



NIGERIA

Post-Disaster Needs Assessment

2012 Floods

A report by
The Federal Government of Nigeria
With Technical Support from the World Bank,
EU, UN, and Other Partners

June 2013



With financial support from:



THE WORLD BANK
Working for a World Free of Poverty

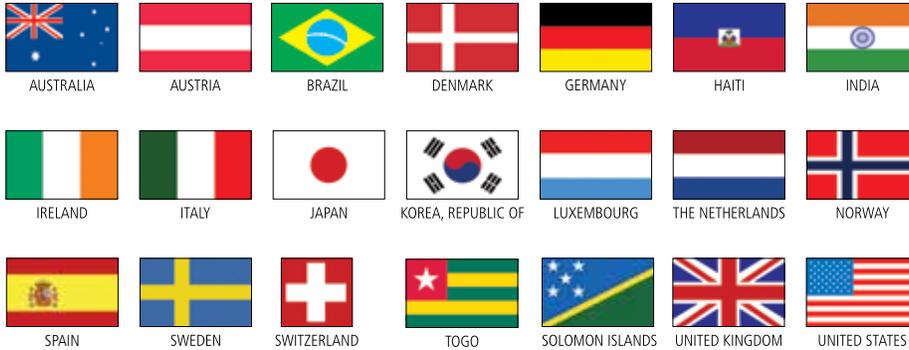


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GRAND-DUCHÉ DE LUXEMBOURG
Ministère des Affaires étrangères

Direction de la coopération au développement



FOREWORD

Floods are the most common and recurring disaster in Nigeria. The frequency, severity, and spread of these floods are increasing. Beginning in July 2012, heavy rains struck the entire country. The impact of the 2012 flooding was very high in terms of human, material, and production loss, with 363 people killed, 5,851 injured, 3,891,314 affected, and 3,871,53 displaced.

We are pleased to present the findings of the Post-Disaster Needs Assessment (PDNA), conducted at the request and direction of the Federal Republic of Nigeria with technical support from the World Bank, the European Union, and the United Nations. The PDNA provides a comprehensive and thorough assessment of both economic and social impacts caused by the flooding, as well as recommendations for immediate recovery and long-term resilience building in the country. The analysis of the damage and loss assessment has identified the needs and quantified financial requirements that will facilitate formulating comprehensive early recovery actions, medium-term recovery and reconstruction plans, and a long-term risk management and reduction strategy. This should be formulated, adopted, and implemented to reduce the impact of future disasters, which are likely to be more intense due to climate change.

The PDNA report was prepared jointly by the Government of Nigeria and its key ministries under the coordination of the National Emergency Management Agency (NEMA).

We are grateful for the efforts of the government agencies, private sector, civil society organizations, and international development partners who were involved in preparing the PDNA, and we look forward to working together to address the needs of those affected by the flood disaster and to develop programs to reduce the country's exposure to disaster risk.

ACKNOWLEDGEMENTS

This Post-Disaster Needs Assessment (PDNA) report was prepared by a joint team working under the guidance of the National Emergency Management Agency (NEMA) and consisting of representatives of the federal government of the Republic of Nigeria and members of the international community. The joint team was led by the World Bank (WB), primarily on Damage and Loss Assessment (DaLA) and by the United Nations (UN) with respect to Human Recovery and Needs Assessment (HRNA). The team was supported by the Global Facility for Disaster Reduction and Recovery (GFDRR), the European Union (EU), and Japanese International Cooperation Agency (JICA).

The joint team is grateful to Nigerian government policymakers and senior officials for their leadership throughout the assessment, particularly: Alhaji Muhammad Sani Sadi, Director General, National Emergency Management Agency (NEMA); Aliyu Baffale Sambo, Deputy Director (NEMA); members of the Presidential Committee on Flood Relief and Rehabilitation, co-chaired by Aliko Dangote and Olisa Agbakoba and including Alhaji Karami Isiaku Rabi, Alhaji Mohammed Indimi, Ngo Hannatu Cholum, Folorunsho Alakija, Dora Akunyili, and Tony Elumelu. The team equally thanks the Secretary-General of the Nigerian Red Cross, representatives of the Christian Association of Nigeria (CAN), the National Supreme Council of Islamic Affairs (NSCIA), the United Nations Development Program (UNDP), the European Union (EU), the Department for International Development (DFID), and the United States Agency for International Development (USAID). Similarly indispensable were contributions from the permanent secretaries of the Federal Ministries of Environment, Water Resources, Works, Agriculture, Health, Finance, and National Planning, along with those of the Ecological Funds Office, the Acting Commissioner of the National Commission for Refugees, the Chairman of the Senate Committee on Spe-

cial Duties, the Chairman of the House Committee on Environment, representatives from the Nigerian Union of Journalists (NUJ) and from the National Council of Women's Societies (NCWS), Tunde Lemo of the Central Bank of Nigeria (CBN), Fatima Wali, Frank Nweke Jr., and Senator Florence Ita-Giwa.

The joint team would also like to acknowledge the financial support of the EU and the Ministry of Foreign Affairs of the Grand Duchy of Luxembourg. EU financial support was made possible through the African, Caribbean and Pacific-European Union (ACP-EU) Natural Disaster Risk Reduction Program, which is fully financed by the European Union in the framework of the 10th European Development Fund's Intra-ACP Cooperation Strategy (2008-2013) and managed by the GFDRR.

The international community team for Damage and Loss Assessment (DaLA) was led by Doekle Wielinga (Senior Disaster Risk Management Specialist, WB) with support from a core team consisting of Amos Abu (Senior Environmental Specialist, WB), Joseph Ese Akpokodje (Senior Environmental Institutional Specialist, WB), Asmita Tiwari (Disaster Risk Management Specialist, WB), and Sajid Anwar (Disaster Risk Management Specialist, World Bank). The team members with their respective responsibilities are: (i) Education: Olatunde Adekola (Sr. Education Specialist, WB); (ii) Health: Dinesh Nair (Senior Health Specialist); (iii) Agriculture, livestock and fisheries: Sheu Salau (Consultant, WB); (iv) Livelihoods: Roberto Jovel, Consultant, World Bank and Antonio Cruciani (ILO); (v) Trade and commerce: Richard Sandall (Private Sector Development Specialist, WB); (vi) Energy: Edouard Ereño Blanchet (Disaster Risk Management Analyst, WB); (vii) Water and hydromet: Katsuhito Miyake (Senior Disaster Risk Management Specialist, WB) and Kitamura (Consultant, JICA); (viii) Disaster risk management: Asmita Tiwari (Disaster Risk

Management Specialist, WB); (ix) Disaster risk reduction investment: Stephen Danyo (Natural Resources Specialist, WB); (x) Environment: Joseph Ese Akpokodje (Senior Environmental Institutional Specialist, WB); and (xi) Macroeconomic impact assessment: Roberto Jovel (Consultant, WB) and Olayinka Babalola (Economist, World Bank). Roberto Jovel (DaLA Expert, Consultant, WB) and Asha kambon (DaLA Expert, Consultant, WB) provided DaLA methodology training and support throughout the assessment. Keiko Saito, (Disaster Risk Management Specialist, WB/GFDRR) provided spatial assessment and mapping support in the assessment. Asmita Tiwari (Disaster Risk Management Specialist, WB), and Sajid Anwar (Disaster Risk Management Specialist, World Bank) coordinated trainings, multi-sectoral teams and supported compilation and finalization of the report. Nnaemeka Chukwuone (consultant, WB) provided support in compiling and editing the PDNA report. Rami Quttaineh (Senior Disaster Risk Management Specialist, WB) provided support in training and Laetitia Barnier (consultant, WB) supported data management. Omezikam Onuoha (consultant, WB) and Abiodun Elufioye (Program Assistant, WB) provided support in coordination and logistical arrangements.

The WB team worked under management guidance from Marie Françoise Marie-Nelly (Country Director, Nigeria, WB); Jamal Saghir (Sector Director, Sustainable Development, WB); Benoit Bosquet (Sector Manager, Environment and Disaster Risk Management, WB); Christoph Pusch (Practice leader, Africa Disaster Risk Management, WB), Francis Ghesquiere (Manager, GFDRR) and Raja Rehan Arshad (Lead Disaster Risk Management Specialist, GFDRR).

The international community team from the UN system was led by Seth Vordzorgbe along with Jantomas Hiemstra and Rita Missal. The team members with their respective responsibilities in HRNA are: (i) Agriculture, Fisheries and Livestock: Rabe Mani (FAO), Femi Amure (WFP) and Francois Mkovonga (WFP); (ii) DRR: Alao Mathew (UNDP), Datus Rutashobya (WMO) and Kathrin Schweppe (UNDP); (iii) Education: Oluseyi Soremekun (UNESCO), Annelies Ollievz (UNICEF), Judith Giwa-Amu (UNICEF), and George

Igelegbai (UNICEF); (iv) Employment: Chinyere Emeka-Anuna (ILO), Antonio Cruciani (ILO), and Dennis Zulu (ILO); (v) Energy: Alhaji Mustapha (UNIDO); Environment: Muiyiwa Odele (UNDP); (vi) Gender: Joy Micheal (UNFPA) and Gloria Enueze (UNFPA); (vii) Governance and Public Infrastructure: Andrew David Adejo (UNDP); (viii) Health: Godwin Asuquo (UNFPA), Idowu Araonyibo (UNFPA), Saratu Yunusa (UNICEF), Andrew Griekspoor (WHO), Dr Irene Isibor (WHO), and Dr Emmanuel Musa (WHO); (ix) Shelter and housing: Kabir M. Yari (UN Habitat); and (x) WASH: Ajibade Olokun (UNICEF). Prof. Edwin Iguisi, Prof Samuel Arokoyu, Prof Umar Maryah, Dr. Kingsley Ogboi, Prof Ola Asimiyu Jinadu, and Dr. Ibidun Adelekan coordinated interviews and surveys in affected states.

Many Government officials from the local authorities and line ministries participated in the assessment, including: from the Ministry of Education, Ihekweba Obiageli, Deputy Director; Folake Olatunji-David, Assistant Director; Mary A. Ameh, Assistant Director; Vera Okoli-Etolue, Assistant Director; O. N. Anyaoku, Assistant Director; A. H. Onehi, Assistant Chief Education Officer; and Oluwasegun Sobogun, Chief Education Officer; from the Ministry of Lands, Housing and Urban Development, Anene Chimezie, Deputy Director; Mathias J. Akasseh, Assistant Chief Land Officer; from the Ministry of Health, S. Belgore, Deputy Director, Nigerian Centre for Disease Control; K. Fadahunsi, Medical Officer; and Ismalia Shinkafi, Assistant Chief Scientific Officer; from the Ministry of Agriculture and Rural Development, O. O. Oshadiya, Assistant Director; J. O. Babatunde, Assistant Director; and E. A. Kosoko-King, Assistant Director; from the Ministry of Commerce and Industry, Nkem Anucha, Senior Executive Officer; and Hassan Usman Gwandu, Administrative Officer 1; from the Ministry of Power, Shanu R. Adeshina, Principal Technical Officer I; Philip Abel, Electrical Engineer II.; Francis C. Metu, Electrical Engineer I; and from the Ministry of Works, Paul A. Chidawa, Chief Technical Officer; Usman Yakubu, Principal Civil Engineer; Edward Onokpasa, Executive Engineer II; Uchechukwu G. Osuji., Executive Engineer II; and Edmond Onyechokwa, Principal Engineer; from the Ministry of Water Resources, A. Edu Folorunso, Geologist I; Ve-

ronica N. Obuzor, Principal Technical Officer; Margaret Annahyafi, Principal Scientific Officer; and Charles Mbama, Scientific Officer I; from the Ministry of Labour and Productivity, Frank Uko Daniel, Assistant Director; C. D. Archibong, Assistant Director, Statistics; Joseph Akpan, Chief Labour Officer; A. C. Aprezi, Chief Labour Officer; Murna Joy Loma, Principal Labour Officer; Yunusa Abdulkareem, Labour Officer; and Imeh Rhoda Ogedi, Statistician; from the Ministry of Women Affairs and Social Development, Friya Kimda Bulus, Assistant Director; Nkechi Onwukwe, Assistant Director; and Samalia Adamu, Chief Community Development Officer; from the Ministry of Environment, M. A. Oyeleke, Deputy Director; G. B. Jegede, Assistant Director; Engr. M. A. Kopada, Assistant Director; Musa Labaran, Principal Engineer; Hanson Ifiok, Environmental Health Scientific Officer I; and Bankole Babalola, Consultant. Additional support was offered by the Ministry of Finance. Other contributors include, from the National Emergency Management Agency, Musa Abdulrazaq, Principal Disaster Risk Reduction Officer; Edward S. Dimas, Assistant Chief Disaster Risk Reduction Officer; Akiode Saheed, Assistant Chief Training Officer; Amina Saleh, Senior Disaster Risk Reduction Officer; Fred Anusim, Principal Disaster Risk Reduction Officer; Garki I. Abbani, Principal Disaster Risk Reduction Officer; Raji Adejoke, Senior Planning Officer; Ann Nwitezze, Senior Disaster Risk Reduction Officer; Shafiu Sidi, Disaster Risk Reduction Officer I; Amina Aro-Lambo, Disaster Risk Reduction Unit; and Mercy Ufondu, Disaster Risk Reduction Unit; from the Nigerian Hydrological Services Agency, Michael I. Nwabufo, Deputy Director; Bashir Sulaiman, Assistant Director, Hydro Geologist; Fashe Francisca, Assistant Director, Hydro Geologist; J. B. Bisong, Assistant Director; P.T. Kunsuk, Assistant Chief Hydrologist; D. Amodu, Assistant Chief

Hydrologist; and A. U. Usoroh, Chief Technical Officer; from the National Space Research and Development Agency, Olabamiji Olojo, Senior Scientific Officer; Abdulkareem Isa, Scientific Officer; and Asma T. Ibrahim, Chief Scientific Officer; from the Nigerian Metrological Agency, S. M. Wilson, General Manager; from the National Oil Spill Detection and Response Agency, Chibunna O. Igwe, Senior Environmental Scientist; Ifeoma Ani, Environmental Scientist I; and Folusho Ayodele, Principal Statistical Officer; from the National Planning Commission, Lanre Adekanye, Assistant Director; Philip Obasi, Principal Planning Officer; and Thomas Ochepe, Planning Officer; from the National Population Commission, Vandu Stephen Tsakma, Deputy Director; and Moses C. John, Deputy Director; from the Nigerian Bureau of Statistics, Ngozi Nwokedi, Assistant Director; and Sanusi Ahmed, Statistician; from the Budget Office, Tochukwu Nwachukwu, Economist; from the Office of the Chief Economic Adviser to the President, Eme Dada, Economist; and from the Power Holding Company of Nigeria, A. Abdulkareem, Officer II.

The guidance and inputs of many state and local government ministries, departments and agencies have contributed greatly towards the completion of this report. The PDNA team wishes to acknowledge and thank the people interviewed in the states surveyed for the time and insights they provided to the team, as well as state and local government officials that provided technical expertise and support during the field work phase. The PDNA team gratefully acknowledges the hard work of everyone that contributed to this report, including the support staff that helped manage trainings and other logistical arrangements for field trips and group sessions. ■

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ACRONYMS AND ABBREVIATIONS

ARI	Acute Respiratory Infections
ART	Anti Retroviral Therapy
ATA	Agricultural Transformation Agenda
BEOC	Basic Emergency Obstetric Care
BoPs	Balance of Payments
CAN	Christian Association of Nigeria
CBN	Central Bank of Nigeria
CDR	Case Detection Rate
CEDAW	Committee on the Elimination of Discrimination Against Women
CJ	Chief Judge
CJN	Chief Justice of the Federation
CMO	Catchment Management Officer
CPI	Consumer Price Index
CSO	Civil Society Organizations
DaLA	Damage and Loss Assessment
DFID	Department for International Development
DISCO	Distribution Company
DOTS	Directly Observed Treatment Short Course
DRR	Disaster Risk Reduction
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
EFCC	Economic and Financial Crimes Commission
EFCZM	Department of Erosion, Flood, and Coastal Zone Management
EIU	Economist Intelligence Unit
ERRA	Earthquake Rehabilitation and Reconstruction Authority
EU	European Union
FAO	Food and Agriculture Organization
FCT	Federal Capital Territory
FEC	Federal Executive Council
FEPA	Federal Environmental Protection Agency
FEWS	Flood Early Warning System
FGN	Federal Government of Nigeria
FIC	Fully Immunized Children
FIMA	Flood Impact on MDGs Analysis
FMARD	Federal Ministry of Agriculture and Rural Development
FME	Federal Ministry of Education
FMENV	Federal Ministry of Environment

ACRONYMS AND ABBREVIATIONS (cont.)

FMF	Federal Ministry of Finance
FMH	Federal Ministry of Health
FMLHUD	Federal Ministry of Housing and Urban Development
FMP	Federal Ministry of Power
FMT	Federal Ministry of Transport
GDP	Gross Domestic Product
GENCO	Generation Companies
GEVC	Grassroots Emergency Volunteer Corps
GFDRR	Global Facility for Disaster Reduction and Recovery
GFKKF	Fixed Gross Capital Formation
GIS	Geographic Information System
H5N1	Avian Influenza Virus
HDI	Human Development Index
HFA	Hyogo Framework for Action
HIV	Human Immuno-Deficiency Virus
HRNA	Human Recovery Needs Assessments
ICPC	Independent Corrupt Practices Commission
IDPs	Internally Displaced Persons
IFRC	International Federation of Red Cross and Red Crescent Societies
IPDs	Immunization Plus Days
ITD	Inter-Tropical Discontinuity
IWRMC	Integrated Water Resources Management Commission
JICA	Japanese International Cooperation Agency
LEC	Local Executive Council
LEMA	Local Emergency Management Agencies
LGAs	Local Government Areas
M&E	Monitoring and Evaluation
MARD	Ministry of Agriculture and Rural Development
MARN	Ministry of Agriculture
MCC	Mission Control Center
MCH	Maternal and Child Health
MDAs	Ministries, Departments, and Agencies
MDGs	Millennium Development Goals
MMR	Maternal Mortality Ratio
MoU	Memorandum of Understanding
MSMEs	Micro, Small, and Medium Enterprises
MSS	Midwives Services Scheme
NASRDA	National Space Research and Development Agency
NBS	National Bureau of Statistics
NCDC	Nigeria Civil Defence Corps

ACRONYMS AND ABBREVIATIONS (cont.)

NCWS	National Council of Women's Societies
NDMF	National Disaster Management Framework
NEMA	National Emergency Management Agency
NEWMAP	Nigeria Erosion and Watershed Management Project
NFIs	Non-Food Items
NGI	Norwegian Geotechnical Institute
NGOs	Non-Governmental Organizations
NIHSA	Nigeria Hydrological Services Agency
NIMET	Nigerian Meteorological Agency
NIRSAL	Nigeria Incentive-based Risk-sharing System for Agriculture Lending
NISS	National Influenza Sentinel Surveillance
NIWRMC	Nigeria Integrated Water Resources Management Commission
NPA	Nigerian Port Authority
NPC	National Population Commission
NSCIA	National Supreme Council of Islamic Affairs
NSHDP	National Strategic Health Development Plan
NUJ	Nigerian Union of Journalists
NWRI	National Water Resources Institute
OCHA	Office for the Coordination of Humanitarian Affairs
ODPs	Other Development Partners
PDNA	Post-Disaster Needs Assessment
PHC	Primary Health Care
PHCN	Power Holding Company of Nigeria
RBDA	River Basin Development Authorities
SEC	State Executive Council
SEMA	State Emergency Management Agencies
SGF	Secretary to the Federal Government
SMEDAN	Small and Medium Enterprises Development Agency of Nigeria
SOP	Standard Operating Procedure
SSG	Secretary to the State Government
TRANSYSCO	Transmission Company
UN	United Nations
UNDP	United Nations Development Program
UN-ECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNEP	United Nations Environment Program
UNESCO	United Nations Education Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNISDR	United Nations International Strategy for Disaster Reduction
USAID	United States Agency for International Development
VCA	Vulnerability and Capacity Analysis

ACRONYMS AND ABBREVIATIONS (cont.)

WAEC	West African Examination Council
WASH	Water Supply, Sanitation, and Hygiene
WB	World Bank
WFP	World Food Program
WHO	World Health Organization

Weights and Measures

kWh	Kilowatts
km	Kilometer
km ²	Square Kilometer
MW	Megawatt
mm	Millimeter

Currency and Equivalents

Currency Unit = Nigerian Naira
US\$ = N160

Abbreviations of Professional Titles

ACDRR	Assistant Chief Disaster Risk Reduction Officer	GM	General Manager
ACEO	Assistant Chief Education Officer	HG1	Hydro Geologist
ACSO	Assistant Chief Scientific Officer	MO	Medical Officer
CCDO	Chief Community Development Officer	PCE	Principal Civil Engineer
CEO	Chief Education Officer	PDRRO	Principal Disaster Risk Reduction Officer
CLO	Chief Labor Officer	PLO	Principal Labor Officer
CSO	Chief Scientific Officer	PPO	Principal Planning Officer
CTO	Chief Technical Officer	PST	Principal Statistical Officer
DRR	Disaster Risk Reduction Unit	PTO 1	Principal Technical Officer 1
DRRO	Disaster Risk Reduction Officer	SDRRO	Senior Disaster Risk Reduction Officer
EE Engr.	Electrical Engineer II	SEO	Senior Executive Officer
EE II	Executive Engineer II	SES	Senior Environmental Scientist
EHS 1	Environmental Health Scientific Officer I	SO	Scientific Officer
ES II	Environmental Scientist II	SPO	Senior Planning Officer
ESI	Environmental Scientist I	STAT	Statistics
Geo 1	Geologist 1		



Lagos, Nigeria. Photo: Thinkstock.com

EXECUTIVE SUMMARY

Floods are the most common and recurring disaster in Nigeria. While they impact the country each year, the damage and losses from the 2012 floods were unprecedented. Heavy rains between July and October 2012 combined with rising water levels resulting from the runoff contributed to the flooding of human settlements located downstream of the Kainji, Shiroro, and Jebba dams on the Niger River; the Lagdo dam in Cameroun on the Benue River; the Kiri dam on the Gongola River; and several other irrigation dams. In some cases, the dams were damaged; in others, water had to be released at full force to avert an overflow. According to the National Emergency Management Agency (NEMA), 363 people were killed, 5,851 injured, 3,891,314 affected, and 3,871,53 displaced due to the resulting floods.

To determine the impact of the floods and the resulting post-disaster recovery, reconstruction, and resilience needs, a Post-Disaster Needs Assessment (PDNA) was undertaken from November to December 2012. The main objectives of the PDNA were to: (i) assess the damage and losses caused by the disasters; (ii) estimate the overall impact of the 2012 floods on the socio-economic development of the country at the national level and on affected states and communities; (iii) develop a Recovery and Reconstruction Framework presenting the early-, medium- and long-term recovery and reconstruction needs, with costs and a timeline in one consolidated report; (iv) ensure that strategies for recovery integrate concepts of disaster risk reduction and “build back better,” plus address gender and environmental concerns; and (v) recommend and define a strategy for Disaster Risk Management in the country.

The PDNA methodology combines two distinct and complementary methods of assessing the disaster effects, impact and needs: 1. The time-proven Damage, Loss and Needs Assessment (DaLA) methodology, originally developed by the United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC)¹ in the early 1970s and further updated and expanded by the World Bank’s Global Facility for Disaster Reduction and Recovery (GFDRR);² and 2. The Human Recovery Needs Assessment (HRNA) methodology that is under further elaboration by the United Nations System. The DaLA portion of the PDNA estimated the following three items: (i) **Damage**, which refers to the monetary replacement value of the completely or

¹ Economic Commission for Latin America and the Caribbean, *Handbook for Estimating the Socio-economic and Environmental Impact of Disasters*, United Nations, Santiago, 2003.

