDP, UN-HABITAT, ILO, UNOPS, Community-based organizations and national and international NGOs.</td>
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UNDP in Haiti combined a holistic and long-term approach to debris management that goes beyond the immediate removal of debris and cleaning programmes. For UNDP, debris management was the key point of departure to undertake the sustainable recovery of neighborhoods, encourage early return and resettlement of displaced persons within their area of origin and begin the return to everyday life.

UNDP focused its debris management efforts on maximizing the benefits that may be derived from debris reuse and recycling, reducing the volume of debris for final disposal, and making debris a resource for job creation and raw material for the rebuilding process.

In this context, UNDP addressed the life cycle of debris management in Haiti, through the following phases:

1) Planning
2) Demolition and removal
3) Transportation
4) Reuse, recycling (macro and micro) and final disposal of non-recyclable debris

To the extent possible, UNDP supported manual demolition, focusing on stimulating the local economy, creating new individual and family revenue, and promoting financial flows at the neighborhood level, to the detriment of technological approaches that may be more efficient in terms of time and costs. Thus, the human dimension remained at the heart of its intervention.

This approach proved suitable because of Port-au-Prince’s uneven terrain and limited road access in slums - which made the use of heavy machinery almost impossible - and due to the abundance of an underemployed local workforce in need of generating income.

UNDP initiated the controlled management of debris focusing, first, on the options for reuse and recycling “in situ”, to reduce the final disposal volumes, promote economic activity within neighborhoods and encourage the reuse of materials in local redevelopment programmes. Simultaneously, a component of large-scale recycling was implemented in order to use debris as raw material to support major reconstruction programmes.

LESSONS LEARNED AND RECOMMENDATIONS

1. While the humanitarian world has confronted a fair number of disasters in urban areas, the lack of systematization and capitalization of experiences has created a vacuum in terms of references and valuable experiences for all humanitarian organizations. The implementation of a debris management programme should therefore be based on assumptions and should be undertaken as a continuous learning process in order to implement the best practices of previous projects to improve the planning of new ones. Experience will allow the project to be adapted to actual circumstances.

2. In order to respond to a key concern of the affected populations, the design of return support programmes must prioritize the creation of income-generating activities for residents of neighborhoods across the “Cash for Work” or “Cash for Production” modalities, the latter proving more effective in the demolition, removal and transportation of debris.
Table 2. The phases of debris management of the Haiti joint programme

**PLANNING**
- Central and decentralized government.
- UN system (UNDP-UN-Habitat-ILS - National and international cooperation organizations).
- Private sector.
- Scientific entities.
- Communities.

**DEMOLITION AND REMOVAL**
- Central and decentralized government.
- UN system (UNDP - UNOPS).
- NGOs.
- Communities.

**TRANSPORTATION**
- Ministry of Public Works, Transport and Communications (MIMPCT).
- UN system (UNDP - UNOPS).
- Private sector.
- Association of local transport and logistics companies.

**REUSE, RECYCLING AND FINAL DISPOSAL**
- Ministry of Public Works, Transport and Communications (MIMPCT).
- UN system (UNDP - UNOPS).
- NGOs.
- Communities.
- Small and medium-sized businesses.

**PLANNING**
- Establishment of a multidisciplinary and multi-agency team.
- Assessment of damage, definition of official volume and location of debris to be cleared.
- Definition of recycling potential of debris.
- Identification of landfill and treatment sites.
- Identification of transport routes to use and alternative transport.
- Definition of requirements in terms of machinery and labor (labor-intensive methods).
- Organization of the massive cleanup programmes.
- Organization / Definition of joint comprehensive debris management programmes.
- Linkage with reconstruction and development phases.

**DEMOLITION AND REMOVAL**
- Technical assessment of the structural condition of the houses and public and private buildings.
- Definition of legal and administrative procedures for demolition.
- Classification and distribution in intervention areas.
- Community outreach.
- Community planning.
- Obtaining of demolition permits.
- Technical planning of works (engines).
- Retrieval of demolition crews and necessary equipment.
- Demolition and removal of debris.

**TRANSPORTATION**
- Selection of main roads and communication routes for the transportation of debris to landfill/treatment sites.
- Selection of suppliers.
- Selection of transportation periods.
- Selection of payment mechanisms (per m3).
- Identification and development of payment mechanisms for debris discharge and treatment sites (in situ/on site).
- Feasibility studies and identification of debris recycling related economic sectors to develop.
- Community awareness and planning.
- Selection of beneficiaries (local micro entrepreneurs, collectors, sorters, etc.).
- Implementation of training workshops.
- Workshop equipment.
- Training of trainers.
- Technical and management training.
- Development of a marketing strategy (product marketing).