² Global Facility for Disaster Reduction and Recovery, *Guidance Notes for Damage, Loss and Needs Assessment; Volume 1, How to conduct a damage, loss and needs assessment, Volume 1, 2010; How to estimate sectoral damage and losses, Volume 2, 2010; How to estimate post-disaster needs for economic recovery and reconstruction, Volume 3, 2010; How to estimate disaster impact at macro-economic and at personal levels, Volume 4* (In preparation), The World Bank, Washington, D.C.

Table ES-1: Summary of Damage and Losses Caused by the 2012 Floods in Nigeria's Most Affected States

Sector	Subsector	Disaster Effects, million Naira		
		Damage	Losses	Total
Social		1,256,299.3	73,557.9	1,329,857.2
	Education	82,134.6	15,211.2	97,345.8
	Health	18,204.8	9,476.8	7,681.7
	Housing	1,155,959.9	48,869.9	204,829.7
Productive		147,996.5	1,037,070.0	1,185,066.5
	Agriculture	101,008.2	380,520.8	481,528.9
	Manufacture	21,795.2	74,425.0	96,220.2
	Commerce	18,693.1	357,124.2	375,817.3
	Oil industry	6,500.0	225,000.0	231,500.0
Infrastructure		54,019.6	8,013.6	62,033.2
	Water and Sanitation	12,902.2	--	12,902.2
	Electricity	329.0	8,013.6	8,342.6
	Transport	40,788.4	--	40,788.4
Cross-Sectoral		23,840.2	17,167.0	41,007.2
	Environment	23,840.2	17,167.0	41,007.2
Total		1,482,155.6	1,135,808.5	2,617,964.0

Source: Estimations by the Assessment Team on the basis of official information.

partially destroyed durable assets; (ii) **Losses**, which consist of changes in the flows of goods and services in the economy and include reductions in production and increases in expenditure that may arise as a result of the disaster; and (iii) **Recovery and Reconstruction Needs**, which are the financial amounts required to achieve recovery of the economy at macro-economic, sectoral, and personal or household levels, as well as the financing required to rebuild with disaster-resilient features in order to reduce future risk. The Human Recovery Needs Assessments (HRNA) measured, through qualitative and quantitative data, the micro- and meso-level impacts of a disaster on affected sectors and cross-cutting areas of gender, age (including infants, young children, adolescents, adults, and older people), environment, disaster risk reduction and governance).

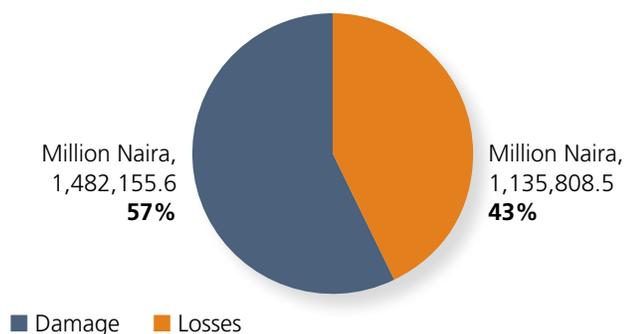
Estimated Value of Damage and Losses

The total value of destroyed physical and durable assets caused by the 2012 floods in the most affected states

of Nigeria has been estimated to have reached ₦1.48 trillion (Nigerian Naira), or its equivalent of US\$9.5 billion.³ The total value of losses across all sectors of economic activity was estimated at ₦1.1 trillion, equivalent to US\$7.3 billion. The combined value of these damages and losses is ₦2.6 trillion, or US\$16.9 billion (see Table ES-1). The overall impact of the flood on real GDP growth in 2012 is estimated at 1.4 percent (₦570 billion, in nominal terms). This estimation is based on the impact of production losses as a result of the floods in most sectors of the economy on real GDP growth in 2012.

From the above information, it is clear that the effects of the floods were concentrated most heavily on the destruction of physical and durable assets, the value of which represents 57 percent of the flood's total impact. Production losses make up the remaining 43 percent (Figure ES-1).

³ A weighted exchange rate for the year of ₦160 per US\$ was adopted on the basis of information provided by Nigerian authorities.

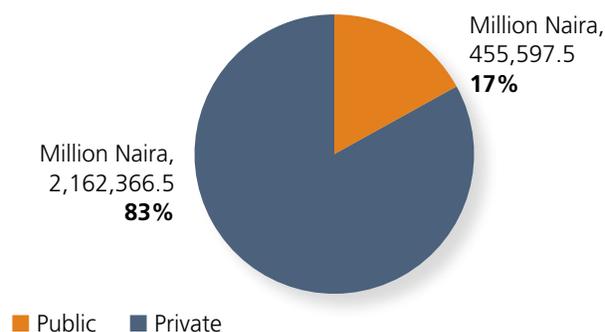
Figure ES-1: Breakdown of Total Flood Effects

Source: Estimations by the Assessment Team on the basis of official information.

The magnitude of the flood's effects may be gauged by noting that the value of destroyed assets represents 35 percent of the annual value of Nigeria's fixed gross capital formation (GFKF) for the year 2011, which in fact indicates that, if all other construction activities were stopped and the country's capacity were to be solely concentrated on reconstruction, it would take nearly three years to achieve full reconstruction of flood-destroyed assets. Furthermore, the value of production losses caused by the floods represents three percent of the value of all goods and services produced in the country in the preceding year. It may be concluded that the 2012 floods had a significant negative effect on the country's capital assets, and that this disaster may negatively affect overall economic performance, as further described in Chapter Two.

Another feature of the effects of the floods has to do with the ownership of the above-described damage and losses (Figure ES-2). The assessment reveals that flood effects were heavily concentrated (83 percent of total damage and losses) on private sector entities, including individual persons or families as well as private enterprises. The public sector, represented by federal and state-level governments, on the other hand, faced the destruction of assets in infrastructure sectors and higher costs in the provision of basic social services as well as in meeting unforeseen emergency expenditures that represent 17 percent of the total effects of the floods. This lopsided distribution in "ownership"

of disaster effects will have a bearing on the respective share of post-disaster recovery, reconstruction and risk-reduction activities, which impacts both public and private sectors. The government will continue to play a catalytic role in disaster recovery and the private sector will most likely assume a leading role in flood rehabilitation as well.

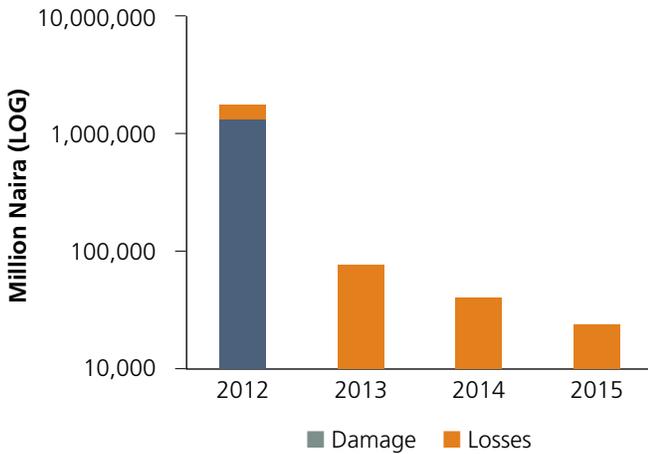
Figure ES-2: Breakdown of Total Flood Effects According to Private and Public Ownership

Source: Estimations by the Assessment Team on the basis of official information.

Time distribution of damage and losses

The PDNA reveals that, while the destruction of physical assets occurred during the time of the floods in the fourth quarter of 2012, production losses will have a much longer duration and their effects will spill over into 2013 and beyond. Until the destroyed assets are fully replaced or rebuilt and the basic services are restored, production will not recover to pre-disaster levels. As an example, one could consider that the drowning of domestic animals, which occurred in 2012, will result in losses in production of meat, milk and eggs from the time of death of these animals until their numbers reach the same level in three years' time, assuming the only replacement of animals is achieved through natural growth of the stock. Similarly, the production of mills and other agro-industries may not resume until the next harvest occurs in 2013 and their machinery has been replaced. Figure ES-3 shows the expected duration of flood effects. This topic is explored further in Chapter Three.

Figure ES-3: Time Variation of Damage and Losses Caused by the 2012 Floods in Nigeria



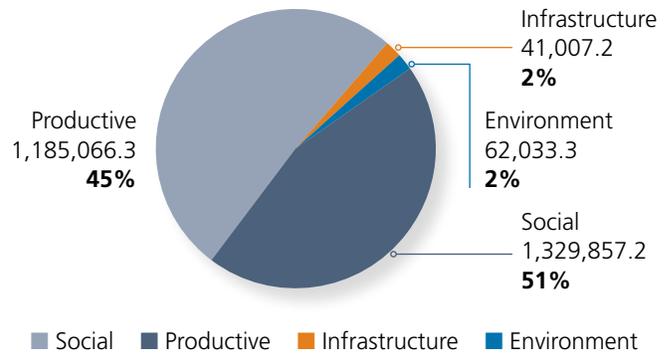
Source: Estimations by the Assessment Team on the basis of official information.

Sectoral Distribution of Damage and Losses

The distribution of flood effects among the main types of sectors of economic and social activity in the country reveals the special nature of this disaster. Indeed, there occurred a significant concentration of total flood effects in the social sectors—which include housing, education, and health—and in the productive sectors—including agriculture, oil production, manufacturing and commerce—while the flood effects on infrastructure sectors were relatively minor. The prevalence of these types of damage and losses can be explained by the extensive destruction of traditional housing units, schools, clinics, and associated facilities that had been constructed with no disaster-resilient features and were located in areas that are highly exposed to flooding. In addition, productive activities were also located in flood-vulnerable areas without any provisions for flood control (Figure ES-4).

An analysis of individual sectors of economic and social activity reinforces the sectoral distribution of damage and losses findings and provides elements for the assignation of post-disaster recovery activities, as well as for the introduction of disaster risk-reduction features in the near future. Evidently, the most affected

Figure ES-4: Breakdown of Damage and Losses among Main Sectors of Economic Activity

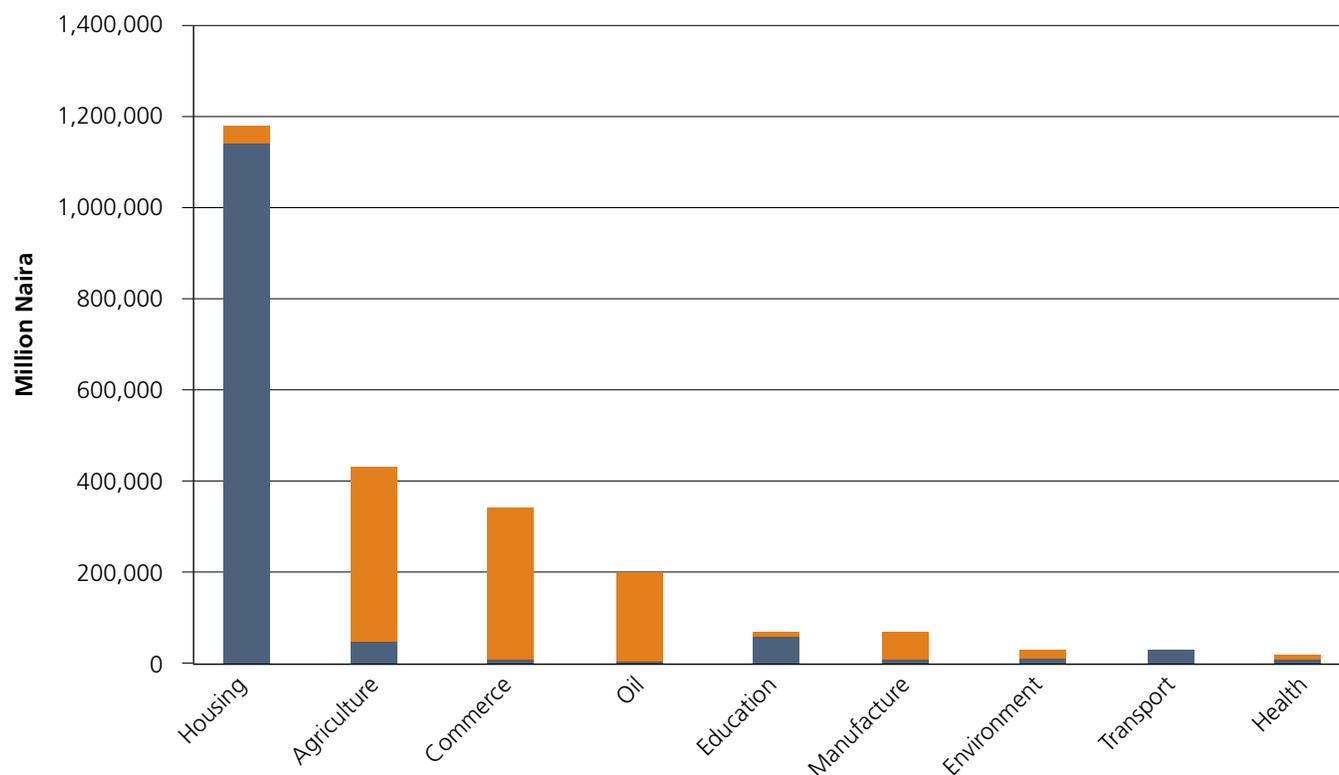


Source: Estimations by the Assessment Team on the basis of official information.

individual sector in terms of destroyed assets is that of housing (damage of over ₦1 trillion). The sector of agriculture, which comprises crop production, livestock raising and fishery, was the second-most affected, wherein the most important features of disaster effects are production losses (amounting to ₦380 billion) and the destruction of physical assets, at a cost of a further ₦100 billion. Third-most affected was the commerce sector (including wholesale and retail activities), which sustained destruction of its assets (premises and stocks of goods to sell) of ₦18.6 billion, as well as very large losses in sales (₦376 billion). The oil sector sustained damages to oil wells and suffered other associated infrastructure and production losses worth a combined total of ₦230 billion (Figure ES-5).

Geographical Distribution of Damage and Losses

The assessment covered the 12 most-affected states. The available data reveals that the states of Bayelsa (₦596 billion), Rivers (₦507 billion), and Anambra (₦484 billion) sustained, without a doubt, the greatest amount of damage and it was here that losses were highest. This may be explained by their geographical location, being situated in areas where the highest flood peaks

Figure ES-5: Breakdown of Damage and Losses among Individual Sectors of Economic Activity

Source: Estimations by the Assessment Team on the basis of official information.

and levels occurred, but also by their natural vulnerability and the absence of effective flood-control features. The states of Delta, Kebbi, Kogi, Taraba, Adamawa, and Nasarawa constitute the second-most affected set of states. Such conditions may be explained by their location downstream of the junction of the country's two main rivers and/or due to their proximity to the main river tributaries, which have extremely high rates of flow at different times during the fourth quarter of the year. The states of Edo, Jigawa, and Benue were significantly less affected in view of their location further from the main rivers (Figures ES-6 and ES-7). It is estimated that the other affected states not included in the assessment sustained lower values of damage and losses.

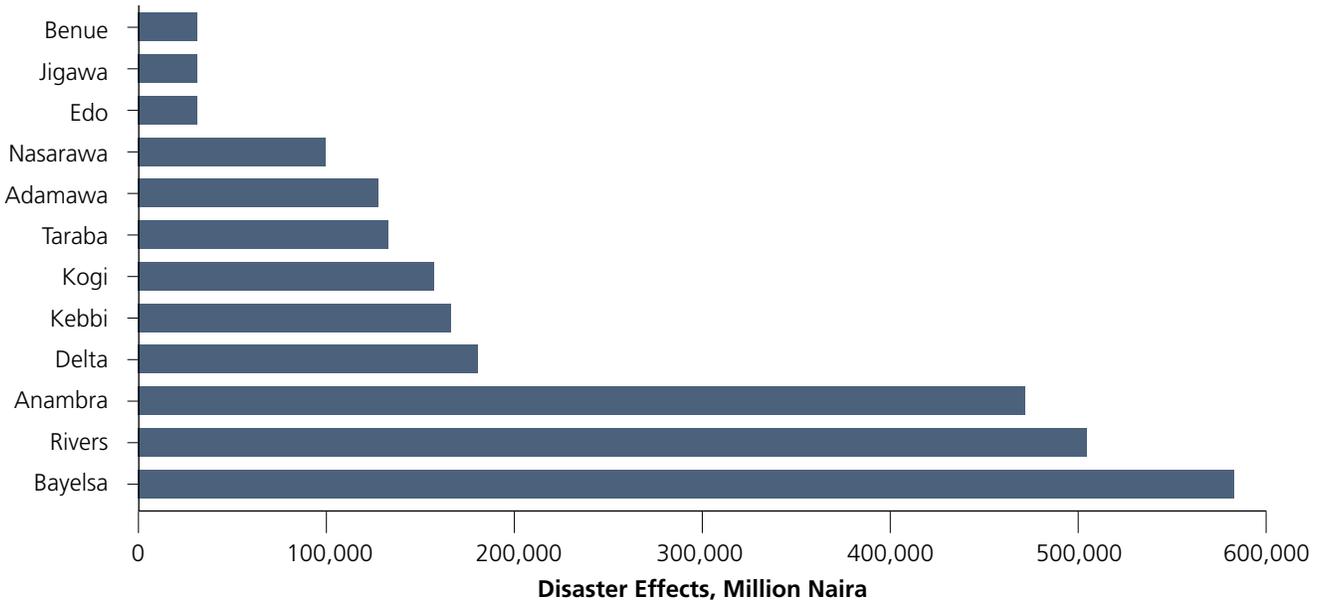
Per Capita Values of Damage and Losses

Taking into consideration information on the population, it is possible to obtain an idea of the personal

and household impact of the floods, which may serve as a basis for a subsequent analysis of personal and household income decline, as well as an input for defining priorities for recovery interventions. The analysis clearly reveals that residents of Bayelsa state were the most affected in the country, as they sustained per capita damage and losses of ₦293,400 (or its equivalent of US\$1,835 per capita). With the average person in Anambra sustaining per capita damage and losses of nearly ₦98,000, and that of Rivers roughly ₦80,000, these populations were thus the second-most affected by the floods. Inhabitants of the states of Taraba, Nasarawa, Kebbi, Kogi, Delta, and Adamawa sustained per capita effects between ₦35,000 and ₦50,000. In Edo, Jigawa and Benue states' per capita values were below ₦6,500 (see Figure ES-8).

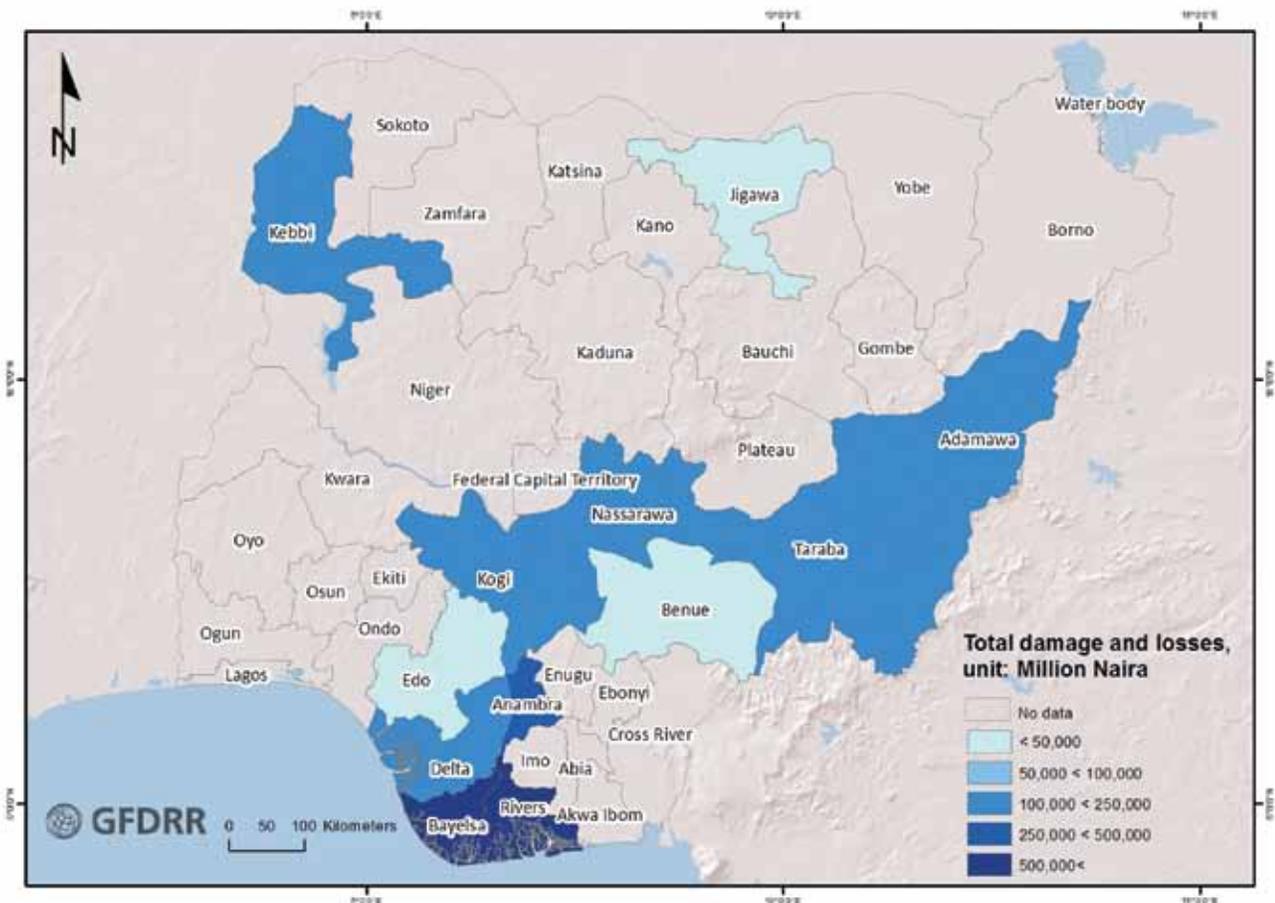
Figure ES-9 shows a geographical representation of the most affected per capita damage and losses, using the same information as the previous graph.