**REUSE, RECYCLING AND FINAL DISPOSAL**
- Strategic Framework (UN system - Government).
- Coordination mechanisms (sectoral tables, Immediate Recovery Cluster, DM-WG).
- Participation of local and national groups in lay-out and follow-up.
- Engineers (assessments, technical planning and monitoring of projects).
- Tracking system to ensure regular record of the number of houses demolished, the volume of debris cleared and people engaged.
- Steering Committees (programme monitoring and adaptation).

**PLANNING**
- Minimising and distributing debris.
- Technical assessment of the structural condition of the houses and public and private buildings.
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- Classification and distribution in intervention areas.
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- Community planning.
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- Tracking system to ensure regular record of the number of houses demolished, the volume of debris transported and disposed.

**TRANSPORTATION**
- Operational and legal framework.
- Li-cash for production schemes.
- Community platforms (community participation and consultation).
- Liaison Officers (local coordination of actions, conflict prevention).
- Software for data management and other applications (mapping, GIS).

**REUSE, RECYCLING AND FINAL DISPOSAL**
- Market study.
- Alliances and partnerships with companies and organisations for the allocation of trucks.
- Control and monitoring mechanisms (tracking system, GPS and photograpics) to ensure a record of the volume of debris transported and disposed.
- Steering Committees (programme monitoring and adaptation).

**PLANNING**
- Innovation of recycled products to facilitate their sale.
- System for monitoring and recording data on the innovation of recycled products to facilitate their sale.
- Establishment of a space for recycling exchange between key producers and users of recycled materials.

**DEMOLITION AND REMOVAL**
- Assessment of debris management of the Haiti joint programme.

**TRANSPORTATION**
- Methodology and means.

**REUSE, RECYCLING AND FINAL DISPOSAL**
- Lesson learned and recommendations.

**METHODS AND MEANS**
- Software for data management and other applications (mapping, GIS).
- Community platforms (community participation and consultation).
- Alliances and partnerships with companies and organisations.
- Strategic Framework (UN system - Government).
- Coordination mechanisms (sectoral tables, Immediate Recovery Cluster, DM-WG).

**LESSONS LEARNED AND RECOMMENDATIONS**
1. - The recycling of debris from destroyed homes and buildings can be considered a very sensitive issue for part of the population. Therefore a level of acceptance and cultural dimension before deciding to reuse debris should be accounted for.

2. - A conducive political and legal environment is key to ensure the smooth and proper development of a debris management programme, which includes highly sensitive issues such as land rights, reuse and recycling of debris, that determine what can and what cannot be done. The legal requirements of the intervention deserve special consideration.
2.3 STRATEGIC PARTNERSHIPS

Partnerships are core aspects of UNDP's work to encourage development goals and ensure the expected outcomes of the programme. To this end, UNDP seeks to ensure a dynamic strategic collaboration with the government, UN agencies, international financial institutions, bilateral and multilateral organizations, civil society and the private sector.

In Haiti, UNDP prioritized bringing together all key stakeholders to begin a joint and converging process of reconstruction, through a participatory approach and partnership with central and local governments, the UN system, local and international NGOs, the private sector and, especially, the Haitian population.

At the external level...

Aimed at supporting national reconstruction efforts, the Immediate Recovery Cluster managed the strategic coordination of all the recovery efforts in Haiti. UNDP facilitated the work of the cluster, bringing together over 120 organizations, including national institutions, UN agencies, international and national NGOs, and the private sector. Given the importance and specificity of the various components of this cluster, different Working Groups (WG) were developed, such as debris management, green recovery, energy, and education.

More than 50 organizations participated in the Debris Management - Working Group (DM-WG), coordinated by UNDP.

1. **Success factors**
   - UNDP to assume a leading role at the partner level to obtain the necessary demolition permits.
   - Establishment of a clear agreement between the various actors involved in debris management.

2. **Key Challenges**
   - Identification of stakeholders in debris management and contribution to the effective coordination of efforts.
   - Absence of references from other intervention strategies in terms of debris management.
   - Lack of coordination by a government that was strongly affected by the earthquake.
   - Absence of references from other intervention strategies in terms of debris management.

Creation of partnerships in the planning phase

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**Creation of partnerships in the demolition and removal phase**

**Success factors**

- Implementation of the DM-WG at the early recovery cluster level.
- Establishment of joint procedures (Municipalities, MITFIC) for demolition permits.
- Official classification of risk houses and buildings likely to be demolished.

**Key Challenges**

- Lack of a National Debris Management Strategy.
- High level of uncertainty about the eventualities and characteristics.
- Absence of official statistics, baselines and cadastral information delaying planning and programme start-up.

**In partnership with the Ministry of Public Works, Transport and Communications (MITFIC)**

- The process of debris removal in neighborhoods, strengthened community ties, promoting community involvement in the rehabilitation and reconstruction phases.
- Partner with organizations with access to the necessary demolition and debris removal equipment.