Figure ES-6: Spatial Distribution of Damage and Losses Caused by the 2012 Floods



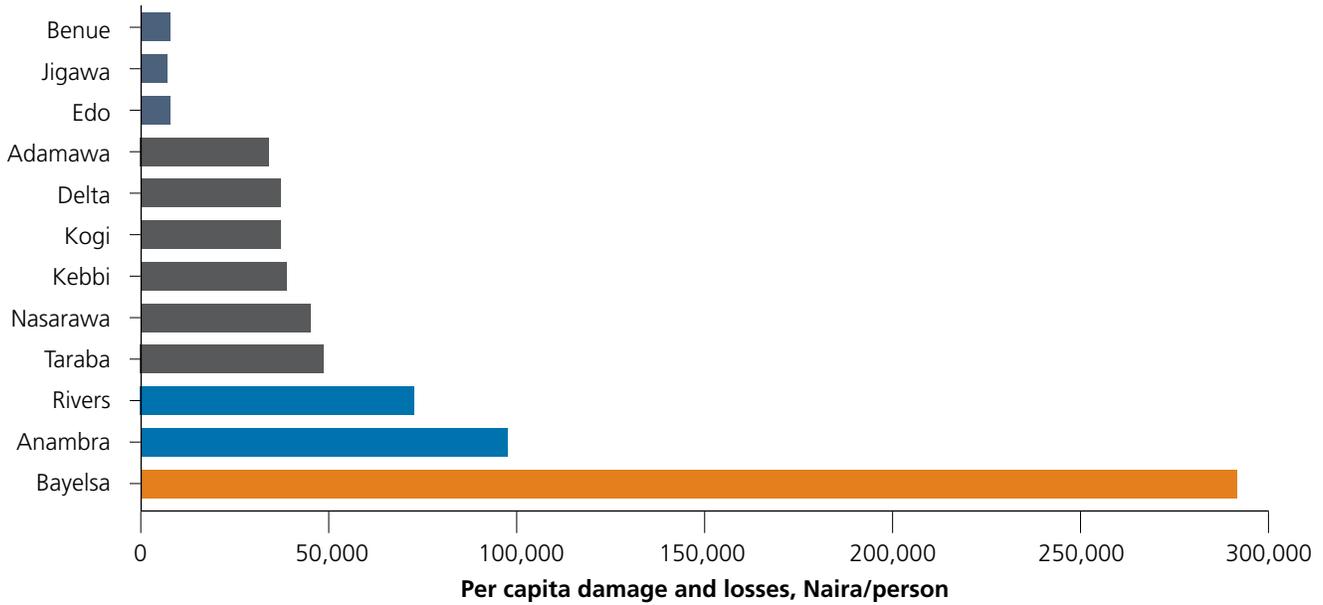
Source: Estimations by the Assessment Team on the basis of official information.

Figure ES-7: Map Showing the Most-Affected States



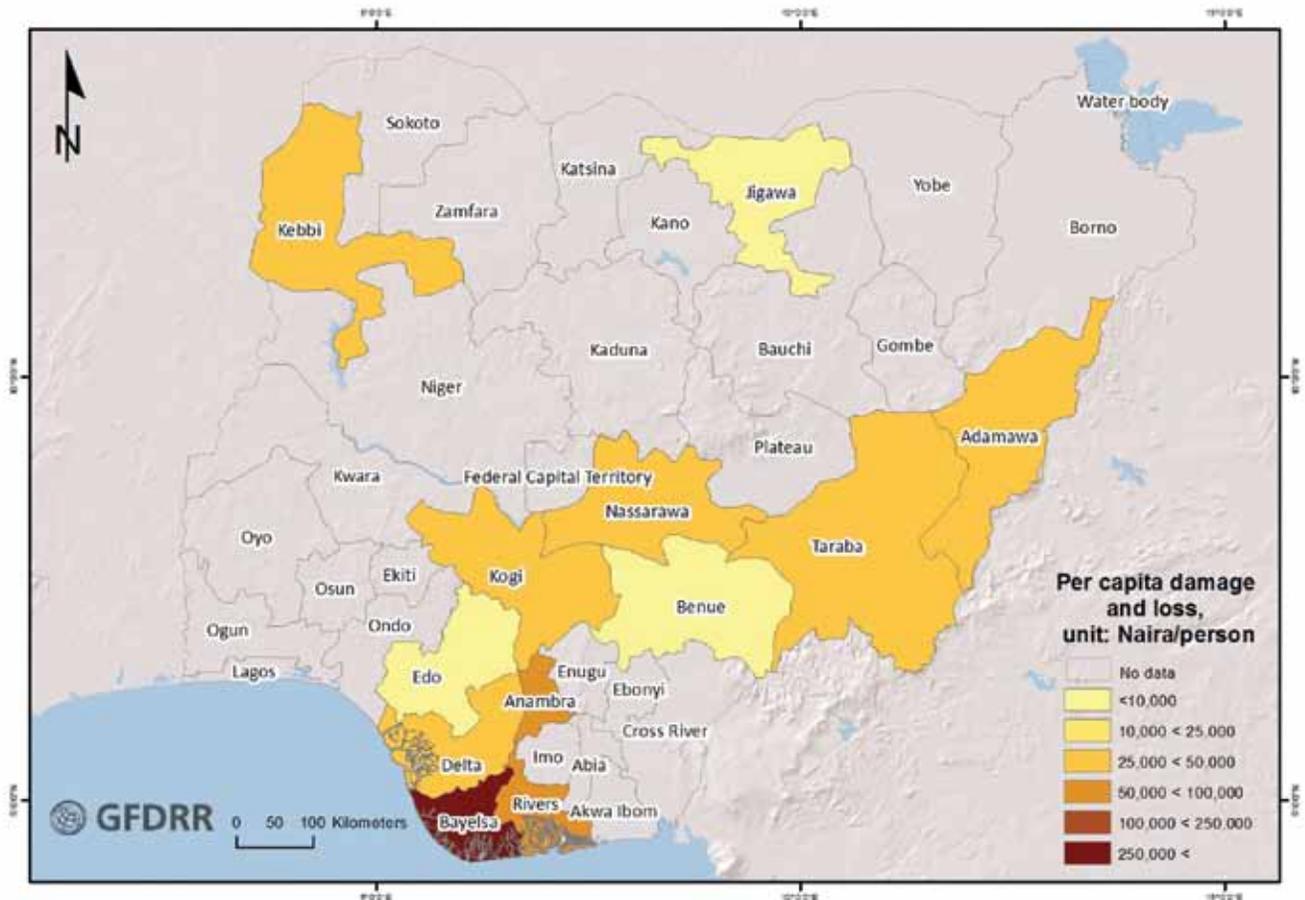
Source: Estimations by the Assessment Team on the basis of official information.

Figure ES-8: Spatial Distribution of Per Capita Damage and Losses by State



Source: Estimations by the Assessment Team on the basis of official information.

Figure ES-9: Map Showing the Spatial Distribution of Per Capita Damage and Losses by State



Source: Estimations by the Assessment Team on the basis of official information.

Relationship between Flood Effects and Human Development

The above-described values of per capita damage and losses were compared to the most recent values of the Human Development Index (HDI), as developed by United Nations Development Programme (UNDP) in cooperation with the Government of Nigeria.⁴ It was found that four states with an HDI below 0.5 (this represents where human development is lower in the country) sustained above-average values of per capita damage and losses. These occurred in the states of Anambra, Taraba, Kebbi, and Kogi. The results of the assessment are presented in Table ES-2.

Table ES-2: Per Capita Damage and Losses in Relation to Human Development Index

State	Per capita damage and losses, Naira/person	Human Development Index
Anambra	98,200	0.441
Taraba	50,000	0.361
Kebbi	41,700	0.388
Kogi	38,900	0.422

Source: Estimations by the Assessment Team using official information.

This finding should not come as a surprise, since the poor often live in areas that are more vulnerable to disasters of natural origin and thus face a higher disaster risk. This dictum is well known to disaster risk management practitioners throughout the world, though the quantitative information on which to base such a statement has often proved elusive. Furthermore, this evidence-based finding provides an indication that poverty numbers may have increased in the affected states as personal and household income declined, due to the production losses induced by the floods. This finding is further explored in Chapter Four.

⁴ See UNDP, *Human Development Report Nigeria 2008-2009*, Abuja, 2010.

Overall Economic and Personal Income Impact of the 2012 Flood

The flood affected several sectors of the economy; its overall impact on real GDP growth in 2012 is estimated at 1.4 percent (₦570 billion, in nominal terms). This estimation is based on the impact of production losses and of extraordinary spending after the disaster on real GDP growth in most sectors of the economy in 2012. Balance of payment projections for 2012 by the Central Bank of Nigeria (CBN) indicate that, prior to the floods, the current account balance was in surplus and was projected to improve by about 1.2 percent of GDP in 2012, mainly due to a projected increase in oil exports. However, in view of the losses associated with the flood, the current account surplus will improve by only about 0.6 percent of GDP in 2012.

The repercussion of the floods on inflation was mitigated by the government's efforts to address their short-term impact through the release of grains from the strategic food reserves and the distribution of high-yielding and flood-resistant grain varieties to affected farmers for mid-season planting, once the flood waters receded. Nevertheless, the average inflation rate is likely to remain in the double digits into 2013 but should trend downwards slightly compared to 2012 levels given the continued focus on fiscal consolidation by the federal government and the activist monetary policy stance of the CBN.

The current forecast of the floods' impact on the fiscal sector takes into consideration losses in tax revenues that could result from a decline in economic activities, as well as the corresponding increase in expenditure as a result of reconstruction activities. A decline of ₦280.6 billion is expected from the productive sectors, broken down as follows: ₦225 billion from the oil industry, ₦50.8 billion from the commerce subsector, and ₦4.8 billion from the manufacturing subsector. This may result in a ₦27.75 billion decline in tax revenue, or 0.07 percent of GDP in 2012.

Concerning equivalent employment losses and imputed personal income decline of workers in the pro-

ductive sectors—namely, agriculture, commerce, and manufacturing—the findings show that the workers lost a total of 27,602,524 working days in the agriculture sector, amounting to ₦9,917 million. Also, a total of 211,500 working days were lost in the trade SMEs, amounting to ₦93.9 million, while a total of 42,670,440 working days amounting to ₦28,418.5 was lost in micro-trade. The total number of working days lost in the manufacturing sector—including days lost by SME employees, days lost by microenterprise owners, and days lost by microenterprise workers—is 20,259,720, amounting to ₦16,904.0 million.

Estimates of Post-Disaster Recovery and Reconstruction Needs

General Considerations

After the values of destroyed physical assets and of production losses and the resulting macro-economic and household impacts have been estimated, it is possible to estimate the finances required to achieve recovery of the economy to at least pre-flood levels, as well as those needed to reconstruct destroyed assets using improved, disaster-resilient standards under a “building-back-better” strategy. From the outset, it must be indicated that requirements for economic recovery include the amounts of financing needed to ensure that private sector entities and individuals obtain sufficient working capital to re-initiate their productive activities and the amounts required by the government, at the federal and state levels, to meet the increased demands of current expenditures in the service sectors under its purview. In that sense, the value of recovery needs is usually a fraction of the value of production losses and higher costs of services that vary among sectors depending on their characteristics.

The needs for reconstruction, however, represent the amounts required to rebuild destroyed assets to meet improved standards of quality and modernization, the relocation of selected assets into safer areas, as well as the adoption of disaster-resilient norms to reduce risk. Thus, their value will often exceed those of the estimated value of damage, once these improved standards have been factored in.

Recovery and reconstruction needs refer to both the private and public sectors, as both were affected by the disaster and do not include any type of compensation from the government to the affected populations. Rather, the estimated needs represent the amounts of financing that are required to achieve recovery and reconstruction. Portions of these needs are to be provided as cash grants or in-kind donations to the poor, while others will be provided as soft-term credit (as appropriate under post-disaster conditions), channeled through development and private banks for affected credit-worthy individuals and private enterprises.

Full particulars on the estimation of post-disaster needs for economic recovery and disaster-resilient reconstruction are given in the *Guidance Notes for Conducting Post-Disaster Needs Assessment*, prepared by the World Bank’s Global Facility for Disaster Reduction and Recovery (GFDRR).⁵

Summary of Recovery and Reconstruction Needs

The total financial requirements for post-disaster economic recovery and disaster-resilient reconstruction in connection with the 2012 Nigerian floods have been estimated for all affected sectors of economic and social activity in the twelve most affected states. Human development recovery needs at the community level and disaster risk reduction (DRR) needs are to be added to these recovery and reconstruction requirements. A total amount of ₦1,138 billion (or its equivalent of US\$7.1 billion) is required to cover these needs. Of that amount, ₦253.8 billion (US\$1.6 billion) is required to ensure economic recovery in all affected sectors and ₦884 billion (US\$5.5 billion) more are required to finance disaster-resilient reconstruction of assets that were destroyed, as shown in Table ES-3. A combination of domestic funding and international support may be required to meet these financial requirements.

⁵ See *Damage, Loss and Needs Assessment Guidance Notes*, Volume 3, Global Facility for Disaster Reduction and Recovery (GFDRR), The World Bank, Washington, DC, 2010.

Table ES-3: Summary of Needs for Recovery and Reconstruction after the 2012 Floods in Nigeria's Most Affected States, million Naira

	Post-Disaster Needs	
	Recovery	Reconstruction
Social	131,069	744,444
Income generation	69,000	–
Housing	42,409	619,918
Health	4,449	23,568
Education	15,211	100,959
Productive	122,735	30,535
Agriculture crops	54,594	1,600
Livestock	22,538	–
Fishery	37,106	–
Manufacture	5,944	27,471
Commerce	2,553	1,464
Infrastructure		86,684
Electricity	–	337
Water and sanitation	–	18,432
Transport	–	67,915
Environment		22,567
Total	253,803	884,231

Source: Estimations by the Assessment Team on the basis of damage and losses.

Achieving disaster and climate resilience

Nigeria can strengthen flood risk management and protect human lives as well as property, infrastructure, and production of goods and services by adopting cost-effective strategies that focus on managing floods and integrating the concept of living with floods, protecting key assets, and minimizing losses. Recommendations to further strengthen Nigeria's flood disaster management capacity are presented below. A number of activities could be financially supported by the Dangote Flood Commission fund, existing government programs, and possible future financing from development partners, including the World Bank, Regional Development Banks, UN, and EU, or bilateral donors. Three major areas of investment have been identified: (i) Strengthen DRM and climate change adaptation; (ii) Build community resilience; and (iii) Ensure disaster and climate change resilience in key sectors. Spe-

cific actions and government agencies responsible are summarized in the Table ES-4. The total cost of achieving disaster resilience is estimated at ₦70,160 million (US\$438.5 million).

Transitional Recovery and Reconstruction Framework

The recovery and reconstruction process is an opportunity to build long-term disaster resilience. The objective of the recovery and reconstruction framework is to provide a sequenced, prioritized, programmatic, yet flexible (living) action plan to guide the recovery and reconstruction process. Successful recovery programs must ensure that all stakeholders work towards a common vision for recovery and longer-term resilience. Guiding principles help to align recovery objectives and the actions taken to reach them. Guiding principles can be broadly grouped under five categories, namely: strategy, implementation, governance, monitoring and

evaluation, and coordination. Furthermore, with the majority of damages and losses coming from just two sectors—housing and agriculture (52 percent and 22 percent of total damages and losses, respectively)—recovery of these sectors must be prioritized and properly sequenced while ensuring that other affected sectors are not left unaddressed and that recovery and reconstruction needs that have multi-sectoral implications

(such as the restoration of transport infrastructure) are given priority. The needs for recovery and reconstruction for all sectors, prioritized in three tiers, are summarized in Table ES-5. Implementation of priority one needs should begin immediately. Many of them will overlap with the implementation of tier two and tier three needs.

Table ES-4: Proposed DRM actions

Proposed Actions	Indicative Cost (million Naira)
1. Strengthen DRM and climate change adaptation	9,696
2. Build community resilience and invest in infrastructure	21,200
3. Ensure disaster and climate change resilience in key sectors	39,184
Total	70,160

Source: Estimations of the Assessment Team.

Table ES-5: Prioritized Needs for Recovery and Reconstruction for all sectors

Sector	Total Amount (million Naira)
Priority 1 for Recovery and Reconstruction	
Housing	662,328
Transport	62,313
Agriculture	114,238
Health	4,431
Education	15,211
Water supply and sanitation	18,432
Income generation	69,000
Commerce	1,869
Priority 2 for Recovery and Reconstruction	
Agriculture	1,600
Health	23,568
Education	100,959
Commerce	2,121
Manufacturing	4,611
Priority 3 for Recovery and Reconstruction	
Transport	5,602
Health	18
Electricity	337
Manufacturing	28,804

Source: Estimations of the Assessment Team on the basis of damage and losses.



Photo: World Bank.

CHAPTER 1: INTRODUCTION

1.1 Overview of 2012 Floods in Nigeria

The National Emergency Management Agency (NEMA) reported that heavy rains between July and October 2012 in the country led to an overflow of river discharge, aggravated by a breach of irrigation reservoirs and causing the destruction of roads, bridges and other infrastructure, ruining property, killing livestock, and leading to the temporary displacement of people whose homes were inundated. There was also a significant and sustained interruption of production activities. The disaster, which started as seasonal flooding in different parts of the country at the onset of the rainy season in April, suddenly became intensive in late August and mid-September. Unprecedented flooding was recorded in Adamawa, Anambra, and Taraba states. The North Central states of Nigeria were particularly hard hit, especially Kogi and Benue. Other states that were submerged by flood waters include Bayelsa, Edo and Delta, among others. Figure 1.1 shows selected images of the disaster in Adamawa state, while Figure 1.2 shows submerged housing units in Anambra state.

The impact of the 2012 flooding in Nigeria was devastating in terms of human, material and production losses (see Annex 1). As reported by NEMA in September 2012, many Nigerians were displaced, properties worth billions of US dollars were destroyed, and more than 207 individuals lost their lives. Access to health-care facilities was greatly disrupted and many schools had to be closed. An updated report by NEMA on November 15, 2012 indicated that in fact 363 people had been killed, 5,851 injured, 3,891,314 affected, and 3,871,53 displaced.

1.2 Nigeria's Social, Economic, and Political Context

Nigeria has a three-tier government structure: a federal government, state governments (and a federal capital territory that has the status of a state), and local government areas (LGAs). The democracy is built around

Figure 1.1: Pictures of Flood Disasters in Adamawa State



Source: Blueprint.com.

Figure 1.2: Submerged Housing Units in Anambra State



Source: Sahara Reporters.

a federal republic model, comprising the Executive, the Legislature, and the Judiciary branches, as defined by the *Constitution of the Federal Republic of Nigeria 1999*. Executive powers are vested in the President, who is the Head of State and presides over the Federal Executive Council (FEC), while legislative powers are vested in the National Assembly, made up of a 109-seat Senate and a

360-seat House of Representatives. Judicial powers rest with the courts, the highest of which is the Supreme Court of Nigeria; others are the Appellate Court and the Federal High Courts of Justice. The Federal Judiciary is headed by the Chief Justice of the Federation (CJN). The executive and legislative arms are elected by popular vote for a term of four years. State governments consist of an elected governor, deputy governor, and a directly elected State House of Assembly. A minister appointed by the President heads the Federal Capital Territory. The Federal Executive Council (FEC) is the highest decision-making organ of government and is supported by a federal civil service. The federal civil service has line ministries and parastatals principally responsible for implementing the policy decisions of the FEC. The Secretary to the Federal Government (SGF) is the secretary of the FEC. The Federal Legislature is bi-cameral, consisting of a Senate (members of which are elected on the basis of equality of states), and a Federal House of Representatives, (where members are elected on the basis of population size).

At the state level, the Executive Council (SEC) is composed of the Governor and State Commissioners. The SEC's policy decisions are implemented by a supportive state civil service, composed of line ministries and parastatals. The Secretary to the State Government (SSG) is the secretary of the SEC. The State Legislature is unicameral, having only a House of Assembly, to which members are elected on the basis of population. The State Judiciary is made up of High Courts of Justice, Magistrate Courts, and the Customary Courts. The State Judiciary is headed by the State Chief Judge (CJ). At the Local Government Area (LGA) level, the executive (LEC) is composed of the Chairman and Supervisory Councilors, supported by an LGA civil service. The LGA Legislature is unicameral, being composed of an LGA Legislative Council made up of councilors elected on population basis.

The security of lives and property and corruption are the main social issues confronting Nigeria. Corruption is said to have eaten deep into the fabric of the Nigerian economy, as it not only truncates economic growth but also creates a negative impression of the country in the comity of nations. However, the federal government is making a tremendous effort to fight corrup-

tion, especially with the help of institutions established for this specific purpose, namely the Independent Corrupt Practices Commission (ICPC) and Economic and Financial Crimes Commission (EFCC).

Population and Poverty

Nigeria is the most populous country in Africa, with population of 160 million people. Although the Nigerian economy is growing, the proportion of Nigerians living in poverty is increasing every year and poverty is widespread. In 2004, Nigeria's relative poverty measurement stood at 54.4 percent, but increased to 69 percent (or 112,518,507 Nigerians) in 2010 (NBS 2010). The North West and North East geo-political zones recorded the highest poverty rates in the country, with 77.7 percent and 76.3 percent respectively in 2010, while the South West geo-political zone recorded the lowest, at 59.1 percent.

Nigeria's Economic Profile

Available data on Nigeria's economy shows that the primary production activities of agriculture and mining and quarrying (including crude oil and gas) account for around 65 percent of the real gross output and provide over 80 percent of government revenues. In addition, primary production activities account for over 90 percent of foreign exchange earnings and 75 percent of employment. In contrast, secondary activities such as manufacturing and building and construction—which traditionally have greater potential for broadening the productive base of the economy and generating sustainable foreign exchange earnings and government revenues—account for a mere 4.1 percent and 2.0 percent of gross output respectively. The low income-earning labor force constitutes about 39.6 percent of the population, with women making up less than 37 percent of that force. Notably too, traditional agriculture, the service sector, and trading remain the main generators of primary income. Nigeria reportedly is pursuing the ambitious goal of becoming one of the top twenty economies in the world by 2020. GDP growth in Nigeria was estimated at 5.5 percent in 2010 and is expected to remain strong in the coming years. According to the Economist Intelligence Unit (EIU), GDP

growth in Nigeria will average 6.5 percent between 2010 and 2015. This growth will be driven by an increase in oil production, largely supplied by offshore production wells, as well as by a commitment from the Federal Government to emphasize much-needed infrastructure improvements in the coming years. The expenditure on the gross domestic product (GDP) stood at ₦37,936,747.89 million in 2011 from ₦34,494,582.71 million, ₦25,236,056.37 million, ₦24,665,244.17 million and ₦20,940,910.90 million recorded in 2010, 2009, 2008, and 2007, respectively. The annual rate of inflation is now projected at 10.5 percent.

Nigeria has one of the fastest growing telecommunications markets in the world, with major emerging market operators (such as Mobile Telephone Network (MTN), Etisalat, Airtel, and Globacom) establishing their largest and most profitable centers in the country. The government has recently begun expanding this infrastructure to space-based communications. Nigeria has a space satellite that is monitored at the Nigerian National Space Research and Development Agency (NASRDA) Headquarters in Abuja. Nigeria also has a wide array of underexploited mineral resources, which include natural gas, coal, bauxite, tantalite, gold, tin, iron ore, limestone, niobium, lead and zinc. Despite having huge deposits of these natural resources, the mining industry in Nigeria is still in its infancy. Main cottage industries around the country produce confectionery, woodwork, leather, textile and plastic products.

1.3 First Responses by Government and Development Partners to the Flood Disaster

The 2012 flood disaster that ravaged many states in Nigeria drew responses from the public, federal, state and local governments, civil society organizations, and international development partners. The responses were generally in the form of immediate humanitarian assistance, spontaneous recovery, and organized recovery.

At the onset of the disaster, the State Emergency Management Agencies (SEMA), the National Emergency

Management Agency (NEMA), civil society organizations such as the Red Cross, along with international development agencies—particularly the World Bank and the United Nations working with the Office for the Coordination of Humanitarian Affairs (OCHA)—provided emergency humanitarian assistance to the affected population. Some humanitarian responses include the following:

- Immediate evacuation of the affected population away from flooded areas;
- Relocation of the affected population (Internally Displaced Persons - IDPs) in temporary shelters/accommodation, mainly schools and other public buildings;
- Provision of non-food items (NFIs) such as mats, blankets, and bedding to the affected population;
- Provision of food, medical and other humanitarian assistance;
- Re-opening of roads to link the towns/settlements that were cut off; and
- Erection of temporary shelters, at higher grounds, by the affected people themselves.

For example, the International Federation of Red Cross and Red Crescent Societies distributed non-food and emergency shelter items (buckets, blankets, sleeping mats, jerry cans, tarpaulins, shelter kits) to a total of 11,977 beneficiaries; conducted sensitization campaigns in 11 targeted states (Adamawa, Taraba, Plateau, Benue, Kogi, Niger, Edo, Anambra, Delta, Bayelsa, and Rivers) in an effort to prevent epidemics and promote better health; distributed 2,245 mosquito nets to 15 communities located in Edo, Kogi, Jigawa, Katsina, and other states; mobilized and distributed 338 Low Flow Dispensary filters (for hand washing) in Illushi, Ifeku Island, and Udaba communities (Edo state); distributed 8,926 pieces of soap in nine states as well as 7,608 Aquatabs in six states, among others (IFRC 2012).⁶

⁶ International Federation of Red Cross and Red Crescent Societies (IFRC). 2012. Emergency Appeal: Nigeria Floods.

Some of the schools in the affected areas that were situated in relatively safe locations were eventually used as temporary camps for Internally Displaced Persons (IDPs). Clinics were established in IDP settlements. Also, measles vaccination campaigns were carried out in IDP settlements and IDPs received long lasting insecticidal nets, household water filters, and basic water kits. The federal government subsequently announced the immediate closure of affected roads and the diversion of traffic to alternative routes, such as Ilorin-Jebba-Mokwa Road for southwest/northern-bound motorists and the Makurdi-Lafia-Akwanga-Abuja Road for the south-east/northern-bound vehicular traffic, and vice versa. The government further embarked on the immediate construction of a bypass road to the flooded Abuja-Lokoja highway. The Federal Ministry of Agriculture and Rural Development, as part of the federal government's food relief program meant to cushion the effect of the flood disaster, distributed 40,000 metric tons of assorted foods in the country's different states.

In tackling the immediate negative effects on education, a number of states temporarily integrated pupils from schools affected by flooding into other schools. In other cases, the state governments provided alternative buildings or rented accommodations for schooling. To identify schools that had been affected and possible actions to be taken, some states initiated the formation of flood relief distribution committees in the state Ministries of Education. Also, some state governments released funds for the fumigation of affected school buildings to avert disease outbreaks. In addition, some non-governmental organizations contributed to the education response. The United Nations Children's Fund (UNICEF) provided school tents, plastic chairs, mats, and tables for the establishment of temporary learning spaces and equipped them with teaching, learning, and recreational materials.

Furthermore, President Jonathan declared the 2012 floods a national disaster in a nationwide broadcast, during which he announced the setting aside of ₦17.6 billion (roughly US\$110 million) as direct cash aid to affected states. In addition, a Committee on Flood Relief and Rehabilitation was inaugurated. The Chair-

man, a highly respected industrialist, has pledged that the committee has set for itself a target of raising ₦100 billion from the public and private sectors to assist the government in dealing with the effects of the floods. Affected states have also set up special committees.

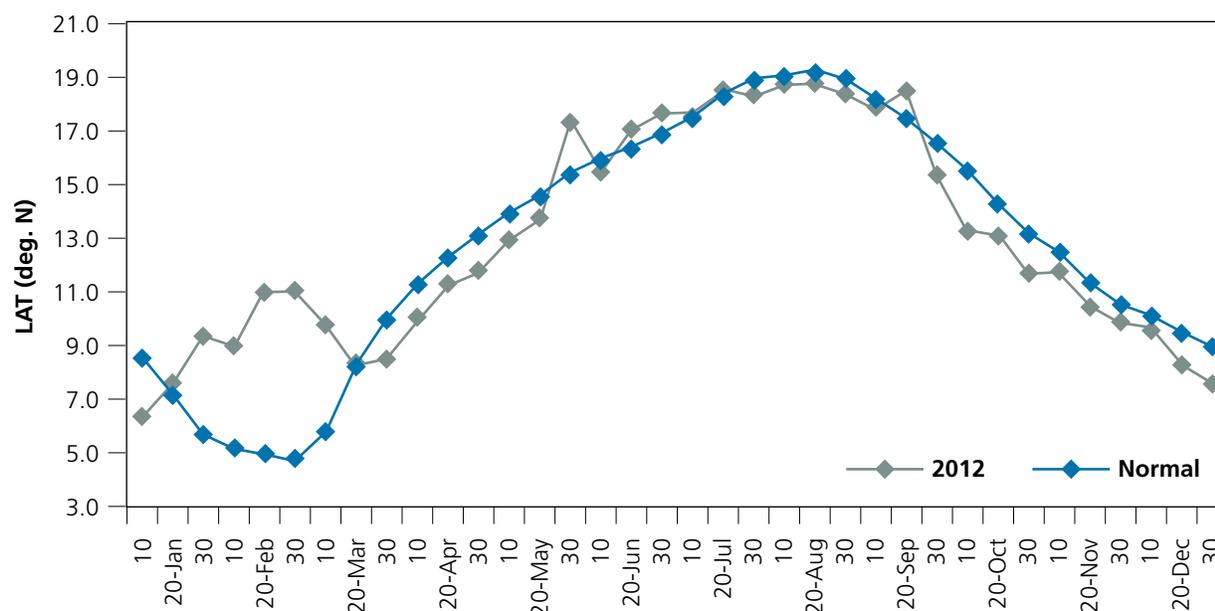
Furthermore, the federal government contacted experts on disaster management through the World Bank, the United Nations, and other organizations to train Nigerians in the modalities of conducting a Post-Disaster Needs Assessment (PDNA), to assist the country in achieving recovery and reconstruction. The training sessions were conducted by experts from the aforementioned organizations, under the supervision of NEMA. Trainees were then sent to the various states affected by the disaster to collect available information concerning its effects.

1.4 Hydro-Meteorological Analyses

1.4.1 Nigerian Weather Conditions in 2012

Synoptic features indicated dominance of the subtropical high-pressure systems at the beginning of the year, leading to the rising of dust particles to the surface of the Sahara Desert and their subsequent transportation toward the south, resulting in the reduction of horizontal visibility across the country. The southwesterly winds gained momentum at the coast and progressively moved inland at the end of the first quarter of the year. The monsoon trough remained very active across the country until the end of the third quarter, which brought about enhanced rainfall and thunderstorms, flash flooding, and its associated impact.

The Inter-Tropical Discontinuity (ITD), which is the line where dry and moist winds meet, maintained an average position of latitude 7.2°N in January and moved northwards thereafter to latitude 11.1°N by the end of February, instead of taking a climatologically southward movement. This development contributed to February's destructive storm over Lagos and adjoining areas in Ogun state. From March 2012, the ITD commenced its seasonal northward movement and reached the north limit of latitude 18.8°N in the second dekad of August, retreating southwards to attain an average position of latitude 7.6°N in December (see Figure 1.3).

Figure 1.3: ITD Positions in 2012

Source: NIMET 2012.

Maximum temperatures in the hot season (February and March 2012 in the south, and March and April 2012 in the north) were 0.5 to 2.5°C warmer than normal in the north, but remained normal in the south except over the extreme southeast, where temperatures were 0.5 to 1.5°C cooler than normal. The cold season (January) temperatures were normal in most places across the country. However, a few places (such as Sokoto, Katsina, Jos, Ilorin, Iseyin, Oshogbo, Akure, Benin, Owerri, and Enugu) experienced 0.5 – 3.2°C colder conditions.

1.4.2 Rainfall Conditions in 2012

Annual rainfall information has been available in selected rain stations located throughout Nigeria since 1981 and remains consistent over the past 32 years. This information was used to ascertain the possible return period of the 2012 rainfall event, using a Gumbel distribution. Based on such information, the 2012 rains have a return period of between 10 to 18 years (see Table 1.1). It should be noted that the integrated return period for the whole basin, which it was not possible

Table 1.1: Estimation of Return Period for 2012 Annual Rainfall in Selected Stations in Nigeria

Location	Item	August	September	October	July to Oct.
Lokoja (32 years)	Average (mm)	198.7	215.6	130.5	617.9
	YR 2012 (mm)	180.5	148.4	209.9	922.1
	App. Return Period (Years)	2	1.2	9	10
Yola (30 years, data missing for YR 2007-08)	Average (mm)	209.9	162.8	56.2	609.6
	YR 2012 (mm)	209.8	189.5	67.2	623.8
	App. Return Period (Years)	2.3	3	3	2.7
Makurdi (32 years)	Average (mm)	230.6	215.8	122.9	753.7
	YR 2012 (mm)	174.3	290.7	232.7	995.6
	App. Return Period (Years)	1.4	9	14	18
Enugu (32 year)	Average (mm)	255.5	284.0	209.0	1,013.6
	YR 2012 (mm)	309.1	393.2	227.7	1,318.0
	App. Return Period (Years)	4	13	3	15

Source: Estimations by the Assessment Team based on official information.

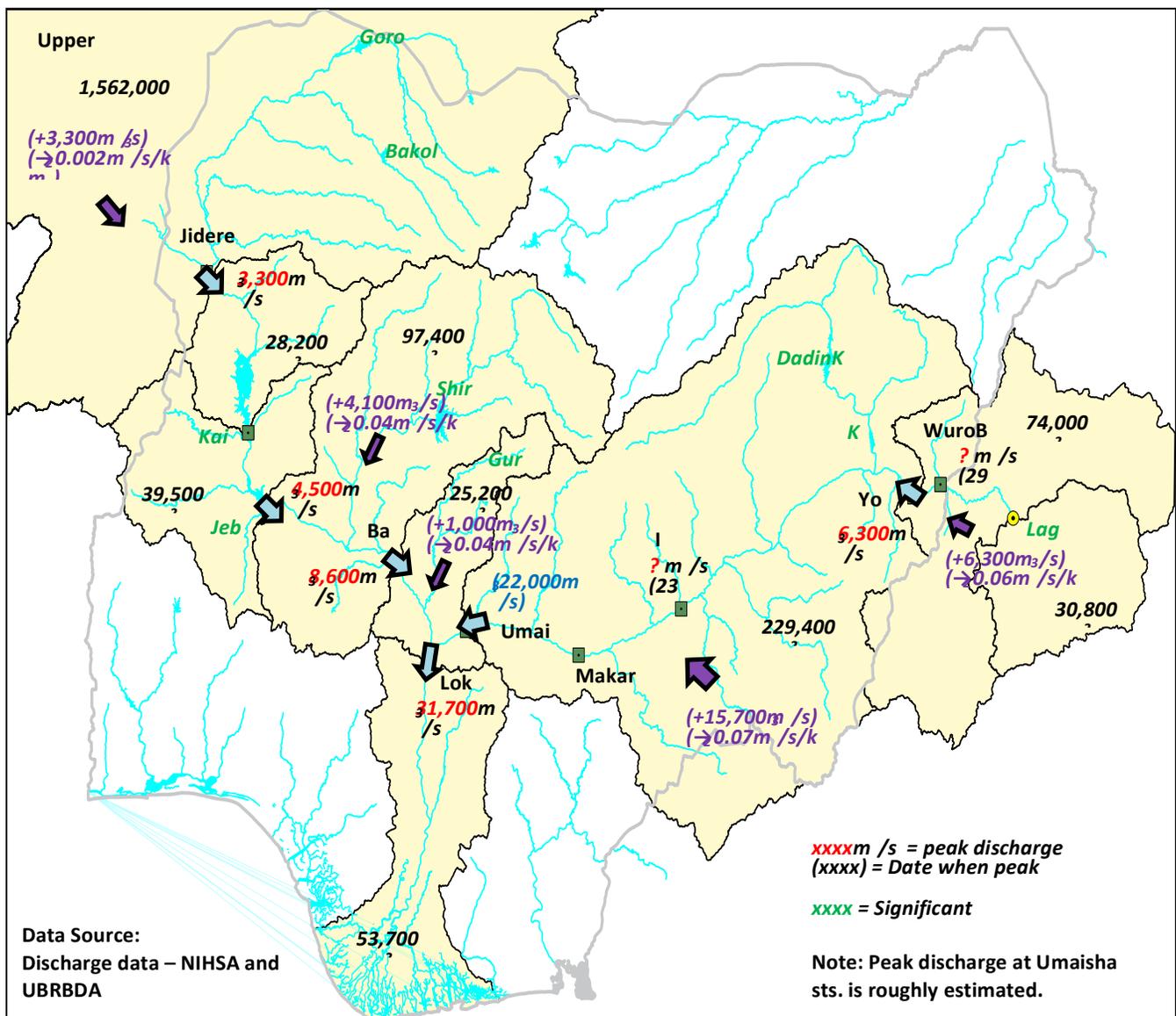
to calculate due to lack of information, can be much higher than those for each location.

1.4.3 Runoff and Peak River Discharge in 2012

Discharge data from the Nigeria Hydrological Service Agency river gauging stations was analyzed to define the timeline of peak river discharge at key locations along the country’s three main rivers. The following map (Figure 1.4) shows the peak discharge rates and the dates on which they were recorded at the gauging stations indicated on the map.

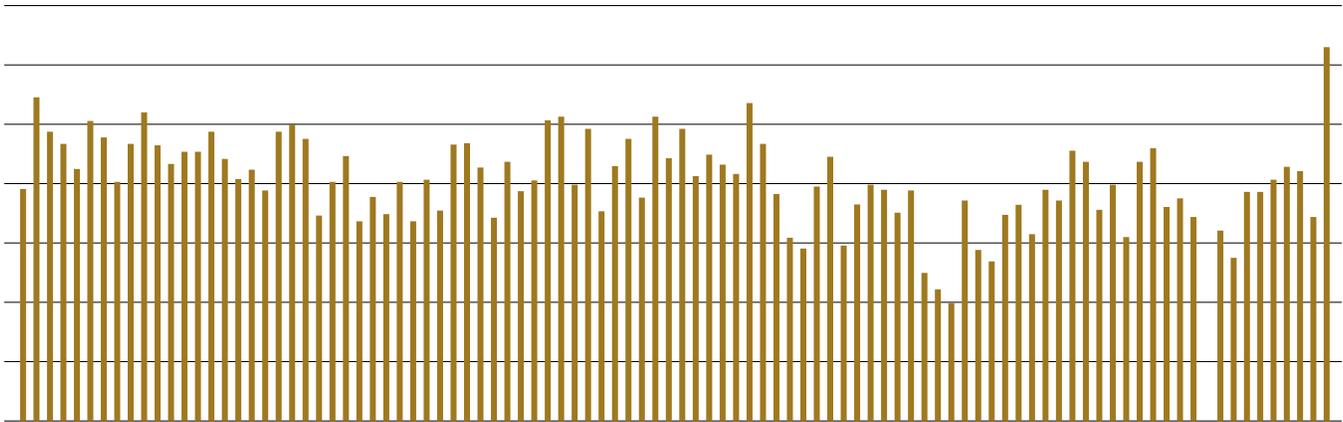
Figure 1.5 shows the values of annual peak discharge measured at Lokoja, Kogi state, from 1914 to 2012. It may be observed there that the annual peak discharge decreases after the 1970s, which could be explained as the result of the various dams, such as Kainji, Jebba, and Lagdo (in Cameroon) that were built in the 1960s. The possible effects of these dams might have been taken into account if data on the in/out flow and other variables used for the operation of the dams were available.

Figure 1.4 Peak Discharge Distribution Using Data from River Gauging Stations across Nigeria



Source: Estimations by the Assessment Team based on official information.

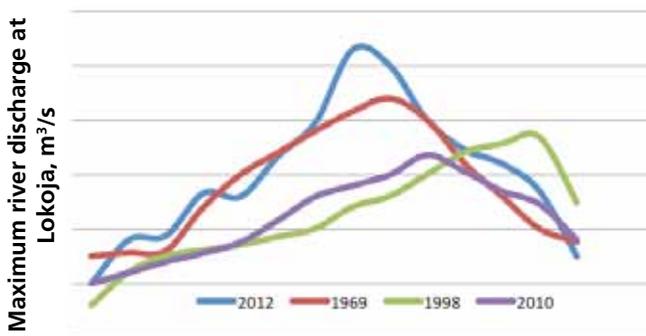
Figure 1.5. Annual Peak Discharge Recorded at Lokoja, Kogi State, between 1914 and 2012 (values given in cubic meters per second)



Source: Estimations by the Assessment Team using official information.

Figure 1.6 shows a hydrograph of the four highest peaks of river flow that have been documented at Lokoja, Kogi state, to illustrate the fact that the peak annual value of 2012 is the highest ever recorded at that location.

Figure 1.6: Maximum Daily Discharge Recorded at Lokoja, Kogi State for the Four Most Recent Flood Events



Source: Estimations by the Assessment Team using official information.

1.5 PDNA Process and Methodology

1.5.1 PDNA Process

In response to the government of Nigeria’s request, a PDNA training exercise was conducted from November to December 2012. The exercise aimed to assess the impact of the floods (including its financial implications) and to develop a strategy for recovery, from

restoration of services to complete rehabilitation and reconstruction of infrastructure, livelihoods, and economy, while ensuring future flood resilience. Its main objectives were to:

- Estimate the overall impact of the 2012 floods on the socio-economic development of the country at the national, state, and local levels;
- Assess the damage, losses, and human impact of the disasters to develop a Recovery and Reconstruction Framework presenting the early-, medium- and long-term recovery and reconstruction needs together with costs and a timeline in one consolidated report;
- Ensure that strategies for recovery integrate concepts of disaster risk reduction and “build back better” and address gender and environmental concerns;
- Recommend and define a strategy for Disaster Risk Management in the country;
- Recommend institutional mechanisms and policy options in support of the recovery and reconstruction process that promote long-term disaster resilience;
- Consult equally with women and men of all ages in order to understand their distinct experiences of the disaster, as well as their specific needs and priorities for reconstruction and recovery.

The PDNA exercise was led by the government of Nigeria under the oversight of the Presidential Committee on Relief and Rehabilitation.

The PDNA assessment process included following main phases: (i) training, (ii) the formation of multisectoral team, (iii) preparatory and desktop review, (iv) analytical work and sector strategic review, (v) consultations and survey for human needs assessment, and (vi) final consultation and report writing. These activities are briefly described below.

(i) Training: The overall mission of the PDNA orientation and exercise was to train relevant state and federal officers in undertaking a PDNA in response to the 2012 floods. It was expected that all relevant government officers from affected state and federal line ministries would attend the sessions. It was also meant to serve as an orientation for the 2012 assessment, defining roles and responsibilities, covering data collection and verification methods, and discussing next steps.

A first training and orientation event was held November 5–7, 2012. More than 100 state and federal government staff attended, as did UN and World Bank representatives. More than 20 state officers participated, representing the states of Abia, Benue, Imo, Zaira, Plateau, Jigawa, Niger, Bauchi, Ebonyi, Lokoja, Nasarawa, Kogi, Ebonyi, Lagos, Anambra, Jalingo, Kaduna, Yola, Kano, and Imo. Opening remarks were read by the Director General of NEMA, followed by a word from the UN Resident Coordinator as well as from the acting World Bank Country Manager. The training was meant to provide participants with a solid understanding of the PDNA methodology, the importance of undertaking disaster risk reduction, and the modes and purpose of sectoral assessments. Two additional training sessions were held on November 13 and 16, attended by 80 and 69 participants, respectively. These subsequent training sessions were intended for officers from sectoral ministries having been nominated to participate in the PDNA exercise. Training agendas and a complete list of participants of the various training sessions are provided in Annexes 3 and 4.

(ii) Multisectoral Team formation: A national, multisectoral PDNA team was formed in Abuja. In the role of coordinator, NEMA provided overall direction and was supported by Heads of Agencies from the United Na-

tions (UN) system, the World Bank (WB), and the European Union (EU). The exercise was coordinated by the PDNA Management and Technical Committee, which had representatives from the Government and three development partners providing daily guidance and technical oversight (see Figure 1.7). The PDNA exercise benefitted from the support of many sectoral ministries and agencies such as the Ministry of Environment, Ministry of Finance, and the Planning Commission. See Figure 1.7 and Annex 2 for more details.

(iii) Preparatory and desk review: Initial desk reviews were undertaken by the PDNA team to collect pre-disaster baseline information, determine the scope of the respective sector-wide reviews, identify information gaps, prepare damage and loss data collection templates, and identify and rapidly hire field data collection consultants. To begin with, desk reviews were carried out to analyze and compile all available pre-disaster baselines information for the various sectors, to identify gaps in baseline data, and to also identify various data sources for the collection of both baseline and damage and loss data;

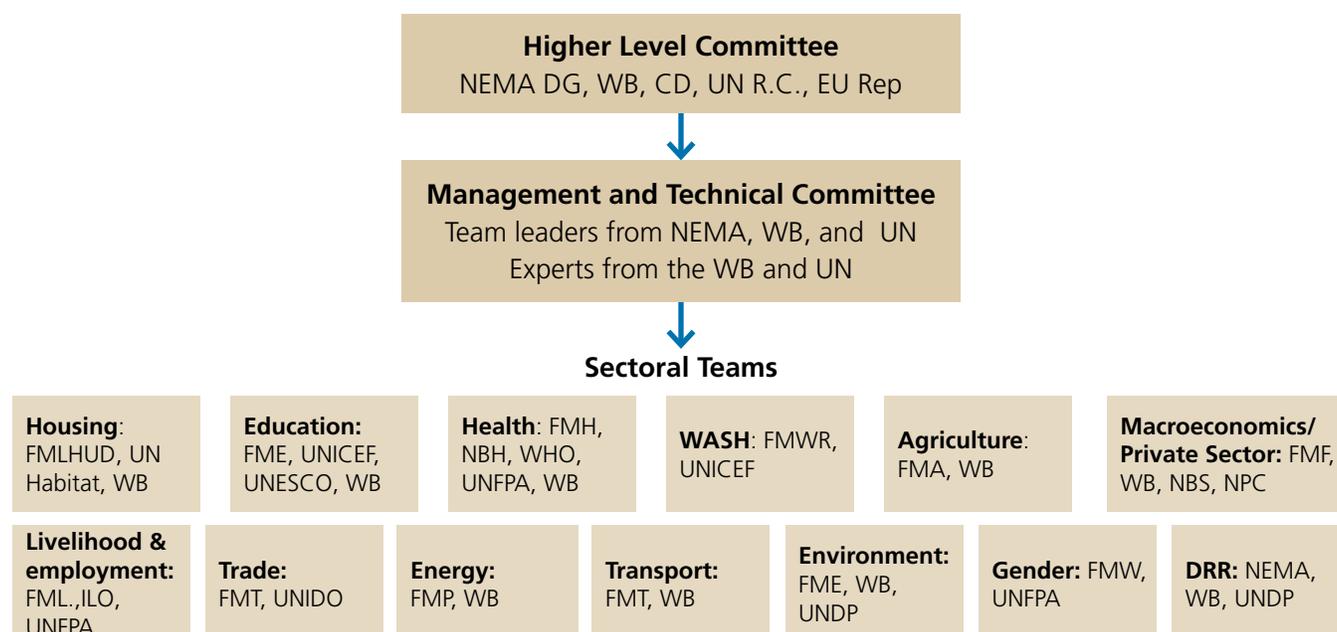
(iv) Analytical work and sector strategic reviews: When most of the damage data was available, sector teams visited the affected areas to consult with state and local government authorities, public/community representatives, NGOs, UN agencies, and other stakeholders, as well as examine the extent of the damage and begin collection of production loss information. The teams subsequently reviewed the data provided by the states to assess the extent and quality of data available. This was followed by review and analysis of the data by sectoral/core teams to prepare the draft sector reports including damage, losses, impacts and post-disaster needs. The macro-economic and human development expert team then aggregated the sector specific results into the macro-economic analysis and human development impact write-up.