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The community is generally best placed to identify its priority problems and needs. In Haiti, UNDP began its debris management programme from a community planning approach, understood as the involvement of the population in the development of its territory. The “participatory urban planning” component was implemented as part of the Joint Debris Management Programme by the United Nations Human Settlements Programme (UN-Habitat) and its partners Emergency Architects Foundation and Oxfam GB, in consultation with the Department of Urban Planning of the MTPTC.

1. - Coordination between the actors in major disasters - both the UN system, NGOs and the private sector - is key in order to avoid duplication, unmet needs and inconsistent practices. The establishment of coordination mechanisms such as “clusters” in the context of the United Nations humanitarian reform offers excellent opportunities for exchange and dialogue. However the complexity of the management of debris requires, by itself, a special working group within the Immediate Recovery Cluster to ensure an integrated and comprehensive approach by many stakeholders.

2. - The lack of experience, know-how or capacity of a partner are barriers that are difficult to overcome to achieve the smooth development and coordination of all project activities. It is imperative to define the eligibility and participation of partners in relation to their actual response capacity before considering their active participation in all aspects of debris management.

3. - At the internal level, the articulation and coordination of a joint programme by UN agencies can be delicate and difficult, since their actions respond more to each agency’s particular vision rather than to the implementation of a joint programme. The Resident Coordinator must therefore play a leading role to ensure the connectivity and synergy of actions.

4. - External programme coordination must be ensured by the establishment of a steering committee comprised of the various executing agencies, donors, implementing partners, national and local authorities, including community leaders and municipal authorities.

Similarly, UNDP enlisted the services of UNOPS to support the MTPTC in the technical assessment of houses and to support the joint debris management programme with demolition, removal, transportation and macro recycling activities.

The collaborative, coordinated and complementary approach at the UN agency level took into account the specific mandates, experiences and comparative advantages of each agency to provide a full and effective response.

**Creation of partnerships in the transport phase**

**Success factors**
- Partner access to the acquisition/rental of trucks and containers.
- Hiring of small and medium local carriers.
- Commitment of the partners to focus on the transport process.

**Key Challenges**
- Competitiveness of small and medium-sized transport companies versus larger transport companies.
- Limited availability of small and medium carriers.

**Creation of partnerships in the reuse, recycling and disposal phase**

**Success factors**
- Partnerships with local and international organizations that focus on recycling, empowerment, capacity development and community work (establishing micro-enterprises, and workshops).
- Promoting the participation of construction workers, small entrepreneurs and artisans from the neighborhoods.

**Key Challenges**
- Lack of government provisions for recycling debris.
- Difficulties in understanding the process of recycling and management of workshops at the partner level.

**UNDP**
Demolition of hazardous structures, creating short-term jobs under Cash for Work as well as Cash for Production modalities, debris management and coordination of the overall programme.

**UN Habitat**
Social mobilization, organization and community planning, cadastre issues.

**ILO**
Market analysis, professional training, support in the creation of micro-enterprises.

The collaborative, coordinated and complementary approach at the UN agency level took into account the specific mandates, experiences and comparative advantages of each agency to provide a full and effective response.

**LESSONS LEARNED AND RECOMMENDATIONS**

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**2.4 COMMUNITY PARTICIPATION**

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When considering the planning of neighborhood reconstruction and development, it was crucial to revisit a particular aspect of their development: beneficiary neighborhoods were largely part of an area where public authorities had never planned its development and inhabitants most often built their homes in precarious conditions. Subsequently, these communities had a singular history of self-organization.

This specifically provided the neighborhood inhabitants with a sense of individual and collective involvement in the development of their living environments and promoted the establishment of a number of community organizations formed by citizens concerned with the problems of their community.

This component considered the following three phases (UN-Habitat):

1. Community mobilization:
   a. Community outreach and mobilization,
   b. Development of an inventory of community-based organizations,
   c. Strengthening of community organizations in their work to raise awareness, inform and mobilize the people concerned.
   d. Structuring community-based organizations and strengthening the coordination platform,
   e. Strengthening the capacity of community leaders to mediate and resolve conflict in conducting participatory planning processes.

2. Analysis and assessment phase:
   a. Visits to districts with representatives of community-based organizations to identify priority sites, problem areas, to initiate encounters and exchanges with residents.
   b. Evaluation and prioritization of collective projects, which must be based on the prioritization of needs, but also on opportunities for operational implementation (more easily financed projects, timely opportunities).
   c. Project selection and approval of the development and reconstruction plan by community representatives.

3. Community planning:
   a. Organization of forward-thinking exercises to identify problems and define solutions. This included establishing an understanding of the mechanisms in action and prospects for action (able to generate leverage effects or virtuous circles).
   b. Development of an inventory of community-based organizations, including the progress of the urban planning project and the actions of the Debris Management Programme partners.
   c. Meetings of local stakeholders from the fields of study.

The urban study therefore allowed for the implementation of a planning process in consultation with community-based organizations. Through this approach, communities identified five key areas (environment, road infrastructure, basic urban services, public spaces and associative/cultural facilities, and housing) as a platform for a strategic action and defined the quantity and location of debris in certain cases.

Community participation in the demolition and removal phase

Success factors
- Labour-intensive Cash for Productive initiatives.
- Project ownership by the beneficiaries.
- Acceptance by the population of the removal of the debris from their neighborhood.
- Presence of a liaison officer and local engineers.
- Early identification and determination of the legal house owners.

Key Challenges
- Identification and determination of the legal house owners.
- Obtaining legal permission and demolition permits from the government and owners.

Community participation in the transport phase

Success factors
- Hiring of small and medium local carriers.
- Implementation of a ticketing system to manage and track both the quantity and location of debris along transport routes.

Key Challenges
- Reduced availability of small and medium carriers.
- Acceptance by the population of the removal of the debris from their neighborhood.
In addition to the participatory dimension popularized by the urban planning exercise, the assessment by the people served as a key input for decision making in urban planning at the neighborhood level, but also at the commune and metropolitan area level:

- At the community level, for the preparation of neighborhood reconstruction and restructuring plans.
- At the municipal level, for greater inclusion of precarious quarters and improving the local economy.
- At the metropolitan area level, for the consideration of major metropolitan problems such as drainage, mobility, water supply, waste management, etc.

The integration of the different levels was essential and allowed each exercise to feed the reflection at other levels as well as the articulation of coordination, planning and monitoring tools.

Planning exercises were conducted through focus groups and workshops, including mayors and municipal technicians, communities, urban planning professionals, academia and civil society (competent people/consumer or user associations that have worked in the general interest of the majority in planning development options and land use proposals), among others. It was fundamentally important to choose the most representative components, it was necessary to develop a real cartographic database of the study area.

This activity included several steps (UN-Habitat):

1. Recruitment and training of field workers to read cartographic and aerial images, mostly selected from the population of the target district.
2. Organization of cartographic scouting operations: data collection, reporting on aerial photographs or cartographic backgrounds (buildings, infrastructure, networks, land).
3. Digitization and integration of data to the cartographic database (data processing in geographic information system-GIS).
4. Production of location and analysis maps.

This activity included several steps (UN-Habitat):

1. Development of the questionnaire, including socio-demographical and census questions. This document was developed in consultation with the Interministerial Committee for Territorial Development (CIAT), the National Centre for Geo-Spatial Information (CNIGS) and the Haitian Institute of Statistics and Information Technology (IHSI), among others, within the framework of global harmonization of geographic information system.
2. Implementation in households for 10 days.
3. Data entry and development of database.
4. Validation of the results by the population.
5. Data processing and statistical analysis.

1. Prior to any debris management intervention, and despite the enormous time restrictions for agencies and stakeholders, it is essential to make sound and evidence-based participatory assessments about community expectations, needs, capacities and constraints, for a response that is coordinated and adapted to the complex urban reality.

2. Community platforms are effective tools for dialogue between community expectations and premises of urban planning, as well as to make sound and evidence-based participatory assessments about community expectations, needs, capacities and constraints, for a response that is coordinated and adapted to the complex urban reality.

**Community participation in the reuse, recycling and disposal phase**

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<tr>
<th>Success Factors</th>
<th>Key Challenges</th>
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<tbody>
<tr>
<td>Promotion of the participation of local construction workers, small entrepreneurs and artisans in recycling workshops and redevelopment work in neighborhoods.</td>
<td>Convincing communities about the opportunities for reuse and recycling of debris and reintegrating into the neighborhoods, which may have a negative connotation for part of the population.</td>
</tr>
<tr>
<td>Respect for the needs and priorities of communities in redevelopment programmes, using reused and recycled materials.</td>
<td></td>
</tr>
<tr>
<td>Respect for cultural specificities in the reuse and recycling of debris.</td>
<td></td>
</tr>
</tbody>
</table>

**Stages of implementation:**

1. Development: the questionnaire, including socio-demographical and census questions. This document was developed in consultation with the Interministerial Committee for Territorial Development (CIAT), the National Centre for Geo-Spatial Information (CNIGS) and the Haitian Institute of Statistics and Information Technology (IHSI), among others, within the framework of global harmonization of geographic information system.
2. Implementation in households for 10 days.
3. Data entry and development of database.
4. Validation of the results by the population.
5. Data processing and statistical analysis.

**Lessons learned and recommendations:**

1. Prior to any debris management intervention, and despite the enormous time restrictions for agencies and stakeholders, it is essential to make sound and evidence-based participatory assessments about community expectations, needs, capacities and constraints, for a response that is coordinated and adapted to the complex urban reality.