(v) Consultations and survey for human needs assessment: As part of the PDNA process, a stand-alone community consultation and validation survey (Annex 5) was conducted between November – Decem-

ber 2012 that covered over 4,000 households in 54 sampled LGAs and more than 308 settlements in 13 states spread over all the geo-political zones of Nigeria: North-Central Center zone (Kogi and Niger states), North-West Center zone (Zamfara and Jigawa states),

North-East Center zone (Adamawa and Taraba states), South-East Center zone (Anambra and Imo states), South-West Center zone (Ogun and Oyo states), and South-South Center zone (Rivers, Bayelsa and Delta states). This survey, the first to be undertaken in con-

Figure 1.7: Multi-sectoral PDNA Team



Source: Assessment Team.

Table 1.2: Timeframe for the Assessment

Activity	Time period (2012-2013)
Mobilize sector teams	November 1-16
Orientation training on PDNA methodology	November 5-16
Data collection and field visits	November 12-23
Community consultation and validation survey commenced	November 18
Data analysis and initial findings	November 24-27
Needs assessment and prioritization	November 28-30
Draft sector reports submission (from sector teams)	December 8
Presentation of sectoral findings to federal government	December 20
Finalization of sector annexes and draft report	February 20
Finalization of report based on comments from MDAs	February 27
Presentation of full report to the national government	March 8
Printing and dissemination of full report	March 20

Source: Based on the timeframe adopted by the Assessment Team.

ducting a PDNA in Africa, generated much of the evidence base for assessing human recovery needs.

(vi) Final consultations and report writing: Upon completion of data collection and analysis, the sector teams wrote individual sector reports and held cross team consultations and consultations with key stakeholders were held to prioritize recovery strategies and costs. Other detailed work, such as ensuring that cross-cutting issues were addressed, was also carried out.

1.5.2 Assessment Methodology

Under the **DaLA methodology** conceptual framework, the following disaster effects are measured during an assessment:

- Damage is the value of physical, durable assets that may be destroyed due to the action of the natural hazard that caused the disaster, expressed in terms of the replacement value of the assets assuming the same characteristics that they had prior to the disaster; and
- Losses or changes in the normal flows of the economy that may arise in all sectors of economic and social activity due to the external shocks brought about by the disaster, until full economic recovery and reconstruction has been achieved, and are expressed in current values.

The following disaster impacts are also estimated as part of the assessment:

- Possible macro-economic growth decline due to losses inflicted by the disaster, including possible slowdown of gross domestic production, deterioration of the balance of payments and of fiscal sector position, as well as increase in inflation.
- Decline in personal or household living conditions, livelihoods, and income, possible increase in cost of living, as well as poverty aggravation arising from the losses caused by the disaster.

Financial needs for economic recovery and disaster-resilient reconstruction constitute the third output of the assessment, and include:

- Requirements for the immediate recovery of personal or household income, rehabilitation of basic services, and reactivation of productive activities; and
- Requirements for the reconstruction of destroyed assets with improved, disaster-resilient standards under a “building-back-better” strategy.

The **Human Recovery Needs Assessment (HRNA)** methodology enables:

- Identification of socio-economic impacts of the disaster at the human and community levels;
- Estimation of the decline in human development, expressed by the quantification of the human development index (HDI), arising from the disaster’s effects and impact;
- Estimation of possible setbacks in the achievement of the Millennium Development Goals (MDGs) for the affected country that may result from the disaster; and
- Estimation of needs to achieve human recovery at the personal and community levels.

These methodologies complement one another and provide a complete view of the human and economic requirements for achieving recovery and reconstruction. In the Nigeria floods assessment, sectors of economic and social activity that are included in the country’s system of national accounts—which may sustain either destruction of physical, durable assets and/or modifications to the normal flows of the economy caused by the disaster—were duly analyzed.

The following sectors of economic activity were individually included in the analysis, as defined in the Nigerian system of national accounts:

- Agriculture (food crops)
- Livestock
- Fishery
- Manufacturing industry
- Commerce
- Oil industry
- Electricity

- Drinking water supply and sanitation
- Transport and communications
- Housing
- Education
- Health and nutrition

In addition, several cross-sectoral activities, such as the environment, gender impact disaggregation, and others were also analyzed in full to ascertain possible social and economic effects and impacts.

1.5.3 Geographical Scope

In view of prevailing limitations in terms of both time and resources and given certain security concerns, it was not deemed feasible to conduct a detailed flood impact analysis for all of the country's affected states. Instead, the Assessment Team identified twelve states in which a full assessment would be conducted, thus covering the bulk of the flood's impact. At a later date, the same type of assessment could be carried out to cover those states that were not initially included in the process. The 12 states classified as highly affected states (Figure 1.10) are Adamawa, Taraba, Kebbi, Benue, Kogi, Niger, Edo, Anambra, Delta, Bayelsa, Nasarawa, and Rivers. The following criteria were used to determine which states would be included in the PDNA;

1. Reports and preliminary impact assessments by the Presidential Committee and other international organizations and SEMAs, the primary variable being the total number of affected among the population in each state.
2. Maximum flood inundation extents extracted from Moderate Resolution Imaging Spectroradiometer (MODIS) satellite imagery by NASA GSFC (daily global flood map).
3. Estimated total number of the primarily affected population within each state.

1.5.4 Maximum inundation extent mapping for the PDNA

The Nigeria PDNA aggregated daily inundation extents

from NASA's global daily flood maps and other data sources to produce the maximum inundation extent for the period between July 1 and October 31, 2012. The results are presented in Figure 1.8. The number of days each pixel (lowest unit of space on GIS map) had been inundated over the same period was also estimated.⁷

1.5.5 Guidance for estimating damage and losses in selected sectors

The Assessment Team estimated the flood disaster's potential effect on three sectors of economic activity using the satellite data-derived maximum inundation extent.

Housing sector

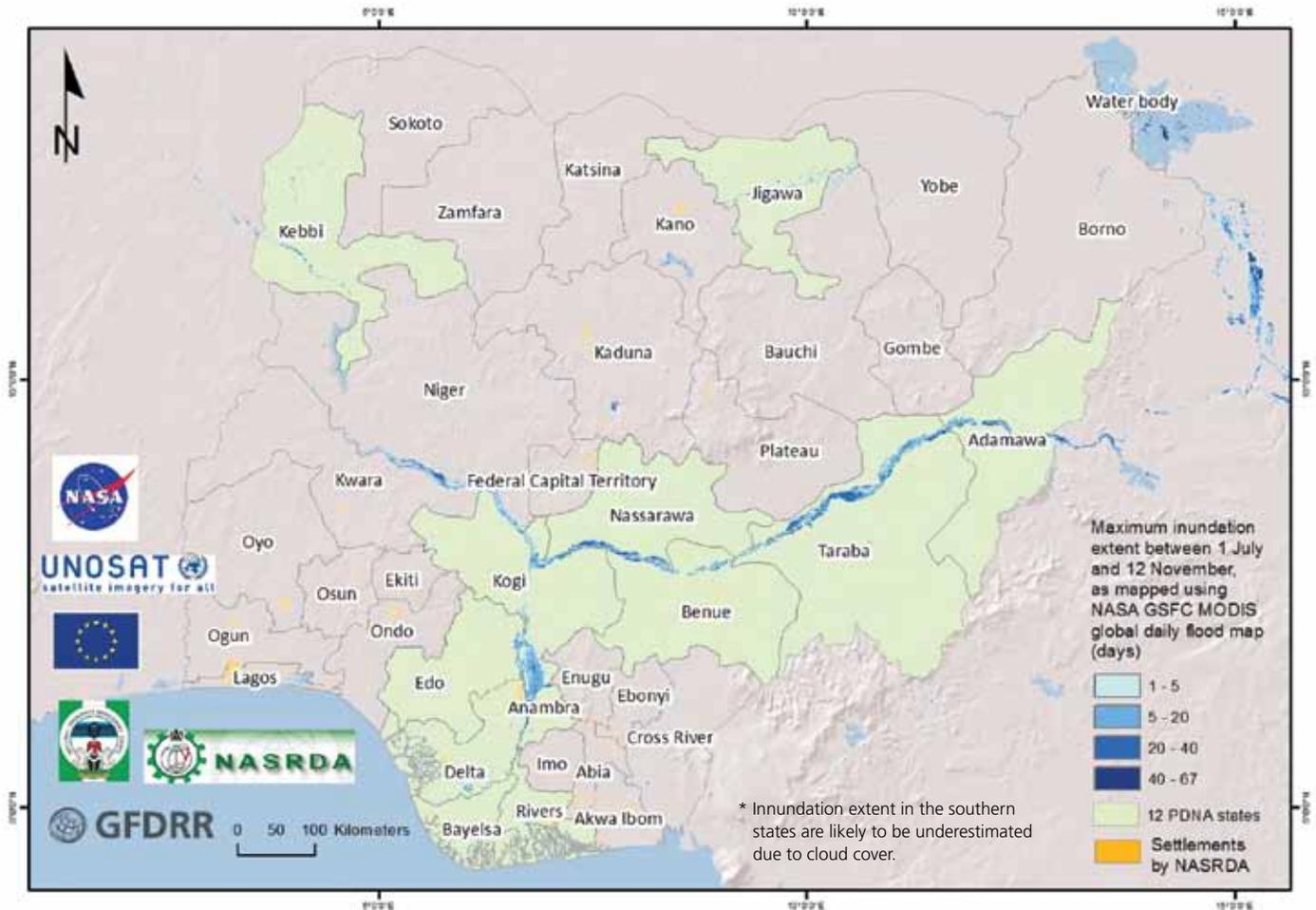
To estimate and validate the damage to the housing sector, the proportion of the population affected was used as a proxy. The maximum inundation extent was overlaid on population data (Afripop), with a pixel resolution of one kilometer, and the proportion of the population affected was calculated for each LGA and state. Initially, this information was combined with housing census statistics to estimate damage to the housing sector. These estimates were later replaced with actual housing damage information submitted by each state.

Agriculture sector

The effects of flooding on the agricultural sector were initially estimated by overlaying the maximum inundation extent on land use/land cover data provided by the Ministry of Agriculture. For each state, total agricultural area was first estimated then intersected with the maximum inundation extent in order to arrive at the proportion of agricultural land affected.

⁷ This analysis refers to the identification of the maximum flooded area in the vicinity of river courses; it is also possible that runoff on its way to river tributaries may have caused damage to infrastructure and crops in other areas that were not under long-term flooded conditions. The inundation extent mapped may under-represent the true extent of damage due to cloud cover, particularly in the southern states.

Figure 1.8: Maximum Inundation Extent



Source: Based on data provided by NASA GSFC, UNOSAT, and NASDRA.⁸

Transportation sector

The maximum inundation extent was intersected with the road network data that NASDRA produced by digitizing satellite images for the entire country. The proportion of inundated road segments by road type was estimated for each state. The NASDRA’s road network map does not include tertiary roads, hence the potential area subject to damage is likely to be underestimated (see Figures 1.9 and 1.10).

⁸ This map combines the daily global flood maps published by NASA GSFC and the Radarsat-2/Envisat-derived extents by UNOSAT in Rivers state, published for Disaster Charter. These extents are overlaid on a settlement map produced by NASDRA. Inundation in the southern states may have been underestimated due to cloud cover.

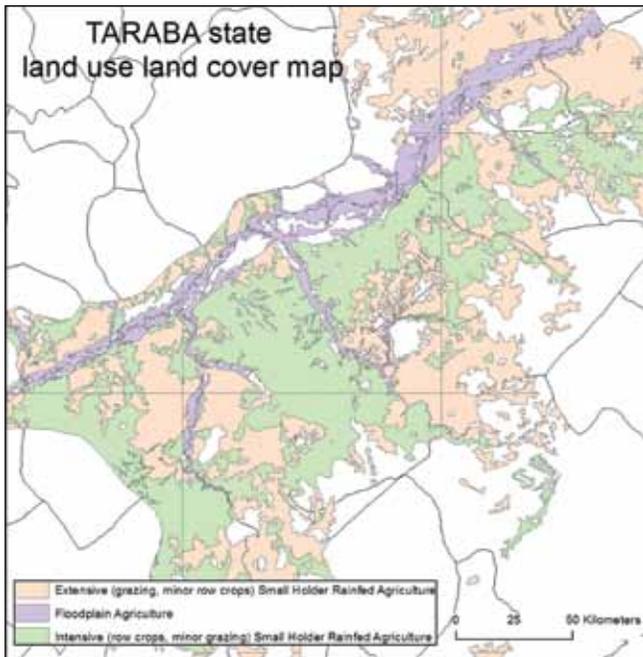
The results of this analysis were used as a guideline in the initial phase of the PDNA to estimate damage and losses for these sectors.

1.5.6 Limitation and Gaps in the Nigeria Flood PDNA

The Nigeria flood PDNA was subject to some limitations and gaps. First, the assessment could only be conducted in twelve of the country’s 36 states. In addition, the estimation of damage and losses for the oil and gas sector was only partially carried out, due to lack of detailed information available to the team.⁹ Also, the estimation for recovery of the agriculture sector does

⁹ Unsuccessful efforts were made to collect detailed information from the oil companies; even a visit to the National Petroleum Investment Management Service (NAPIMS) failed to produce the desired results.

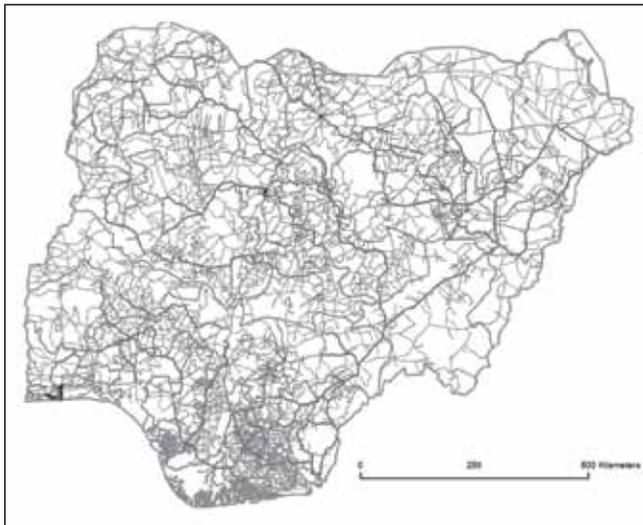
Figure 1.9: Land Use/Land Cover Map that Shows the Cultivated Areas in Taraba State



Source: Ministry of Agriculture.

not include the cost of food assistance to farmers having lost food stocks, since this figure was not determined (nor was it made available to the Assessment Team). Moreover, the differential effects of the floods on women and children were not fully captured in the report, again due to the unavailability of timely data. Despite these limitations, the assessment represents the efforts of all stakeholders, including various federal government ministries and development partners (the EU, JICA, UN), to evaluate the impacts of the Nigerian flood disaster in a timely manner.

Figure 1.10: Road Network Map



Source: NASDRA.



Irrigated fields. Nigeria. Photo: Arne Hoel / World Bank

CHAPTER 2: MACRO-ECONOMIC AND PERSONAL INCOME IMPACTS

2.1 Macroeconomic Impact

2.1.1 Impact on economic growth

This section provides an overview of the impact of the 2012 floods on economic growth in Nigeria. The flood affected several sectors of the economy and the overall impact of the flood on real GDP growth in 2012 is estimated at 1.4 percent (₦570 billion, in nominal terms). This estimation is based on the impact on real GDP growth in 2012 of both production losses and of extraordinary spending in most sectors of the economy as a result of the floods.

Additional expenditures that were made to provide initial disaster relief have been factored into this analysis, as these expenditures are expected to have an impact on GDP. However, damage to productive assets and reconstruction costs as a result of the flood have not been taken into consideration and will be covered in a separate section of this report. A large proportion of the losses were recorded in the agriculture and oil and gas sectors, as the floods affected areas of the country in which production centers for these activities are located. The agriculture and oil and gas sectors represent significant components of GDP, respectively contributing 31 and 41 percent to nominal GDP in 2011. Although it is expected that the impact of the floods will spill over into 2013, this will be to a much lower degree than in 2012.

Table 2.1: Impact of the Flood Disaster on Growth

Item	2012
2011 GDP in current basic prices (million Naira)	37,409,861
2012 GDP in current basic prices (million Naira)	40,541,633
Share of total production loss in GDP (%)	1.4
2011 GDP in 1990 prices (million Naira)	834,001
2012 GDP in 1990 prices (million Naira)	889,143
Real GDP Growth 2012 (%)	6.61

Source: National Bureau of Statistics & PDNA Sectoral Reports.

2.1.2 Impact on balance of payments

The analysis of the flood impact on the balance of payments is limited to the current account, based on available data from field visits to 12 of the states affected by the floods in Nigeria. During these visits, it emerged that ₦225 billion in oil exports (0.6 percent of nominal GDP) were lost in the 2012 fiscal year as a result of floods in oil-producing regions of the country. Oil and gas production is critical to the Nigerian economy, as oil exports account for 70.4 percent of total exports in Nigeria¹⁰ and almost 75 percent of consolidated government revenues. As a result, a large percentage of foreign exchange earnings are from oil exports, and the Nigerian economy is vulnerable to shocks in the international market for oil.

Balance of payment projections for 2012 by the Central Bank of Nigeria indicate that, prior to the floods, the current account balance was in surplus and was projected to improve by about 1.2 percent of GDP in 2012, mainly due to a projected increase in oil exports. However, in view of the losses associated with the flood, the current account surplus will improve by only about 0.6 percent of GDP in 2012.

2.1.3 Impact on inflation

Inflation has remained persistently high in Nigeria—mostly in the double digits—following on from the global food crisis in 2008 and the effects of adverse weather conditions, which resulted in a significant increase in food prices. An expansionary fiscal policy was the main driver of inflation prior to 2011. However, efforts at fiscal consolidation by the federal government, which include the utilization of an Excess Crude Account for saving windfall oil revenues above a pre-determined budget benchmark price and reductions in federal government expenditure, have resulted in a slight moderation in inflation.

¹⁰ Q3 2012 Foreign Trade Report by NBS.

The Central Bank of Nigeria has adopted a contractionary monetary policy stance for a number of years, focused on keeping monetary aggregates, the exchange rate, and interest rates stable. In 2011, year-on-year changes in the Consumer Price Index (CPI) averaged 10.9 percent but increased to 12.6 percent in the first half of 2012. This increase has been attributed to: an increase in the price of petrol and the resultant impact of the partial reversal of the subsidy on imported petrol in January 2012 on productive activities in all sectors of the economy; the high tariff on imported wheat, which affected the price of wheat products; and, to a lesser extent, the increase in electricity tariffs. The disruption to agricultural activities in the Northern part of the country due to the actions of extremist groups has also had a considerable impact on food prices in Nigeria. In recognition of the lingering effects of these inflationary pressures, prior to the floods, inflation in the 2012 fiscal year was projected at 13.05 percent.

The impact of the floods on inflation was mitigated by the government's efforts to address their short-term impact through the release of grains from strategic food reserves and the distribution of high-yielding and flood-resistant grain varieties to affected farmers for mid-season planting once the flood waters receded. Nevertheless, the average inflation rate is likely to remain high into 2013, but should trend downwards compared to 2012 levels due to the continued focus on fiscal consolidation by the Federal Government and the activist monetary policy of the Central Bank of Nigeria.

2.1.4 Impact on the fiscal sector

The current forecast of the impact of the flood on the fiscal sector takes into consideration losses in tax revenue that could result from a decline in economic activities, as well as the corresponding increase in expenditure as a result of reconstruction activities. A decline of ₦280.6 billion is expected from the productive sectors, broken down as follows: ₦225 billion from the oil industry, ₦50.8 billion from the commerce subsector, and ₦4.8 billion from the manufacturing subsector. This may result in a ₦27.75 billion decline in tax revenue, or 0.07 percent of GDP in 2012.

In its immediate response to the flood disaster the government increased expenditure on emergency projects, the total of which in 2012 is estimated at ₦35.7 billion for temporary shelter costs, ₦5.9 billion for temporary education costs, and ₦3.4 billion for temporary health assistance and disease prevention costs. Government expenditure is expected to have increased by ₦45.1 billion, or 0.1 percent of GDP. As a result, the fiscal deficit is expected to have increased by ₦73 billion, or 0.2 percent of GDP in 2012.

Table 2.2: Impact of the Flood Disaster on Government Revenues and Expenditures

Item	Value (Billions Naira)
Total Revenue before disaster	9,692.5
In percent of GDP	23.9%
Total Revenue after disaster	9,664.8
In percent of GDP	23.8%
Revenue loss	27.75
In percent of GDP	0.07%
Total Expenditure before disaster	12,195.0
In percent of GDP	28.9%
Total Expenditure after disaster	12,240
In percent of GDP	30.1%
Expenditure increase	45.1
In percent of GDP	0.1%
Fiscal Balance before disaster	-2,502.5
In percent of GDP	-6.2%
Fiscal Balance after the disaster	-2,575.2
In percent of GDP	-6.4%
Decline in Fiscal balance	-72.7
In percent of GDP	-0.2%

Note: Effective PPT Rate: 11.58%; Effective VAT Rate: 3.04%; Nominal GDP for 2012: ₦42.542 trillion.

2.2 Impact on Personal Income

2.2.1 Impact on Employment and Income of Workers in the Agriculture Sector

The impact of the 2012 flood disaster on equivalent employment losses and imputed personal income decline among workers in the agricultural sector was also determined (see Table 2.3). The findings show that a total of 27,602,524 working days were lost in the agriculture sector, amounting to ₦9,917 million in forfeit-

Table 2.3: Impact of the Flood Disaster on Employment and Income in the Agricultural Sector

State	Working days lost in crop production	Income loss by workers in crop production (million naira)	Working days lost in fisheries	Income loss of workers in fisheries (million naira)	Total working days lost in agriculture	Total income loss of workers in agriculture
Adamawa	1,070,935	107.3	244,416	61.1	1,315,351	168
Anambra	1,096,470	493.2	283,056	70.8	1,379,526	564
Bayelsa	2,820,685	1,268.7	2,444,112	611.0	5,264,797	1,880
Benue	1,512,610	680.6	294,816	73.7	1,807,426	754
Delta	1,367,390	615.3	2,898,720	724.7	4,266,110	1,340
Edo	218,950	98.4	1,005,312	251.3	1,224,262	350
Jigawa	285,560	128.4	1,629,408	407.3	1,914,968	536
Kebbi	2,996,520	1,348.3	617,760	154.4	3,614,280	1,503
Kogi	2,681,265	1,206.5	204,816	51.2	2,886,081	1,258
Nasarawa						0
Rivers						0
Taraba	2,911,355	1,310.2	1,018,368	254.6	3,929,723	1,565
Total	16,961,740	7,257	10,640,784	2,660	27,602,524	9,917

Source: Estimation by the Assessment Team on the basis of official information.

ed income. In the crop production subsector, the total number of working days lost due to the 2012 flood disaster in the 12 most affected states is 16,961,740, which represents a total income loss of ₦7,257 million. The fisheries experienced a total loss of 10,640,784 working days, amounting to ₦2,660 million.

2.2.2 Impact on Employment and Income of Workers in the Commerce Sector

Workers in the commerce sector comprising trade SMEs and micro-trade experienced a loss of working days and income due to the 2012 flood disaster in Nigeria's 12 most affected states. The findings presented in Table 2.4 demonstrate that 211,500 working days were lost in the trade SMEs, amounting to ₦93.9 million, while a total loss of 42,670,440 working days cost micro-trade roughly ₦28,418.5.

2.2.3 Impact on Employment and Income of Workers in the Manufacturing Sector

The 2012 flood disaster also heavily impacted the manufacturing sector in the 12 states under consideration. Cumulative losses in the manufacturing sector include those felt by SMEs employees, by microenterprise owners, and by microenterprise workers, for a total of 20,259,720 lost working days (see Table 2.5). The total income forfeited as a result of these lost working days amounted to ₦16,904.0 million. The highest number of working days lost by micro-enterprise workers totaled 16,848,000 days and amounted to ₦11,220.7 million.