2. Community platforms are effective tools for dialogue between community expectations and premises of urban planning, as well as an important element of local governance. The effective participation of the population through community platforms must take place in the early stages of the programme and must consider gender and generational equity issues into account. Consulting the population can help refine the analysis and search for relevant community-based solutions. However, it is imperative to assist these organizations with training processes and specialized technical assistance to support the gradual transfer of responsibilities and resources.

**Surveys** were also central to the work of understanding and analysing the neighborhood. The field agents employed for the mapping were also trained as investigators, and participated in this important part of the project. Data was been collected from more than 4,000 households.

<table>
<thead>
<tr>
<th>LESSONS LEARNED AND RECOMMENDATIONS</th>
<th>I- UNDP RESPONSE TO DEBRIS MANAGEMENT IN HAITI</th>
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Methods of implementation, in a crisis situation, it is necessary to maximize benefits in terms of job creation, income and services in the affected communities, given their extreme vulnerability.

For UNDP, debris management was a departure point for reviving the local economy and revitalizing neighborhoods. From this perspective, debris management was not an end in itself but rather a means to drive the stages of rehabilitation and reconstruction and to promote the rapid return of displaced populations to their neighborhoods.

The complementarity of the implementation of massive employment programmes and the promotion of micro and small enterprises has helped to promote sustainable economic and social revitalization.

Labor-intensive (LI) schemes

Prioritizing the widespread participation of individuals through labor-intensive initiatives, with an emphasis on hiring women, was a key component of UNDP’s approach to demolition and debris removal in Haiti.

After an initial preparatory period focused on securing equipment and establishing recruitment and payment systems, UNDP began its demolition and debris clearance activities with the clearing of streets and communication routes under a Cash for Work modality to promote the mass hiring of the population, rapidly injecting vital economic resources to restore the livelihoods of beneficiaries and promote psychosocial recovery as the population became active participants rather than passive recipients.

Economic revitalization in the transport phase

Working with small local centers and the government sector, which reduced transport costs.

Competitiveness of small and medium-sized enterprises versus large transportation companies.

High transport costs.

The debate surrounding the implementation of manual, mechanical or mixed demolition and removal actions, based on the analysis of costs and the need to reactivate the local economy.

Transition from Cash for Work to Cash for Production.

II- UNDP RESPONSE TO DEBRIS MANAGEMENT IN HAITI

Although a sound and circumstantial analysis of the context will help to define the most appropriate technologies, mechanisms and methods of implementation, in a crisis situation, it is necessary to maximize benefits in terms of job creation, income and services in the affected communities, given their extreme vulnerability.

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Beneficiaries, grouped into teams, worked for two to four weeks, six days a week, at the minimum wage rate so as not to interfere with the supply and demand cycle in the local labor market and discourage hiring in the private sector.

During 2011, a new formula called Cash for Production was established under the joint debris management programme. While the old formula provided for the payment of wages based on the number of hours worked each day, the new modality was directly related to the amount of debris removed in m³, allowing workers to increase their income, sometimes significantly, and increase the productivity of the programme (up to five times).

For its implementation, mixed local teams with an average of 10-15 members (although a few organizations preferred to have teams of 20-25 people), including a team leader, were hired to demolish and manually clear the houses. These teams were trained in specialized demolition techniques, safety and health measures at work, and had access to the necessary work equipment and continuous technical monitoring by professional engineers.

Local associations and authorities were also mobilized to identify and implement other priority projects such as the construction of retaining walls and dams, cleaning of canals, improvement of access roads and excavaion, among others, allowing Haitians to take lead on the reconstruction of their communities.

Promoting small and micro enterprises

According to ILO, low levels of education and training in Haiti have led to a shortage of skilled workers in some sectors. Given the extent of the damage caused by the earthquake, the labor market in the construction and recycling sector has become an important source of long-term employment in Haiti. Therefore, UNDP, in close collaboration with ILO, promoted a major programme of debris micro-recycling in neighborhoods most affected by the earthquake in Port-au-Prince, with the goal of clearing debris in neighborhoods while strengthening the economy of the area through business development and job creation. The programme fostered the creation of micro-enterprises (small workshops) to facilitate the recovery and reuse of materials from the rubble in the implementation of reconstruction work on a small scale, thus contributing significantly to the reduction of the volume of debris for disposal, and speeding up urban, economic and social recovery.

The programme encouraged the production of innovative products with a good market demand and a catalogue of different products manufactured in the workshops to facilitate their dissemination was elaborated.