Table 2.4: Impact of the Flood Disaster on Employment and Income in the Commerce Sector

State	Working days lost in trade SMEs	Income loss by affected trade workers in SMEs (million naira)	Working days lost in micro-trade	Income loss of micro-trade workers (million naira)
Adamawa	33,000	49.5	3,236,400	2,155.4
Anambra	19,500	7.3	1,434,780	955.6
Bayelsa	10,500	16.3	12,819,840	8,538.0
Benue	0	0	836,400	557.0
Delta	16,500	6.2	7,529,820	5,014.9
Edo	6,000	2.2	391,980	261.0
Jigawa	9,000	3.4	6,653,700	4,431.4
Kebbi	7,500	2.8	5,744,160	3,825.6
Kogi	12,000	4.5	3,860,040	2,570.8
Nasarawa	45,000	16.9		
Rivers	43,500	16.3		
Taraba	9,000	3.4	2,016,240	1,342.8
Total	211,500	93.9	42,670,440	28,418.5

Source: Estimation by the Assessment Team on the basis of official information.

Table 2.5: Impact of the Flood Disaster on Employment and Income in the Manufacturing Sector

	Adamawa	Anambra	Bayelsa	Benue	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa	Taraba	Rivers	Total
Total working days lost	1,473,984	663,336	5,823,432	379,728	3,422,880	181,224	3,022,128	2,613,816	1,756,584	922,608	922,608	7,200	20,259,720
Lost by SME employees	4,320	11,880	1,800	0	3,600	3,240	720	5,400	3,960			7,200	42,120
Lost by microenterprise owners	244,944	108,576	970,272	63,288	569,880	29,664	503,568	434,736	292,104			152,568	3,369,600
Lost by microenterprise workers	1,224,720	542,880	4,851,360	316,440	2,849,400	148,320	2,517,840	2,173,680	1,460,520			762,840	16,848,000
Total Income Loss (million Naira)	1,230.8	562.3	4,850.0	316.1	2,853.1	153.6	2,516.9	8,840.9	1,465.9	774.2	774.2	12.0	16,904.0
Income lost by SME employees	7.2	19.8	3.0	0.0	6.0	5.4	1.2	9.0	6.6			12.0	70.1
Income lost by microenterprise owners	408.0	181.0	1,616.0	105.4	949.4	49.4	838.9	724.2	486.6			254.2	5,613.2
Income lost by microenterprise workers	815.6	361.5	3,231.0	210.7	1,897.7	98.8	1,676.8	8,107.7	972.7			508.0	11,220.7

Source: Estimations by the Assessment Team using official information.



CHAPTER 3: DAMAGE AND LOSSES

3.1 Social Sector

Social sector includes housing, education, and health. Damages and losses under these sectors are discussed below.

3.1.1 Housing

Situation before the Flood Disaster

Nigeria, with a population of 160 million people, is known for its difficult housing situation. The country is characterized by an inadequate quantity and quality of sustainable housing units to meet the needs of its teeming population. Available records show that Nigeria has a housing deficit of between 14 and 16 million units, and 25 million households do not have homes.

Dwellings in Nigeria can be categorized into three broad types. These are:

- Informal housing, constructed of corrugated iron sheets or cheap, locally sourced scrap materials.
- Traditional housing, made of mud, mud blocks, wooden or bamboo walls with thatch or corrugated iron roofing.
- Modern solid housing, made of bricks or cement blocks, stabilized by earth blocks and/or steel or iron reinforcement.

Approximately 69.9 percent of households in Nigeria procure their own housing through private resources and initiatives.¹¹ A few meet their housing needs through formal institutional providers. Traditional housing, which constitutes approximately 70 percent of rural dwellings in the north and 17 percent in the south, is constructed by individual households using locally available building materials (NPC 2009).¹² Tra-

ditional housing is generally vulnerable to flooding, as these structures are built of mud—susceptible to damage. Modern housing, on the other hand, is less susceptible to the sort of damage caused by flooding, being constructed from solid, reinforced materials.

Effects of Flooding on Housing

The effects of Nigeria's recent floods on housing were enormous. In some instances, flood waters rose to a height of 2 meters (6 feet 6 inches) and higher, pulling down a great percentage of traditional (mud) houses, affecting sandcrete houses and fenced walls, and destroying household goods. These events rendered many of the residents homeless and left them in distress. Assessment of the flood impact in the 12 most affected states shows that a total of 1,337,450 houses were either fully or partially destroyed. Out of these, 73 percent (or 1,007,367) of those destroyed were traditional dwellings, while only 27 percent of modern sandcrete homes were affected. Rivers state saw the largest number of houses destroyed (243,521), followed by Adamawa state (177,364). The state with the fewest homes destroyed was Jigawa (17,135). Figure 3.1 shows the aerial view of submerged housing in Delta, Anambra, Bayelsa, and Rivers states. Table 3.1 shows the impact of flooding on the housing sector.

¹¹ See *General Household Survey 2007*, National Bureau of Statistics, Abuja.

¹² National Population Commission (NPC). 2009. 2006 population and housing census of the Federal Republic of Nigeria. Priority Table, Volume II; Abuja, NPC.

Figure 3.1: Aerial View of Submerged Housing in Delta, Anambra, Bayelsa, and Rivers States



Source: Sahara reporters.

Table 3.1: Number of Totally and Partially Destroyed Houses in the Most-Affected States

States	Traditional			Sandcrete			Total Number Affected
	Number Totally Destroyed	Number Partially Damaged	Total Number Affected	Number Totally Destroyed	Number Partially Damaged	Total Number Affected	
Adamawa	117,829	36,134	153,963		23,401	23,401	177,364
Anambra	16,186	6,719	22,905		95,394	95,394	118,299
Bayelsa	79,730	26,577	106,307		26,577	26,577	132,884
Delta	84,834	4,465	89,299				89,299
Edo	13,153	14,249	27,402				27,402
Jigawa	11,623	5,230	16,853		282	282	17,135
Kebbi	103,048	52,555	155,603				155,603
Kogi	124,085	3,102	127,187		16,259	16,259	143,446
Nasarawa	16,326	136,049	152,375		5,759	5,759	158,134
Rivers	36,999	4,111	41,110	10,121	192,290	202,411	243,521
Taraba	81,688	32,675	114,363				114,363
TOTAL	685,501	321,866	1,007,367	10,121	359,962	370,083	1,377,450

Source: Estimations by the Assessment Team on the basis of official information.

Estimates of Damage and Losses in the Housing Sector

The value of the damages consists of:

- The cost of restoring the fully/partially destroyed houses to their original (pre-disaster) status; and
- The value of destroyed and damaged household goods in the affected houses.

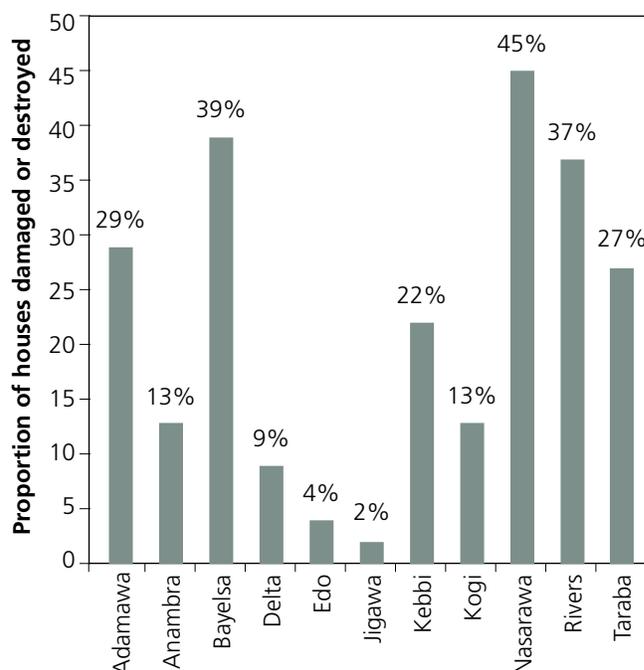
The value of the losses in the housing sector include:

- The cost of running the temporary shelter scheme;
- Removal of mud and debris from the housing units; and
- Other costs, including rental income in rented housing units.

The total estimated cost of damage to houses in the 12 states resulting from the 2012 floods is ₦1,156 billion, while total losses amount to ₦48.9 billion. The most affected states in terms of the cost of damage to houses are Bayelsa and Rivers. These are followed by Anambra, Adamawa, and Kogi states. Edo and Jigawa states recorded the least amount of housing damage, estimated at ₦187 million and ₦270 million, respectively. In terms of losses, Delta state recorded the highest value at over ₦12 billion, followed by Taraba and Bayelsa states. Interestingly, whereas Rivers state recorded high figures of damaged hous-

es, it actually noted fewer losses compared to other states. Figure 3.2 shows the proportion of damage recorded in the housing sector in the 12 most affected states, while Table 3.2 presents estimates for damage and losses by state.

Figure 3.2: Proportion of Damaged Houses in the Most-Affected States



Source: Estimations by the Assessment Team on the basis of official information.

Table 3.2: Estimated Damage and Losses, million Naira

State	Damage	Losses	Total
Adamawa	68,423.6	1,562.0	69,985.7
Anambra	77,344.2	2,825.5	80,169.7
Bayelsa	396,074.0	6,393.8	402,467.9
Delta	34,509.5	12,856.9	47,366.4
Edo	6,841.7	3,615.8	10,457.6
Jigawa	5,443.3	5,813.3	11,256.7
Kebbi	47,103.2	1,649.3	48,752.6
Kogi	62,049.6	1,362.6	63,412.3
Nasarawa	25,744.9	1,450.4	27,195.4
Rivers	396,074.0	947.0	397,021.1
Taraba	36,351.1	10,392.7	46,743.8
Total	1,155,959.9	48,869.9	1,204,829.7

Source: Estimation by the Assessment Team on the basis of official information.

Table 3.3: Distribution of Public and Private Pre-primary, Primary, and Secondary Schools in 2009-2010

	Adamawa	Anambra	Bayelsa	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa	Rivers	Taraba
Public pre-primary	420	902	100	936	473	265	190	554	225	–	189
Private pre-primary	231	273	58	639	367	–	97	257	–	–	171
Public primary	1,890	1,038	537	1,006	1,288	1,868	1,587	3,188	1,652	1,667	1,514
Private Primary	285	507	110	981	854	88	115	475	283	621	367
Public secondary	538	980	321	775	803	576	235	770	664	666	413
Private secondary	102	456	191	885	1048	24	25	297	257	475	236

Note: No data available on Benue

Source: FME 2011, Nigeria Digest of Education Statistics 2006-2010.

3.1.2 Education

Situation before the Flood Disaster

The formal education system in Nigeria includes six years of primary, three years of junior secondary, three years of senior secondary, and a minimum of four years of university education, which leads to a bachelor-level degree in the majority of the subjects. It is preceded by pre-primary education. Nigeria has abolished fees for primary and junior secondary education. Many parents, however, still report paying different types of education-related fees in public schools (UNICEF 2012).¹³ According to UNICEF, the primary and secondary net enrolment rates are respectively 66 percent and 29 percent for boys and 60 percent and 22 percent for girls (2007-2010). The educational situation is very different in different parts of the country, however. The south is educationally advantaged compared to the north, where the majority of out-of-school children are concentrated, and the educational gap between boys and girls remains substantial. The situation in the central region is closer to that in the south.

The Federal Ministry of Education (FME) is in charge of the education sector. The FME, in addition to other roles, is responsible for developing the national policy on

education, designing curricula and syllabuses, collecting data for educational planning and financing, setting standards, and controlling the quality of education in the country. Constitutionally, education is on the concurrent list, which means that all tiers of government are involved in its funding. Local government authorities are responsible for funding primary education, while the states fund secondary education, with the exception of federal unity colleges. Tertiary institutions are funded by both the public and the private sectors. The total government investment is low, however, as Nigeria spends less than 5 percent of its GDP on education (Alabi 2010).¹⁴ Although the private education sector is growing, in 2010 the public sector still accounted for 92 percent of total enrolment in primary school, and 82 percent of total enrolment in junior secondary school (FME 2011).¹⁵ The distribution of public and private primary and secondary schools is as shown in Table 3.3 for the 12 states covered by this sector report.

The quality of school infrastructure varies. Most schools are constructed with cement blocks, while some are made of mud. Often, funds are inadequate, schools are poorly designed, and the national construction standards are not strictly respected. Many school buildings are weak due to poor construction and a lack of regu-

¹³ United Nations Education Scientific and Cultural Organization (UNESCO). 2012. Education for All Global Monitoring Report - Youth and Skills: Putting Education to Work. UNESCO, Paris.

¹⁴ Alabi 2010.

¹⁵ Federal Ministry of Education (FME). 2011. Nigeria Digest of Education Statistics (2006-2010).

lar maintenance. In recent years, many schools have reported that they do not have enough classrooms, and that a number of the existing ones need repairs. In 2007-2008, in the 12 states that experienced the highest levels of flooding and which are under review, only 25 percent of the public primary schools had electricity, and only 61 percent had drinking water (FME 2011).

The Strategic Plan for the Development of the Education Sector 2011-2015 signifies the readiness of the FME to tackle the challenges preventing the education system from fully playing its key national development role. The Plan covers six focal areas: 1) Strengthening the institutional management of education; 2) Access and equity; 3) Standard and quality assurance; 4) Teacher education and development; 5) Technical and vocational education and training; and 6) Funding, partnerships and resource mobilization. In line with the goals of the federal government's Transformation Agenda, the Plan sets the stage so that, by the end of the Plan period, the education system will be capable of effectively supporting Nigeria's human capacity needs and meeting its developmental objectives.

Some of the key programs in the Plan are the back-to-school programs aimed at boys that have dropped out of school, the Almajiri program for children in quranic schools merging western and quranic education, and the girls' education program—all aimed at increasing access to education among disadvantaged groups. These programs have greatly contributed to the progress made toward reaching Millennium Development Goal 2, which aims to achieve universal primary education. Regional differences remain significant, however, and if the target is to be met, progress in the north must be accelerated.

Effects of the 2012 Flood on Education

The floods hampered the education sector's ability to deliver on its objectives. In many states, schools were closed for at least two months. State ministries of education officially closed schools because they were flooded, because access roads to the schools were blocked by floods, and due to the high risk of students drowning in the flooded school area. Some schools attempted

to operate in a rented building or a tent, which is not necessarily conducive to learning and thus affects the quality of education. In addition, those children who attend classes outdoors or in a tent are more vulnerable to health risks, such as the common cold or more severe related diseases, such as pneumonia. Many of the schools that have reopened lost all of their furniture, along with teaching and learning materials, which makes it difficult for both teachers and students to resume their normal education routines, thus further compromising quality.

Demand for education was also impeded as certain children whose schools remained open temporarily dropped out because either they or their parents did not want to risk crossing the flood waters to reach the school. Now that many schools have reopened, physical access to schools remains an issue, with families reporting that children are not attending classes due to road conditions. In addition, many children find themselves without school uniforms and learning materials, including notebooks and pens, as these were destroyed in the flooding. Considering the fact that many public schools lost their teaching materials and equipment, it is possible that schools may have to levy compensatory fees in the future. This might further discourage children—particularly those from poor families living in rural areas—from attending, causing them to stay at home to help their parents instead.

Some schools were used as temporary shelters for families whose houses were submerged or destroyed. In the six states that reported on this issue, more than 200 schools were, at the time of the assessment, being used as temporary shelters. Some of them (it is unclear how many) consequently sustained damage due to the overuse. It was even reported that in some schools, internally displaced people (IDP) used school benches as firewood.

Estimates of Damage and Losses in the Education Sector

The value of damage was estimated based on the number of different types of schools (primary and secondary) that were partially or totally destroyed by the floods, combined with the unit values of repair and construction prevailing in the period just prior to the

Table 3.4: Number of Totally and Partially Destroyed Primary and Secondary Schools in the Most Affected States

State	Primary			Secondary		
	Number Partially Damaged	Number Totally Destroyed	Total Number Affected	Number Partially Damaged	Number Totally Destroyed	Total Number Affected
Adamawa	280	45	325	46	0	46
Anambra	1,050	256	1,306	323	93	416
Bayelsa	234	20	254	163	1	164
Delta	238	12	250	75	3	78
Edo	10	8	18	3	0	3
Jigawa	197	104	301	16	0	16
Kebbi	89	23	112	0	0	0
Kogi	105	118	223	13	33	46
Nasarawa	111	83	194	73	70	143
Rivers	116	0	116	81	0	81
Taraba	48	58	106	1	0	1
Total	2,478	727	3,205	794	200	994

Source: Estimation by the Assessment Team on the basis of official information.

flood disaster, plus the cost involved in replacing destroyed furniture, equipment and education materials. Losses included the cost of temporarily renting alternative premises and/or building temporary learning spaces, overtime payment for teachers, teacher training on psychosocial support and classroom management, a possible loss in revenue and other additional costs involved in the post-disaster temporary education scheme, as well as repairing and disinfecting schools.

Flooding affected 4,646 schools across the 12 states concerned. Available data shows that 2,478 primary schools were partially damaged, while 727 were totally destroyed. Also 794 secondary schools were partially damaged and 200 totally destroyed. Table 3.4 disaggregates this information by state. The damaged and destroyed primary and secondary school buildings include classrooms, offices, libraries and teachers' quarters. Some secondary schools additionally have laboratories and student hostels. Both for primary and for secondary education, the damage and loss data include few private schools. This seems to reflect the situation on the ground, since not many private schools were damaged or destroyed. Relative to the number of schools in the LGAs, the highest value of damage was reported for Ibaji in Kogi state, where all primary and

secondary schools were submerged. Most of the damaged and destroyed schools also lost much, if not all, of their furniture and teaching and learning materials. Textbooks and educational equipment such as blackboards, chalk, and maps were destroyed by the water. Most of the furniture, both for pupils and teachers, was destroyed because it was submerged for too long. A number of secondary schools also suffered damages to their laboratories and hostels.

It is worth noting that, of all affected primary schools, 77 percent were partially damaged. For the secondary schools, this figure is slightly higher, at 80 percent. Comparing the education sector in the different states, Anambra is the most seriously affected, with 41 percent of all the affected primary and 42 percent of all the affected secondary schools. For primary education, Adamawa and Jigawa states follow, with respectively 10 and 9 percent of all the affected schools. Bayelsa (16 percent) and Nasarawa (14 percent) are the second- and third-most affected states when it comes to secondary education.

The value of destroyed assets in the education sector was estimated at N82.1 billion, and the subsequent losses rose to N15.2 billion more. Thus, the total value of damage and losses was estimated at N97.3 billion (see Table 3.5).

Table 3.5: Values of Damage and Losses to the Education Sector, million Naira

	Adamawa	Anambra	Bayelsa	Delta	Edo	Jigawa	Kebbi	Kogi	Nassarawa	Rivers	Taraba	Total
Damage	5,027.0	20,802.0	8,937.80	4,098.0	324.0	4,251.0	1,404.5	4,293.0	30,702.1	696.0	1,611.0	82,134.6
Primary												
Fully destroyed	562.5	-	300.0	180.0	120.0	1,300.0	287.5	1,475.0	5,450.0	-	725.0	10,400.0
Partially destroyed	1,962.5	6,300.0	1,404.0	1,428.0	60.0	985.0	445.0	525.0	515.0	696.0	240.0	14,560.5
Secondary												
Fully destroyed	-	2,790.0	30.0	90.0	-	-	-	825.0	23,325.0	-	-	27,060.0
Partially destroyed	552.0	3,876.0	3,912.0	900.0	36.0	160.0	-	130.0	1,150.0	-	10.0	10,726.0
Equipment	1,950.0	7,836.0	3,280.0	1,500.0	108.0	1,806.0	672.0	1,338.0	262.1	-	636.0	19,388.1
	732.0	3,785.5	1,195.2	703.0	36.7	415.6	118.6	523.2	7,005.3	573.0	123.1	15,211.2
Cleanup												
Primary	11.5	49.7	8.4	7.9	0.9	13.4	4.3	11.8	35.1	3.4	5.7	152.0
Secondary	3.4	37.4	12.0	6.0	0.2	1.2	-	5.8	145.6	-	0.1	211.6
Psychosocial												
Primary	130.0	522.4	101.6	100.0	7.2	120.4	44.8	89.2	215.6	46.4	42.4	1,420.0
Secondary	166.8	332.8	131.2	62.4	2.4	12.8	-	36.8	838.4	64.8	0.8	1,649.2
Overtime teachers												
Primary	195.0	783.6	152.4	150.0	10.8	180.6	67.2	133.8	323.4	69.6	63.6	2,130.0
Secondary	220.8	1,996.8	787.2	374.4	14.4	76.8	-	220.8	5,030.4	388.8	4.8	9,115.2
Rental premises												
Primary	4.5	25.6	2	1.2	0.8	10.4	2.3	11.8	43.6	0	5.8	108.0
Secondary	0	37.2	0.4	1.2	0	0	0	13.2	373.2	0	0	425.2
Total	5,759.0	24,587.5	10,133.0	4,801.0	360.7	4,666.6	1,523.1	4,816.2	37,707.4	1,269.0	1,734.1	97,345.8

Source: Estimations by the Assessment Team on the basis of official information.

3.1.3 Health

Situation before the Flood Disaster

The health network in Nigeria is based on a typical Primary Health Care approach, with community-based services, as well as primary, secondary and tertiary care levels. Community level includes, among others, drug shops and homes for traditional birth attendants. The primary care level includes Primary Health Centers, Dispensaries, maternity homes, and Health posts. The secondary care level includes General Hospitals, State Hospitals, and Cottage Hospitals. The tertiary level includes Teaching Hospitals, Federal Medical Centers and Specialist Centers.

The Nigerian health sector is guided by the *National Strategic Health Development Plan (NSHDP) 2010–2015*. The NSHDP was developed in accordance with extant national health policies and legislation, and international declarations and goals to which Nigeria is a signatory, namely; MDGs, the Ouagadougou Declaration on PHC and the Paris Declaration on Aid Effectiveness. Nigeria is a signatory to the International Health Partnerships Global Compact (May 28, 2008). The vision is “*To reduce the morbidity and mortality rates due to communicable diseases to the barest minimum; reverse the increasing prevalence of non-communicable diseases; meet global targets on the elimination and eradication of diseases; and significantly increase the life expectancy and quality of life of Nigerians.*” The overarching goal of the NSHDP is to significantly improve the health status of Nigerians through the development of a strengthened and sustainable health care delivery system.

While progress is being made, the health sector in Nigeria still faces several challenges, as described in the 2011 sector review. Life expectancy at birth has increased from 48 in 1990 to 54 in 2009. There has been a progressive increase in the percentage of fully immunized children (FIC) aged 12–23 months, over a 6-year period from 12 percent in 2003 to 18 percent in 2006 and up to 53 percent in 2010. National measles vaccination coverage is sub-optimal to prevent transmission among the population of the flood-affected

areas. Since January 1, 2012, 3,463 measles cases have been reported in Nigeria. Polio is endemic in the country with 97 cases reported as of October 2012, which constitutes an increase of 36 over the past year. Immunization Plus Days (IPDs) were conducted in 11 high-risk states in the north of the country from October 6–9, 2012. A baseline survey of primary healthcare services in 2010 reported that only 5.7 percent of public health facilities provide all components of the Ward Minimum Healthcare package.¹⁶ The overall HIV prevalence rate in the population is estimated to be 4.1 percent, with 3.1 million people living with the virus. As of 2011, 852,846 were receiving antiretroviral therapy (ART).¹⁷ Approximately 21 states are either experiencing progressively rising HIV prevalence, a sudden rise in HIV prevalence, or state HIV prevalence higher than the national median of 4.1 percent. The Tuberculosis case detection rate (CDR) under directly observed treatment short course (DOTS) doubled from 20 percent in 2010 to 43 percent in 2011.

Malaria prevalence among children under 5 based on microscopy testing was 42 percent.¹⁸ According to the latest data (FMH 2010), there has been a five-fold increase of children under 5 sleeping under insecticide-treated nets (ITN), from a baseline of 6 percent to 29 percent. The NDHS 2008 reported the overall maternal mortality ratio (MMR) in Nigeria as 545/100,000 live births. While 70 percent of PHC facilities visited during the 2011 Joint Annual Review exhibited many components of Basic Emergency Obstetric Care (BEOC), none of them offered the complete package.

Furthermore, based on NDHS 2008, 39 percent of births were assisted by a skilled health worker. In 2011, despite some variation, virtually all the states reported a measure of improvement on their baseline figures. Ongoing high-impact interventions, such as the Midwives Services Scheme (MSS), are expected to deliver

¹⁶ NACA 2011. *Baseline survey of primary healthcare service and utilization in Nigeria*.

¹⁷ <http://naca.gov.ng/content/view/417/lang.en/>

¹⁸ Federal Ministry of Health (FMH) 2010. *Nigeria Malaria Indicator Survey (NMIS) – National Malaria Control Programme*; Abuja, FMH.

significant improvements in maternal health. The per capita health expenditure has increased from Naira 2,720 (US\$17) in 2000 to Naira 11,680 (US\$73) in 2008. Nonetheless, direct out-of-pocket payment for healthcare services is still very common, accounting for over 60 percent of total health expenditures in the country, implying that Nigeria is still largely operating a cash-and-carry system of health services. Community-based Health Insurance Schemes and other related programs, including private sector health insurance schemes, cover only around 5 percent of the entire population.

At least 25 states and the FCT reported “Free Maternal and Child Health (MCH) Services” or similar schemes aimed at providing a safety net for pregnant women and children under five years of age to access vital healthcare. Many states reported providing medical assistance to some other groups, such as the elderly, orphans, and widows. In addition, many poor and vulnerable groups were reported to have benefited from the massive free distribution of insecticide-treated nets and new anti-malarial drugs across the country. Some states also reported exemption from payment for people considered indigent and who could not pay. Unfortunately, the albatross of such free health programs is the break in the supply chain of essential drugs and supplies, without which the credibility of such programs necessarily suffers. As such, most clients still have to buy their own drugs and other supplies.

Effects of the 2012 Floods on Health

According to NEMA (2012), as of November 15, 2012 there have been 363 deaths, 5,851 injured, 3,891,314 people affected, and 3,871,53 people displaced by the flooding. In the affected areas, 11.4 percent of primary, 24.8 percent of secondary and 8.3 percent of health facilities were damaged or destroyed by the floods, interrupting basic preventive and curative health services and reducing access to appropriate health care. In most affected LGAs in Kogi, 80 percent of the health facilities were damaged or destroyed. Flooding caused damage to and the overflow of sanitation facilities, increasing the risk of contamination of water sources. This could facilitate the spread of diarrheal diseases

such as cholera. It could also enhance mosquito breeding and increase vector-borne diseases such as malaria. The loss of shelter and additional exposure will also increase the risk of pneumonia and related deaths, especially in children under five years of age. Some cases of measles have been detected, but no significant outbreaks have been confirmed as yet. Malaria and diarrhea are responsible for the greatest disaster-related morbidity rates. The main public health threats in the 2012 flooding crisis are related to communicable diseases, whose associated risk factors include:

- Interruption of safe water and sanitation supplies. The populations displaced by flooding are at immediate and high risk of outbreaks of waterborne and food borne diseases.
- Temporary population displacement with overcrowding. Populations in the affected areas have been relocated into schools, camps, or lodged with host families, and are at immediate and high risk for the transmission of measles and meningitis and increased incidence of acute respiratory infections (ARI), especially pneumonia in children under five.
- Vector breeding. Flooding can result in the proliferation of vector breeding sites, increasing the medium-term (weeks to months) risk of malaria and yellow fever.
- Poor access to health services is of immediate concern. The health infrastructure has been destroyed or overwhelmed, supplies have been damaged, and healthcare workers displaced.
- Malnutrition and transmission of communicable diseases. Malnutrition compromises natural immunity, leading to more frequent, severe, and prolonged episodes of infections. Severe malnutrition often masks symptoms and signs of communicable diseases, making prompt clinical diagnosis and early treatment more difficult.

Estimates of Damage and Losses in the Health Sector

The details of direct physical damage to health facilities are presented in Table 3.6. Facilities at the tertiary level include Teaching Hospital/Federal Medical Center/

Specialist Center/other tertiary facilities; facilities at the secondary level include General Hospital/State Hospital/Cottage Hospital/other secondary facilities; facilities at the primary level include Primary Health Center/Dispensary/Maternity Home/Health Post/other primary facilities; while facilities at the community level include drug stores, homes for traditional birth attendants, etc.

The value of damage in this sector was estimated based on the cost of rebuilding and repairing all hospitals and other health facilities that were totally or partially destroyed in both publicly- and privately-owned facilities, as well as on the replacement value of the furniture, equipment, and supplies that were destroyed. The

value of losses was estimated by figuring the cost of demolishing and removing rubble and mud after the disaster, the expenses related to establishing temporary health facilities and ensuring temporary additional healthcare provision, and factoring in revenue losses due to the disaster.

The value of the damage and losses is presented in Table 3.7. Available data shows that total damage incurred in the health sector due to the 2012 flood is N18,204.8 million, while total losses amount to N9,476.8 million. Damage to public facilities was higher than to private facilities.

Table 3.6: Percentage of Physically Damaged Health Facilities in the Different Levels

	Total damaged health facilities				
	Number of Partially Damaged Public Facilities	Number of Fully Destroyed Public Facilities	Number of Partially Destroyed Private Facilities	Number of Fully Destroyed Private Facilities	Total Number of Damaged Health Facilities
	(% of total)	(% of total)	(% of total)	(% of total)	(% of total)
Tertiary level	8.3	0	0	0	8
Secondary level	12.3	1.2	12.3	4.6	10.1
Primary level	7.25	1.3	6.5	0	19.6

Source: Estimation by the Assessment Team on the basis of official information.

Table 3.7: Values of Damage and Losses in Health Sector, million Naira

State	Damage			Losses			Total Effects		
	Public	Private	Total	Public	Private	Total	Public	Private	Total
Adamawa	562.7		562.7	469.0		469.0	1,031.7	–	1,031.7
Anambra	1,236.4		1,236.4	469.0		469.0	1,705.5	–	1,705.5
Bayelsa	3,126.4		3,126.4	2,626.6		2,626.6	5,753.0	–	5,753.0
Benue	32.9		32.9	281.4		281.4	314.4	–	314.4
Delta	2,574.1		2,574.1	375.2		375.2	2,949.4	–	2,949.4
Edo	764.6		764.6	187.6		187.6	952.2	–	952.2
Jigawa	257.2		257.2	187.6		187.6	444.8	–	444.8
Kebbi	-		-	281.4		281.4	281.4	–	281.4
Kogi	1,524.4		1,524.4	3,001.9		3,001.9	4,526.3	–	4,526.3
Nassarawa	767.9		767.9	93.8		93.8	861.7	–	861.7
Rivers	2,446.0	4,821.6	7,267.6	1,125.7	96.0	1,221.7	3,571.7	4,917.6	8,489.2
Taraba	90.7		90.7	281.4		281.4	372.2	–	372.2
Total	13,383.2	4,821.6	18,204.8	9,380.9	96.0	9,476.8	22,764.1	4,917.6	27,681.7

Source: Estimation by the Assessment Team on the basis of official information

3.2. Productive Sectors

3.2.1 Agriculture

Situation before the Flood Disaster

Agriculture (comprising crops, livestock, forestry, and fisheries) is the lead sector responsible for providing income and employment to rural populations. The sector employs 90 percent of the rural poor, nearly 70 percent of the total labor force, and generates 90 percent of non-oil export revenues. After a very slow growth during the 1970s and 1980s, agricultural growth picked up during the 1990s. Since 2000, growth in this sector has averaged 5.6 percent per year, well above the Africa-wide average and close to the government's target rate of 6 percent per year. In fact, agriculture has grown over the years in both nominal and real terms. Value-added in agriculture (nominal) grew from ₦3,904 billion in 2004 to ₦7,574 billion in 2007. The growth rate of agriculture was 5.1 percent in the period from 2000 to 2004 and 7.1 percent between 2004 and 2007. In 2007 and 2008, agriculture alone contributed 41.5 percent and 42.1 percent respectively to the national GDP. As for the growth rate in the 2004–2007 period, the crop, livestock, fishery, and forestry subsectors contributed 90.1 percent, 5.9 percent, 2.9 percent and 1.1 percent respectively. Thus, the crop production subsector is the key source of agricultural growth in Nigeria. The eleven major crops grown in Nigeria are yams, cassava, sorghum, millet, rice, maize, beans, dried cowpeas, groundnuts, cocoyams, and sweet potatoes. These major crops, which account for roughly 75 percent of total production, increased from 81,276 tons in 2004 to 95,556 tons in 2007. Other main crops include plantains/bananas, ginger, cocoa, rubber, oil palm, gum Arabic, cashews, mangos, citrus, pulses, and pineapples.

Although agriculture grew substantially over the last few years, this growth is attributable to an increase in land under cultivation. Even as Nigeria contains 79 million hectares of fertile land, only 32 million hectares (46 percent) are cultivated. Productivity has been consistently low; households with less than two hectares under cultivation account for more than 90 percent of

the country's agricultural output (FMA 2008). Typical farm sizes range from 0.5 hectares in the south to four hectares in the north. In fact, 80 percent of farm holdings are small- in scale and hardly produce enough to sustain their owners for eight months. During bad crop years resulting from poor or poorly distributed rainfall and other natural calamities (e.g., floods, bird and insect infestations, outbreaks of plant diseases), the capacity of small-scale farmers to cope is further reduced and many may go hungry.

The supply of agricultural inputs has also generally been suboptimal. Nigerian fertilizer consumption at 7 kg/hectare is one of the lowest in Sub-Saharan Africa. Less than 10 percent of irrigable land is actually under irrigation. Furthermore, farmers have limited access to credit and the existing extension services are inadequate. There is currently one extension worker per 25,000 farm families in Nigeria, compared to a best practice that would have 1 worker available for every 400–1,000 families (FMARD 2008). Mechanized assistance is also insufficient. There are only about 30,000 tractors available to roughly 14 million groups/families in Nigeria. On the processing front, Nigeria loses between 15 –and 40 percent of its agricultural produce due to its inability to process it in a timely fashion. In the livestock subsector, local supplies are inadequate. The daily animal protein intake per head per day is currently at 10 grams, compared to the FAO-recommended 36 grams.

Despite this gloomy picture of Nigeria's agriculture sector, the federal government, through the Agricultural Transformation Agenda (ATA), has made some advances, especially in the areas of food processing and value addition, and has thus given some hope to the sector. For example, to stimulate domestic production and the processing of cassava, bakeries will enjoy a corporate tax rebate of 12 percent if they attain 40 percent blending of wheat flour with cassava flour within a period of 18 months. Additionally, to facilitate farmers' access to credit, the government is guaranteeing 70 percent of the principal of all loans made for the supply of seeds and fertilizer by the private sector. Also, under the Nigeria Incentive-Based Risk-Sharing

System for Agriculture Lending (NIRSAL), ₦450 billion was set aside to serve as a credit portfolio to support the federal government's Agricultural Transformation Agenda. In an effort to enhance the production of oil palm, the Federal Ministry of Agriculture and Rural Development secured 4 million improved *tenera* oil palm nuts from the Nigerian Institute for Oil Palm Research; these will be raised into mature seedlings by 70 public and private sector nursery operators, then distributed to farmers for field planting in 2013. This initiative will cover 26,666 hectares of oil palm plantations.¹⁹

Effects of the 2012 Flood on Agriculture

Most of the agricultural and livestock-raising activities take place in low-relief areas of the major river flood plains, taking advantage of the proximity to water. It is precisely for that reason, combined with the widespread absence of flood control works and of effective flood warning schemes, that production in these very important sectors of the economy is highly vulnerable to floods. Worse yet, the extraordinary 2012 floods occurred in the last quarter of the calendar year, near the time of harvest for many food crops, which went submerged for several days and caused the massive loss of production.

An early assessment of the flood impact covering 14 states of the federation was conducted by the Food and Agriculture Organization (FAO), in close cooperation with the Ministry of Agriculture and Rural Development (MARD) and the World Food Program (WFP).²⁰ This early assessment covered the impact of the disaster on five food crops—rice, sorghum, cassava, yams and maize—and analyzed the flood effects on fishery and aquaculture facilities and production. This assessment concluded that nearly 30 percent of the rice crop production was lost due to floodwaters, and that lower percentages of the other four food crops would also be lost. It also underscored the fact that the estimated agriculture production loss represented

a relatively small fraction of total national production, so that existing stocks would be sufficient—if opportunistically mobilized—to cover the ensuing deficit.

Estimates of Damage and Losses in the Agricultural Sector

On the basis of the existing FAO assessment, and with additional information provided by officials from the FAO, WFP, and MARN, a supplemental assessment of the flood effects on the three sectors was later conducted.

Crops

First, an analysis was made to determine whether other significant crops may have been affected by the floods in the states under consideration. When that proved to be the case, selected crops were added to the previous analysis. This second assessment followed the procedures used in the FAO assessment, namely: the ratio of flooded areas to total agriculture areas in each of the states was combined with the planted area for each of the crops affected by the floods and with the average unit yield achieved during the previous year (2011). This enabled assessors to estimate the amount of production losses for each affected crop, which were later combined with farm-gate prices paid to the producers for each commodity. The estimated monetary value of production losses for all crops in the 14 states is ₦305.1 billion (see Table 3.8).

In addition to the above, the irrigation and drainage systems which used to provide sufficient water to satisfy the needs of crops sustained partial damage and destruction, at an estimated cost of ₦1,600 million. These irrigation and drainage works will need to be rebuilt in order to assure crop production in the next dry season; failure to do so will cause additional production losses.

Livestock

Many domestic animals drowned during the floods. The numbers of dead animals by state were provided by FMARD officials during the assessment and are presented in Table 3.9.

¹⁹ See the FMARD Progress Report on the Transformation Agenda, 2012.

²⁰ See FAO, *Joint Assessment Report on Flood Damage and Loss for Agriculture and Food Security Response and Rehabilitation*, Abuja, 2012.

Table 3.8: Estimated Production Losses of Crops, million Naira

State	Production Losses, million Naira
Adamawa	3,650.1
Anambra	27,322.9
Bayelsa	13,178.6
Benue	21,751.3
Delta	42,296.8
Edo	3,896.9
Imo	6,149.6
Jigawa	1,769.9
Kebbi	14,013.5
Kogi	56,547.9
Kwara	38,319.8
Niger	12,389.6
Plateau	12,592.8
Taraba	51,190.5
Total	275,977.30

Source: Estimations by the Assessment Team using official information

Table 3.9: Number of Drowned Animals Due to the 2012 Floods

State	Animals that died due to the floods			
	Cattle	Goat/Sheep	Pigs	Poultry
Adamawa	108,404	243,909		243,909
Anambra		73,981	80,147	141,798
Bayelsa		373,525	448,230	2,988,198
Benue	1,958	25,454	15,664	25,454
Delta		345,370		345,370
Edo		7,323		7,323
Imo		8,263	11,123	6,356
Kebbi	173,413	867,064		520,238
Kogi	3,656	43,870		47,526
Kwara	677	9,137		5,076
Niger	3,263	12,021	4,410	126,769
Plateau	21,669	57,784	14,446	130,013
Taraba	41,736	93,906		93,906
Total	354,776	2,161,607	574,020	4,681,936

Source: FMARD.

Estimates were made using average unit prices for each type of animal in order to arrive at the value of the dead animal stock. Further estimates were made of the future production of meat and eggs that will not be forthcoming due to the death of these animals, assuming that only natural replacement of the stock would be made, and on the basis of the average quantity of production per type of animal and the corresponding prices paid to the animal owners. These estimations of monetary value of dead animals and of subsequent production losses²¹ are shown in Table 3.10.

Table 3.10: Estimated Value of Damage and Losses in the Livestock Subsector

State	Million Naira	
	Damage	Production Losses
Adamawa	16,558.7	19,255.9
Anambra	3,625.1	3,098.6
Bayelsa	23,980.3	20,192.7
Benue	1,106.3	1,056.8
Delta	6,562.0	6,543.7
Edo	139.1	138.7
Imo	442.4	373.7
Kebbi	34,856.0	39,276.4
Kogi	1,243.0	1,330.7
Kwara	240.0	257.9
Niger	931.5	941.7
Plateau	4,001.5	4,423.3
Taraba	6,375.2	7,413.6
Total	100,061.1	104,303.7

Source: Estimations by the Assessment Team using official information.

Fishery

Fishing and aquaculture facilities located in the flood plains sustained negative effects, including loss of fish stock in ponds, destruction of fishing gear, and future production and income losses. It was estimated that production losses lasted over two months, and an average unit price of ₦8,000 per ton of fish was used to monetize these losses (see Table 3.11).

²¹ It is assumed that these production losses will be spread over the period from October 2012 through March 2015.

Table 3.11: Estimation of Fishery Production Losses Due to the 2012 Floods

State	Production loss, tons	Value of production loss, million Naira
Adamawa	2,051	16.4
Anambra	238	1.9
Bayelsa	5,565	44.5
Benue	236	1.9
Delta	5,991	47.9
Edo	2,446	19.6
Imo	365	2.9
Jigawa	78	0.6
Kebbi	8,750	70.0
Kogi	562	4.5
Kwara	235	1.9
Niger	596	4.8
Plateau	48	0.4
Taraba	2,813	22.5
Total	29,972	239.8

Source: Estimations by the Assessment Team using official information.

3.2.2 Manufacturing and Commerce

Situation before the Flood Disaster

Nigeria has achieved strong non-oil economic growth over the last decade, although oil and gas still make up 90 percent of exports and 70 percent of consolidated government revenue. The domestic trade sector (wholesale and retail, as described in the national accounts) has grown rapidly in recent years, overtaking oil and gas to become the second-largest contributor to GDP after agriculture. This sector increased its share of output from 15 percent to over 20 percent between 2006 and 2012. Manufacturing constitutes a much smaller sector,²² although several important manufacturing clusters—including the production of plastics, car parts, and processed food and beverages—exist in major cities. A recent survey of micro, small

²² NBS chart above shows a contribution of less than 2 percent to GDP; the *First National Implementation Plan for Nigeria's Vision 2020 plan (2010-2013)* notes, however, that it contributed an average of 4 percent to GDP between 2004 and 2009.

Table 3.12: Number of Microbusinesses, SME Manufacturing Businesses, and SME Wholesale and Retail Businesses in Selected Flood-affected States

State	No. of Microbusinesses	No. of SMEs in Manufacturing	No. of SMEs in Wholesale and Retail
Adamawa	405,281	41	22
Anambra	499,070	251	88
Bayelsa	420,233	14	7
Benue	438,381	81	74
Delta	488,023	109	74
Edo	481,220	224	125
Jigawa	438,502	102	15
Kebbi	388,714	68	81
Kogi	473,882	88	22
Nasarawa	488,885	143	118
Taraba	380,882	75	22
Rivers	585,241	156	140
Total	5,488,314	1,352	788
Nigeria total	17,281,753	6,009	4,210
% of business in flood-affected states	32%	22%	19%

Source: SMEDAN 2010, 118-119.

Table 3.13: Number of Microbusinesses, SME Manufacturing Businesses, and SME Wholesale and Retail Businesses in Four Leading States

State	No. of Microbusinesses	No. of SMEs in Manufacturing	No. of SMEs in Wholesale and Retail
Lagos	880,805	1,195	545
Kano	872,552	978	427
Kaduna	548,467	272	287
Oyo	523,209	272	294

Source: SMEDAN 2010.

and medium businesses in Nigeria published in 2012 (SMEDAN 2010²³) noted that there were 17.2 million microenterprises in Nigeria (0-10 employees), 21,000 small enterprises (10-49 employees), and 1,654 medium enterprises (50 to 200 employees).²⁴ Out of the

36 states in the country, the 12 most affected by the floods contained around one-third of the nation's micro businesses, but boasted proportionately fewer small and medium enterprises in manufacturing and wholesale and retail, as shown in Table 3.12.

²³ SMEDAN *National MSME Collaborative Survey 2010*, released in 2012.

²⁴ SMEDAN defines by quantity of assets: Microbusinesses have less than ₦5 million in assets; Small less than ₦50 million; Medium less than ₦500 million. Where there is conflict between asset and employment definitions, employment takes precedence.

Flooding did not significantly affect those states with the largest numbers of MSMEs—Kano, Kaduna, Lagos, and Oyo (Table 3.13)—which between them are home to 16 percent of Nigeria's microbusinesses, 45 percent of SME manufacturing companies, and 37 percent of SME wholesale and retail companies.

Table 3.14: Estimate of Employment within the Businesses in Flood-affected States

	Estimated Employment Nationally	Estimated Employment in Flood-affected States
Microbusiness	Approx. 15 million	Approx. 5 million (12 states)
SME Manufacturing	9,683	2,130 (12 states)
SME Wholesale and Retail	6,727	1,278 (12 states)
Anambra Large Manufacturing	–	20,000 (Anambra only)
Anambra Trading Enterprises	–	200,000 (Anambra only)

Source: Estimations by the Assessment Team using official information.

The relatively high number of medium-size manufacturing businesses in Anambra State (251) reflects that state's importance in Nigeria's small manufacturing sector. In addition to these medium-size businesses, Anambra has an even more significant concentration of large manufacturing enterprises, some with up to 1,500 employees, devoted to the production of plastics, piping, paper, recycling, motor parts, chemicals, and agribusiness, among others. It has been estimated that around 200 manufacturing firms employing an estimated 20,000²⁵ people operate in this area. Anambra is also home to another important category of business that is not well captured by the SMEDAN survey. These are the approximately 40,000 trading enterprises in and around the trading town of Onitsha that are microenterprises in terms of employment, but have very high turnover, as they are trading points for many of the goods that travel in and out of Nigeria from around West and Northern Africa. Turnover is estimated between 2.3 and 6.4 million Naira per month for these enterprises (compared to a typical microenterprise turnover of ₦50,000 per month), and trading volumes were severely affected by the floods. Each of these trading enterprises comprises an average of 2.5 shops and supports an estimated average of five livelihoods.²⁶

The same SMEDAN (2010) survey of MSMEs used to generate Table 3.13 also estimated employment within MSME sectors. Assuming a constant ratio of employ-

ment per business across the country, we can use the number of MSMEs in the flood-affected states to generate an estimate of employment, as in Table 3.14.

Both commerce and industry are dependent on physical premises and transportation systems. Physical premises are vital for capital-intensive manufacturing, but represent a much smaller proportion of turnover for traders. Industry cannot operate without efficient supply chains using heavy transport to deliver inputs in a timely fashion to the factory door and take factory product to market. Traders are less dependent on heavy transport, but nevertheless cannot operate without access to suppliers and markets.

Vulnerability and risk profile

Commercial and industrial enterprises have historically benefitted from proximity to waterways, and this explains the location of the commercial activity along the banks of the Niger. In particular, the low-lying "Harbour Industrial Layout" in Onitsha, Anambra state, is home to a large cluster of manufacturing industries and was severely affected by the flood. The SMEDAN survey of businesses reported that 36 percent of manufacturing companies and 35 percent of trading companies had insurance (SMEDAN 2010). However, a focus group meeting of 10 leading industrialists in Onitsha suggested that none had effective insurance against flooding.