Three types of approaches were considered for its implementation:

a) - Micro and small entrepreneurs from the construction sector of each district were invited to participate as producers of recycled materials. For their participation, the contractors were asked to contribute with their companies, groups, workshops and workers, allowing Haitians to take lead on the reconstruction of their communities.

b) - Small and medium enterprises, operating in the building material sector outside of neighborhoods, intervened and invested in the production of recycled material. The entrepreneurs produced recycled products with their equipment and received technical assistance from the project.

c) - Groups of young people trained in business management and the technical aspects of recycling, organized production units of recycled materials, enabling them to become entrepreneurs in the recycling sector. The project supported some of these young people to organize working groups so that their production units could become micro-enterprises.

In this way, UNDP worked to ensure that maximum resources were spent on the local economy and employment, and to promote income-generating activities in the districts, relying on the Haitian private sector.
An environmental approach...

In Haiti, there was not a facility capable of receiving and processing the massive amounts of debris, estimated at more than 10 million cubic meters for the entire country. Furthermore, in the absence of a national debris management strategy, debris could be cleared and disposed of in an uncontrolled manner.

In this context, the Government designated the site of Truitier, the usual site for solid waste disposal in the city of Port-au-Prince, as the official site for the massive discharge of debris to facilitate the rapid cleaning of the city and avoid or mitigate environmental and public health hazards caused by the uncontrolled discharge of debris.

Thus, UNDP and its partner agencies began the controlled management of debris, focusing first on the options for reuse and recycling “in situ”, in order to reduce volumes for final disposal, promote economic activity within neighborhoods and encourage the reuse of materials in local redevelopment programmes.

Recycling and reuse of debris in the planning phase

### 2.6 RECYCLING AND REUSE OF DEBRIS

#### Success factors

| Participatory and joint planning process with experienced local and international organizations. |
| Lack of references from previous programmes in recycling and reuse of debris in post-crisis situations. |
| Promoting the participation of construction workers, small businessmen and artisans in neighborhoods. |
| Lack of experience within the UN team in debris recycling. |
| Achieving a change in community perception of the debris, from waste to resource. |
| Poor feasibility studies. |
| The prestige of the UNDP at the government level to determine which products could be developed from debris, and how and where they could be used. |
| Development of a recycling strategy before engaging with communities. |
| Determining areas for the use of recycled and reused products. |
| Cultural resistance to the reuse and recycling of debris. |

#### Key Challenges

| Participatory and joint planning process with experienced local and international organizations. |
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| Lack of experience within the UN team in debris recycling. |
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#### Lessons Learned and Recommendations

1. - Debris management must combine the use of heavy machinery and intensive-labor (IL) to demolish, clear and classify the debris in the most efficient way. Therefore, it is necessary to establish clear action priorities and balance the need for the injection of cash into the neighborhoods with the productive yields of the machinery.

2. - The intensive-labor method proved to be a suitable approach in densely-built neighborhoods, due to the abundance of local underemployed workforce and the difficult access for vehicles. The design of return support programmes must prioritize the massive hiring of neighborhood residents through Cash for Production schemes rather than Cash for Work ones, which proved significantly less profitable.

3. - The presence of women in work teams is a valuable asset, as they were able to not only assume different roles within demolition teams, even those considered the most physically challenging, but also proved to be more disciplined, responsible and committed to work. Their inclusion, however, is not always immediate, requiring a process of individual and social acceptance.

4. - The production or manufacturing of recycled material from debris must aim for fluid production, marketing and sales of the products. In this context, any product to be integrated in the commercial chain should provide added value to facilitate its introduction, whether an innovative approach, or favorable conditions in terms of price and quality compared to available products on the market.

#### And... a resource for reconstruction

Following technical studies by national and international laboratories, the Government of Haiti decided to increase the use of recycled products derived from debris in non-structural work.
To promote and facilitate the massive, safe, effective, tested and quality-certified recycling of debris, UNDP, in partnership with the Ministry of Public Works, Transport and Communications and UNOPS, installed a macro site for the crushing and processing of debris in downtown Port-au-Prince, called the Truman site, where debris was processed into various products, such as cobblestones, with a production of more than 20,000 per week. The site promoted the recovery of large volumes of construction materials such as sand, aggregates and blocks, maximizing the reuse of materials by national and international cooperation organizations, construction companies and communities, through their free provision for reconstruction activities. This facility promoted a significant reduction in the volume of debris for final disposal - estimated at approximately 20-25%. The debris that did not meet the recycling quality standards was delivered directly to Truitier.

Additionally, the Debris Management Working Group, coordinated by the MITFC and supported by UNDP, launched an initiative in Haiti called “The debris exchange” (La bourse aux débris) which provided storage for debris removal organizations so that other organizations could then use the debris for recycling and construction. The idea was to bring together debris providers and seekers.

To achieve this, a letter of agreement was signed between debris “donors” and “users”, the donors being responsible for producing and making debris available to the user or directing them to the UN processing site (Truman), based on the specific requirements concerning the volume and size of the aggregates.
The phenomena of urban sprawl and uncontrolled urbanization have illustrated the fragility of Haitian cities such as Port-au-Prince and Léogâne, in the face of regular, latent or even exceptional hazards. This fragility is even greater for the poorest populations. For UNDP, disaster risk is a major obstacle to sustainable development and can cause devastating effects on people, environments and economies. Therefore, sustainable development depends on the successful incorporation of disaster risk management in the planning process of urban development, including prevention, preparedness and mitigation components.

In Haiti, reducing the vulnerability of the most exposed and poorest populations in the country was a priority to ensure the sustained development of cities and minimizing future urban vulnerabilities:

1. To support the Haitian national disaster risk reduction system, UNDP assisted the Government of Haiti with the development of seismic zoning maps at the national level. Access to this cartographic information proved crucial to informing decision-making on urban land and urban planning, becoming a vital tool for the resilient reconstruction of the country.

2. Through local employment programmes, and as part of an overall risk reduction plan in each affected town, UNDP supported the implementation of mitigation projects identified and implemented by community-based organizations, in close collaboration with local authorities following their own process of participatory planning. Community organizations

LECONS LEARNED AND RECOMMENDATIONS

1. Urban disasters, which produce millions of tons of debris, have proved to be an unavoidable opportunity for implementing recycling programmes. According to studies carried out by specialized companies, an average of 30-40% of urban debris is recyclable. Debris reuse and management of the remaining 60-70% must be considered from the beginning.

2. - Debris recycling alternatives must be specified by the Government on the basis of composition studies and specific quality standards from accredited laboratories, to decide if they are to be used as (mainly) structural or non-structural materials. 

3. - The reuse and recycling activities at the neighborhood level (in situ) are limited in terms of low volume of production and unclear quality of materials. In a post-crisis context, it is necessary to promote massive reuse and recycling programmes to ensure the recovery of raw materials, reduce production costs, and work in accordance with quality standards and market access.

4. - The inclusion of recyclers, small and medium entrepreneurs from the solid waste management and construction sectors in reuse and recycling programmes is a great asset, even if capacity development and training in specific alternative technical areas is required.

5. - The systematic integration of debris management initiatives with other recovery and development efforts is not only an essential approach to ensure the holistic management of debris but also an effective strategy for the marketing of recycled products.

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2. To ensure effective community involvement in the identification of risks, participatory development of risk maps at the neighborhood level should be promoted, and the achievement of subsequent mitigation and prevention activities ensured based on Cash for Production or Cash for Work schemes.

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### Success factors

| Use of recycled debris materials for the production of mitigation works (retaining walls, embankments) |
| Degree of debris contamination |
| Difficulty in performing the most decisive actions to reduce future disasters and tackle the main causes of vulnerability (hazardous location of homes, legal vacuum in land planning, etc.) |

### Key Challenges

| Debris quality |
| Weaknesses of government provisions for debris recycling |

In Haiti, UNDP linked its debris management programme with other rehabilitation and reconstruction programmes promoted by the government and the UN system.

The work done in the neighborhoods under the debris management programme led to cleared and accessible streets and land, land planning procedures, an engaged, motivated and organized population, skilled labor, formalized small entrepreneurs trained in practical issues relating to the safe repair, construction and demolition of houses, and quality recycled materials, which are significant assets in promoting return efforts and community actions in the long term.

Therefore, the debris management programme can be considered the cornerstone of a global reconstruction and development process for the affected communities through the implementation of various complementary and connected programmes.

The community-based participatory approach of the debris management programme enabled UNDP, in close collaboration with UN-Habitat, to address the “Community Planning” component of the Government driven 16/6 Project, aimed at helping communities in six camps return to their 16 areas of origin. In this context, the debris management programme facilitated the establishment of discussion and decision-making platforms.

**2.8 LINKING DEBRIS MANAGEMENT INITIATIVES WITH OTHER RECOVERY AND DEVELOPMENT EFFORTS**
**CHAPITRE I CONCEPTUALISATION ET PLANIFICATION DE L’INTERVENTION EN HAITI**

**Use of recycled debris for other reconstruction programmes.**

**Key Challenges**

- **Debris quality.**
- **Degree of debris contamination.**
- **Weaknesses of government provisions for debris recycling.**

---

**LESSONS LEARNED AND RECOMMENDATIONS**

1. The effective management of debris, including the demolition of at-risk homes is complex and difficult to implement if the programme does not have the necessary financial and technical assistance for the reconstruction of demolished houses. Therefore, those affected households without access to alternative housing are reluctant to leave their homes and simply make minimum repairs that they consider sufficient to allow them to return to their home.

2. To ensure the continuity of the intervention, it is imperative to promote, from the early planning stages, the linkage and consistency of early recovery - rehabilitation/reconstruction - development, and encourage local ownership of the process for a successful exit strategy.

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### Link with other recovery initiatives in the planning phase

**Success factors**

- The vision of debris management as an open door for development, allowing for other rehabilitation and reconstruction initiatives.

**Key Challenges**

- Providing programme continuity beyond the emergency and early recovery stage.

---

### Link with other recovery initiatives in the demolished and removal phase

**Success factors**

- Debris removal as a starting point for the gradual return of the population to their neighborhoods and beginning of reconstruction projects.
- Once the debris has been removed from neighborhoods, links at the community level remain, allowing for the entry of other reconstruction projects.

**Key Challenges**

- Official classification of levels of structural damage to the buildings and houses.
- Obtaining demolition permits from the owners.

---

### Link with other recovery initiatives in the reuse, recycling and disposal phase

**Success factors**

- Use of recycled debris for other reconstruction programmes.

**Key Challenges**

- Debris quality.
- Degree of debris contamination.
- Weaknesses of government provisions for debris recycling.

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**Figure 4. The link with other recovery and development initiatives**

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### Diagram: Debris management Programme

- Project 16 neighborhoods, 6 camps (16/6)
- CARMEN Community Resource Centers for House Repairs

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**Table:**

<table>
<thead>
<tr>
<th>Success factors</th>
<th>Key Challenges</th>
</tr>
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<tbody>
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**Project 16:**

- 16 neighborhoods, 6 camps (16/6)
UNDP’s strategy for debris management was, thus, based on maximizing the benefits that could be derived from debris during its life cycle, providing raw material for reconstruction, a resource for job creation and a means for local revitalization.

<table>
<thead>
<tr>
<th>Results</th>
<th>Quantitative indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>House demolition and debris removal</td>
<td>Number of demolition permits signed and approved</td>
</tr>
<tr>
<td></td>
<td>Volume of debris cleared</td>
</tr>
<tr>
<td>Economic revitalization</td>
<td>Number of persons engaged (temporary employment)</td>
</tr>
<tr>
<td></td>
<td>Number of debris processing and recycling micro-enterprises created</td>
</tr>
<tr>
<td>Recycling and reuse of debris</td>
<td>Volume of debris transported to recycling facilities</td>
</tr>
<tr>
<td></td>
<td>Volume of debris recycled or reused</td>
</tr>
<tr>
<td>Contribution to the reconstruction</td>
<td>Number of neighborhood redevelopment plans elaborated</td>
</tr>
<tr>
<td></td>
<td>Amount of materials from recycling used in reconstruction projects</td>
</tr>
<tr>
<td>Local capacity development</td>
<td>Number of guides and policies promoted/developed</td>
</tr>
<tr>
<td></td>
<td>Number of people trained in the techniques of debris recycling, seismic construction</td>
</tr>
<tr>
<td></td>
<td>Number of people trained in business management</td>
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</tbody>
</table>
The January 2010 earthquake in Haiti proved to be an unprecedented disaster in the country, striking its urban, political, administrative, economic, demographic centre and generating a crisis in an already fragile and vulnerable country.

The destruction of thousands of buildings and infrastructure produced an enormous volume of debris that had to be cleared not only to avoid serious environmental problems caused by the risks associated with their uncontrolled disposal but, more importantly, as a precondition for the implementation of recovery and reconstruction programmes.

The strategy of the UN debris management programme in Haiti, following a comprehensive life cycle approach, was found to be effective. It also sought to ensure minimal environmental impact, the optimal recycling of materials and the competitiveness of recycled products, making debris an important resource for the generation of employment in the short and long term, and effective raw material for reconstruction.

In order to respond to a key concern of the affected populations, the programme prioritized the creation of income-generating activities for neighborhood residents through Cash for Work and Cash for Production mechanisms, the latter proving to be more effective in the demolition, removal and transportation of debris.

To this end, it was fundamentally important to choose the most representative and recognized local authorities and community structures during the conceptualization and implementation phases at the communal level, following a creative approach to the territorial and social dynamics and challenges. Partnerships at the national, local and community level proved to be essential to the success of the programme, favoring ownership by affected populations and proving to be a solid exit strategy, making neighborhood residents the main actors in their own reconstruction.

The debris management programme simultaneously proved to be a remarkable opportunity to contribute to the reduction of risks in urban areas, especially for the very poorest people, ensuring the foundations for a sound and sustainable development.
United Nations Development Programme
Bureau of PNUD, MINUSTAH, Log Base (Zone 5)
Blvd Toussaint Louverture & Claircine 18
B.P. 557
Port-au-Prince, Haïti (W.I.)
Telephone : +509 36 09 86 12 / 37 64 35 80 / 34 84 58 51
E-mail : communication.ht@undp.org
Web Page : http://www.ht.undp.org

Photo credits: Afke Bootsman, Paola Soldà and Jean Marie Duval (UNDP Haiti), Paula Iñuriz (UNDP RSC LAC), Therese Foster (CHL International).