Both insurance and location represent important areas of protection from future risk of flooding. While location may not easily be shifted, physical improvements, such as raising the level of machinery installations in

²⁵ Interviews with the Onitsha Chamber of Commerce and Manufacturer's Association of Nigeria, South East branch.

²⁶ Based on interviews with market traders, and with Director of markets, Ministry of Commerce and Industry, Anambra State.

the manufacturing plants, will be an important aspect of “building back better” initiatives.

Development of the vision of the sector

Nigeria’s Development Vision is expressed in the Vision 20:20 plan, and its defining overall goal is economic: to become one of the world’s top 20 economies in size by 2020, requiring the achievement of a GDP increase from US\$180 billion in 2009 to US\$900 billion in 2020. The First National Implementation Plan (2010-13) for Vision 2020 notes the currently small size of manufacturing but demands a “technologically driven and globally competitive manufacturing sector, with a high level of local content,” as well as an approach that will “reinvigorate and reposition the sector, to contribute substantially to the nation’s growth and development.”²⁷ The sector is energy-intensive and Nigeria’s poor power supply is its biggest constraint. Trade and Commerce is also central to the implementation of the Vision 20:20 plan, “...aimed at encouraging the production and distribution of goods and services... to satisfy domestic and international markets for the purpose of achieving accelerated growth and development.”²⁸ Targets include the doubling of Nigeria’s integration into the global economy by 2013 and promoting greater utilization of preferential trade opportunities, such as the African Growth Opportunity Act (AGOA). Both Trade and Industrial Policies are currently under review at the federal level.

Response to the Disaster

The flood event struck Onitsha on the night of September 22, 2012 and in the early hours of the following day. Business owners—both traders and manufacturers—had been warned some hours earlier of the impending flood event, but it was the larger business owners who were able to mobilize in order to mitigate losses. For example, Pokobros Group, covering chemicals, engine oils, agribusiness, plastics, motor parts, and a hotel, was able to deploy sandbags, raise walls, dig ditches, prepare water pumps, and transport movable assets. In total, the

company spent ₦14.7 million on these efforts; however, much of the effort was inadequate in the face of the high water levels, and the immobile nature of their most important assets. Following the disaster they relocated staff living in affected staff housing, and deployed their 1,500 staff in a major clean-up operation. Smaller businesses and those in other affected states would have been less likely to receive warning, and no additional reports of organized mitigation or recovery actions have been noted.

While some humanitarian response with participation by NGOs and government has been visible, manufacturers and traders both reported that the impact of floods on the private sector and urban livelihoods was relatively overlooked. Government officials and leaders made high-level visits to flood-affected areas, however no official assistance has yet been recorded. The southeast branch of the Manufacturers’ Association of Nigeria has provided some coordinated research and advocacy support for the manufacturing sector in the southeastern flood-affected areas by collating damage and loss information, for example, and appealing to state governments for support. At the national level, the Presidential Committee for Flood Response tasked the Manufacturers’ Association of Nigeria with collating information on impact and preparing an assistance package for members in affected states.

Disaster Effects and Impacts

Estimations were made of the value of destroyed assets belonging to manufacturing and commerce enterprises, together with estimations of subsequent losses in production and sales resulting from the interruption of activities in flood-affected states. To that end, questionnaires were sent out to the businesses in the affected states to determine the number of totally or partially-destroyed industrial and commercial facilities and to ascertain the period during which production and sales were interrupted. In addition, expert teams visited many of the affected states and LGAs to obtain primary information on these questions, to conduct individual interviews with owners or managers of affected enterprises, and to validate the data collected by state government authorities.

²⁷ Nigeria Vision 2020, First national Implementation Plan 2010-13, p.58-59.

²⁸ *Ibid.* p.76.

Data obtained thanks to this two-pronged approach was combined with baseline information on micro-, small- and medium-sized enterprises available in the 2010 MSME Collaborative Survey²⁹ that provides the most recent nationwide and state-disaggregated data on the number of establishments, value of capital and assets, monthly turnover, and number of employed persons in the different sectors of economic activity. In isolated cases in which the number of flood-affected establishments in a state could not be ascertained, the destruction ratio of housing (i.e., the number of houses destroyed versus the amount of housing stock per state) was applied to estimate the number of establishments destroyed. This formed the basis of damage and loss to small- and medium-sized commercial enterprises (Table 3.15), small- and medium-sized manufacturing enterprises (Table 3.16), and microbusinesses (Table 3.19) across the 12 flood-affected states.

Additional attention was given to Anambra state, where a significant cluster of manufacturing companies sustained severe damage, and where a large cluster of trading enterprises experienced significant trading losses. Damage and losses to large manufacturers in Anambra state (Table 3.17) were estimated on the basis of interviews with the Onitsha Chamber of Commerce and a focus group of 10 leading industrial companies that were affected. Two companies supplied detailed damage reports and an estimate for the level of damage per hundred employees was developed, then multiplied by the estimated size of the sector (200 companies with an average of 100 employees each).

The losses to Anambra's commercial sector (Table 3.18) were estimated on the basis of a survey of 200 traders, undertaken by the Anambra State Ministry of Commerce and Industry in November 2012 and used to ascertain typical and flood-affected monthly turnover figures, which form the basis of loss estimations. A baseline of the total number of trading enterprises was drawn from a recent enumeration in Anambra state.

²⁹ *Survey report on micro, small and medium enterprises in Nigeria*, National Bureau of Statistics (NBS) and Small and Medium Enterprises Development Agency of Nigeria (SMEDAN), Abuja, Nigeria, 2011.

The period of interruption of activities for the manufacturing sector has been assumed to be three months for SME Manufacturing and 12 months for Large Manufacturing enterprises. For the commerce sector, the period of interruption is estimated at 2.5 months, corresponding to the time required to rebuild the destroyed assets and to obtain working capital for each entrepreneur. In the case of agro-industries, however, production losses are expected to occur over a longer time period that will only end at with the following year's harvest.

Tables 3.15 and 3.16 on the following pages set out estimates of damage and losses for the SME Commerce sector and the SME Manufacturing sector. SME Commerce losses included the destruction of shops and storage areas and damage to stock. Damage was relatively more severe in the case of manufacturing companies, as expensive machinery was also destroyed, with longer-term impacts on operational losses. Table 3.17 focuses on the manufacturing sector in Onitsha, Anambra state, and Table 3.18 on the trading sector in that state. Table 3.19 provides information on the microsector across the 12 flood-affected states in which it is estimated that around 20 percent of the 5 million microenterprises were affected.

Social impacts

The social impact of the damages and losses discussed above are concentrated in two key areas: employment and income losses. In general, it is likely that the very large number of people involved in micro and trading enterprises will not suffer unemployment as a result of the flood. Experience has shown that small traders are able to recover relatively quickly from this sort of disaster and resume trade. However, income decline is likely to be severe in the short term. Assuming each microenterprise supports at least one livelihood, we can estimate that at least one million livelihoods will be affected by this event through the loss of around 2.5 months' income (Table 3.19). Some traders and small business owners have seen their premises and important equipment destroyed (at a rate ranging from 2 percent in Jigawa to 45 percent in Nasarawa), which

Table 3.15: Damage and Losses to the SME Commerce Sector by State, million Naira

	Adamawa	Anambra	Bayelsa	Benue*	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa*	Taraba	Rivers	Total
Number of wholesale/retail SMES	22	88	7	74	74	125	15	81	22	118	22	140	788
Destruction ratios ^{∞§}	0.29	0.13	0.39	0.09	0.04	0.02	0.22	0.13	0.45	0.27	0.21		
Number of affected SMEs	6	11	3	0	7	5	0	18	3	53	6	29	
Average value of assets, million Naira	3.17												
Average value of damage, million Naira	0.95												
Estimated value of damage, million Naira	45.0	80.7	19.2	-	47.0	35.3	2.1	125.6	20.2	374.4	41.9	207.3	998.5
Average monthly turnover, million Naira	6.33												
Period of operation interruption, months	2.5												
Estimated production losses, million Naira	101.0	181.0	43.2	-	105.4	79.1	4.7	282.0	45.3	840.3	94.0	465.3	2,241.3
Total, million Naira	145.9	261.7	62.4	-	152.3	114.4	6.9	407.6	65.4	1,214.7	135.9	672.5	3,239.8

* not field-visited

Source: Estimations by the Assessment Team using official information.

Table 3.16: Damage and Losses to Manufacturing Sector by State, million Naira (SME only)

	Adamawa	Anambra	Bayelsa	Benue	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa	Taraba	Rivers	Total
Number of SMEs	41	251	14	81	109	224	102	68	88	143	75	156	1,352
Destruction ratio ^s	0.29	0.13	0.39		0.09	0.04	0.02	0.22	0.13	0.45	0.27	0.21	
Number of affected SMEs	12	33	5	0	10	9	2	15	11	64	20	33	
Average value of assets, million Naira	29.8												
Average value of damage, million Naira	13.4												
Estimated value of damage, million Naira	125.8	345.2	57.8	-	103.8	94.8	21.6	158.3	121.0	680.8	214.2	346.6	2,269.9
Average monthly turnover, million Naira	6.33												
Period of operation interruption, months	3.00												
Estimated production losses, million Naira	226	620	104	-	186	170	39	284	217	1,222	385	622	4,074
Total Damage and Loss	352	965	161	-	290	265	60	442	338	1,903	599	969	6,344

Source: Estimations by the Assessment Team using official information.

Table 3.17: Damage and Losses to Manufacturing Sector in Anambra (Large Enterprises Only)

Company	Number of employees	Damage, million Naira		Losses, million Naira		Total, million Naira
		2012	2013	2012	2013	
Pokobros Group	1,500	821.0	821.0	215.1	645.3	860.4
Brollo Pipes	257	750.0	750.0	1,200.0	3,600.0	4,800.0
Other manufacturing (200)	Average 100 each	17,954.3	17,954.3	16,172.6	48,517.7	64,690.3
Total		19,525.3	19,525.3	17,587.7	52,763.0	70,350.7
						89,876.0

Source: Estimations by the Assessment Team using official information.

Table 3.18: Losses to Trader Businesses in Anambra (Micro by Employment, Medium by Turnover)

Approx. Number of Shops	Approx. Number of Enterprises	Average Lost Turnover per Enterprise	Average Length of Losses – months	Total Losses to Traders in Onitsha
106,000	42,000	2.1 million	2.5	228 billion Naira

will mean that their losses will be greater than just three months' income.

Employment impacts are therefore far less widely felt than are income losses, but the impact on individuals will be more severe, and the localized social and political effects may also be more clearly felt. Anecdotal evidence from a focus group of 10 leading industrialists in Onitsha suggests that large numbers of staff will become redundant. At the time of this discussion (late November 2012), most business owners were trying to retain staff despite their inability to pay them. This situation is unsustainable, however, and given the length of time before plants can reopen (likely up to a year, if they are not closed permanently in the meantime) means that the majority of staff will become unem-

ployed. This not only represents a loss to those individuals, but to the human capital of the manufacturing cluster as well, who have invested significantly in the skills of their workforce. It is estimated that around 200 firms averaging 100 employees each have been affected, representing a workforce of 20,000 people. These people have already lost almost three months' income, and many are likely to become unemployed in 2013. Such a large shock to the local labor market cannot easily be absorbed, especially when all other economic sectors continue to suffer the aftereffects of the flood. The SMEDAN Survey of MSMEs suggests that 42 percent of microbusinesses are female-owned and 30 percent of employees in the SME manufacturing sector are female.

Table 3.19: Damage and Losses to Micro Businesses, million Naira

	Adamawa	Anambra	Bayelsa	Benue*	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa*	Taraba	Rivers	Total
Number of micro-traders	405,281	499,070	420,233	438,381	488,023	481,220	438,502	388,714	473,882	488,885	380,882	585,241	5,488,314
Destruction ratio [§]	0.29	0.13	0.39		0.09	0.04	0.02	0.22	0.13	0.45	0.27	0.21	
Number of affected micro-traders	117,531	64,879	163,891	-	43,922	19,249	8,770	85,517	61,605	219,998	102,838	122,901	1,011,101
Average value of assets, million Naira													
Average value of damage, million Naira	0.05												
Estimated value of damage, million Naira	5,877	3,244	8,195	-	2,196	962	439	4,276	3,080	11,000	5,142	6,145	50,555
To be used	2,057	1,135	2,868	-	769	337	153	1,497	1,078	3,850	1,800	2,151	17,694
Average monthly turnover, million Naira	0.05												
Period of operation interruption, months	2.5												
Estimated production losses, million Naira	14,691	8,110	20,486	-	5,490	2,406	1,096	10,690	7,701	27,500	12,855	15,363	126,388
DAMAGE AND LOSSES	20,568	11,354	28,681	-	7,686	3,369	1,535	14,965	10,781	38,500	17,997	21,508	176,943

*not field-visited

Source: Estimations by the Assessment Team using official information.

These tables, summarized in Table 3.20 below, show that the losses to the large enterprises in Onitsha dwarf the losses to the SME manufacturing sector across the wider flood-affected region. Similarly, total trading losses to the microtrading sector and to the sector of larger trading enterprises in Onitsha are each almost twice the magnitude of combined losses in the small, medium and large categories.

Table 3.20: Comparing Losses by Sector

Detail	Value, million Naira
Damage and Losses to SME Commerce Sector – 12 states ³⁰	3.29
Damage and Losses to SME Manufacturing – 12 states	6.3
Damage and Losses to Large Manufacturing in Anambra state	89.8
Damage and Losses to Microbusinesses – 12 states	177
Losses to traders in Onitsha	228

Source: Estimations by the Assessment Team using official information.

3.3 Infrastructure Sectors

3.3.1 Water and Sanitation

Situation before the Flood Disaster

The water supply in Nigeria has yet to meet the MDG target of 75 percent coverage by the year 2015. It is estimated that around half of the total population in the country has access to an improved water supply, with less access in rural areas than urban (NBS 2007³¹; NPC 2008³²). Overall effective urban water supply coverage may reach as little as 30 percent of the total population, due to poor maintenance and the unreliability of supplies. Rural coverage is estimated at 35 percent. Although Nigeria has adequate surface and ground water resources to meet current demands for potable water, the temporal and spatial distribution of water has led to scarcity in some locations, especially

in the north. For example, access to an improved water supply in the country ranged from 42 percent in the northeast to 71 percent in the southwest (NBS 2007). Past government efforts have been fragmented, focusing on a subsectoral basis, but neglecting to manage it strategically as a national resource.

The situation of sanitation is even more precarious, as only 27 percent of Nigerian households have access to improved toilet facilities (NPC 2008), with the worst situation found in rural areas, particularly in settlements along riverbanks where people use rivers as source for drinking water and waste disposal site. Zonal disparity also exists in access to improved sanitation, which ranges from 29.6 percent in the northeast to 55 percent in the southwest (NBS 2007). Nigeria lacks a comprehensive strategy on sanitation as a whole, including excreta disposal, solid waste disposal, wastewater disposal, drainage, and treatment of wastewater. From the foregoing, Nigeria seems not to be on target to meet the MDGS with respect to sanitation and water supply by the year 2015 without making drastic investments (UNICEF 2010).³³

Effects of the Flooding

Many water facilities, such as open wells, dams, and boreholes, were affected by the flood. Available data shows that by September 2012, 25,247 water facilities had been affected, including: dams, open wells, tube wells, boreholes, hand pumps, solar panels, generators, generator houses, high- and low-lift pumps, cables, control panels, and water tanks. Also affected were 415,811 sanitary facilities, such as latrines and garbage containers. Table 3.21 shows the estimated damage sustained in terms of water and sanitation infrastructure in the twelve states under review.

³⁰ The 12 flood-affected states are listed in Table 3.12.

³¹ NBS. 2007. Multiple Indicators Cluster Survey (MICS); Abuja., NBS.

³² NPC. 2008. National Demographic and Health Survey; Abuja, NBS.

³³ UNICEF 2010. Joint Monitoring Programme (JMP) for Water and Sanitation.

Table 3.21: Physical Damage to Water Supply and Sanitation Facilities

S/No	State	Facilities	
		Water Supply	Sanitation
1	Adamawa	205	155,350
2	Anambra	191	25
3	Bayelsa	4,290	106,307
4	Benue	–	–
5	Delta	–	–
6	Edo	3,369	3,455
7	Kebbi	1,576	–
8	Kogi	126	–
9	Jigawa	208	105,000
10	Nasarawa	418	4,567
11	River	172	–
12	Taraba	14,692	41,107
Total		25,247	415,811

Source: Estimation by the Assessment Team on the basis of official information.

Estimates of Damage and Losses

Insufficient information was available to estimate the value of production losses and revenues. The total value of damage was estimated at ₦12.9 billion (see Table 3.22).

Table 3.22: Summary of Damage and Losses in the Most Affected States, million Naira

State	Damage	Losses ³⁴	Total Effects
Adamawa	3,418.3	–	3,418.3
Anambra	123.3	–	123.3
Bayelsa	2,844.9	–	2,844.9
Benue	9.9	–	9.9
Delta	18.3	–	18.3
Edo	317.6	–	317.6
Jigawa	3,949.4	–	3,949.4
Kebbi	570.2	–	570.2
Kogi	98.8	–	98.8
Nasarawa	118.5	–	118.5
Rivers	79.2	–	79.2
Taraba	1,354.8	–	1,354.8
Total	12,902.2	–	12,902.2

Source: Estimation by the Assessment Team on the basis of official information.

³⁴ No production losses or associated higher costs of operation were available.

3.3.2 Electricity

Situation before the Flood

The supply of electricity is insufficient to meet electricity demands from consumer sectors. Current installed capacity is estimated at a little less than 4,000 MW. It is governed mainly by the availability of gas to run thermal stations and the level of water at hydro-stations to propel the turbines. Consequently, Nigeria's electricity consumption on a per capita basis is among the lowest in the world. It has been estimated that a Nigerian citizen consumes 7 percent of the electricity consumed by a Brazilian and 3 percent of that consumed by a South African. More than half of the population has no connection to the grid whatsoever, relying on candles and kerosene for lighting. Due to the electrical system's lack of generation capacity, individual diesel and petrol generator capacity is estimated at 6,000 MW. It is further estimated that individual generators cost ₦50 – 70/KWh compared to the regulated price of ₦12/KWh for grid-supplied power. Nigerians spend between five and 10 times as much on self-generated light and power as they do on grid-supplied electricity. The strained electricity situation significantly accounts for the relatively poor performance of the manufacturing sector, small- and medium-size enterprises, commercial activities, etc.

The problem of power in Nigeria is one that has continued to plague successive governments. Until very recently, the Power Holding Company of Nigeria (PHCN) was the agency responsible for the generation, transmission, and distribution of electricity. It produces and distributes power through several subsidiary companies. These include 10 generation companies (GENCO), one transmission company (TRANSYSCO), and 11 distribution companies (DISCO). It offers services including: construction and engineering of power-generating units; maintenance and servicing of power grids; dam operations and water management for power generation, flood control, and navigation; resettlement; maintenance of control equipment, protections, and communications; maintenance scheduling; security and post-contingency analysis. Nigeria counts 10 power generation stations; three of them are hydropower and seven thermal (Table 3.23).

Table 3.23: Power Generation Companies in Nigeria

Name of Station	Type	Installed Capacity (MW)	Production (MWh)
Kainji	Hydro	760	260
Jebba	Hydro	600	578.4
Shiroro	Hydro	600	375
Egbin	Thermal	1,320	880
Sapele	Thermal	1,200	230
Afam	Thermal	921	75
Geregu	Thermal	414	83
Omotosho	Thermal	335	280
Olorunsogo	Thermal	335	320
Ughelli	Thermal	280	120

Source : FMP 2010.

Electricity distribution is managed by 11 DISCOs (Table 3.24) covering the entire country. These companies operate through Business Units that market electricity in smaller geographic areas in their respective zones. There are slight variations in the unit prices of electricity among the companies.

Table 3.24: Electricity Distribution Companies

DISCOs	Area of Coverage (States)
Abuja Electricity Distribution Company Plc.	FCT, Niger, Kogi, Nasarawa
Benin Electricity Distribution Company Plc.	Edo, Delta, Ondo, Ekiti
Eko Electricity Distribution Company Plc.	Lagos South
Enugu Electricity Distributions Company Plc.	Enugu, Imo, Anambra, Abia, Ebonyi
Ibadan Electricity Distribution Company Plc.	Oyo, Ogun, Osun, Kwara
Ikeja Electricity Distribution Company Plc.	Lagos North
Jos Electricity Distribution Company Plc.	Plateau, Benue, Bauchi, Gombe
Kaduna Electricity Distribution Company Plc.	Kaduna, Kebbi, Sokoto, Zamfara
Kano Electricity Distribution Company Plc.	Kano, Jigawa, Katsina
Port Harcourt Electricity Distribution Company Plc.	Akwa-Ibom, Cross River, Rivers, Bayelsa
Yola Electricity Distribution Company Plc.	Adamawa, Borno, Taraba, Yobe

Source: FMP 2010.

The power sector is one of the key focal areas engaging the attention of government. This has occasioned ongoing reforms in the sector, now open for investment. As part of the effort to improve the country's power supply, PHCN is currently being privatized. Upon completion of the privatization process, GENCOs and DISCOs will become separate entities. The Transmission Company of Nigeria, however, will remain under the government's control to ensure the regulation of pricing in conjunction with other electricity regulatory agencies. The country's entire electricity sector is subject to policy direction, standardization, and enforcement by the Federal Ministry of Power.

The electricity sector is highly vulnerable to disasters, including floods due to older installations, and the neglect suffered by the sector over the years. Maintenance has been a constant challenge, as is evident in the continuous drop in electricity output. In many cases, distribution lines are mounted on wooden poles that are often completely or partially burnt by bush fires or ravaged by termites and can easily be swept away by floods. Most distribution transformers are mounted on ground surface. While water may not represent a direct threat to transformers, they can be damaged when they are immersed in water over a long period, as occurred during the floods, especially in the southern parts of the country. The effects of the floods on the electricity sector will certainly be a factor in defining future developments and reforms.

Effects of the Flood on Electricity Generation, Transmission, and Distribution

The capacity to generate and transmit electricity was not affected by the floods, as no generating power plant or transmission lines sustained destruction or damage. Distribution, however, was partially affected when many transformers located at ground level became submerged and electricity poles and lines were destroyed, thus interrupting power supply to consumers. This interruption was not very sustained, however, as use was made of spare parts available at the electrical companies' warehouses and electricity supply was

restored in a relatively short time period, especially in urban areas.³⁵

Consumers were affected since, without the necessary electricity supply, many had to interrupt their production and social activities, sustaining production and income losses that have been estimated and accounted for under various consumer sector assessments. Additionally, demand for electricity from consumers declined in response to the destruction of housing units, manufacturing industries, and commercial establishments. Electricity demand from these consumer sectors will only recover to pre-disaster levels when the destroyed sectors have been rebuilt, which may take from three to 12 months. Undoubtedly, this fact will have a negative bearing on the finances of the electricity distribution companies over the same period of time.

Estimates of Damage and Losses

The value of damage to the sector's physical assets was estimated based on the cost of the equipment and parts that the power companies had in their inventory and that were used to replace the components destroyed by the floods. To estimate the losses, the Assessment Team adopted a two-pronged approach. On one hand, it estimated revenue losses sustained by the distribution companies during the relatively short time that the systems were down (no more than a few days). On the other, it estimated the revenues that would not be forthcoming due to the decline in electricity demand from all affected consumer sectors (residential, commercial, and industrial) over the time needed to reconstruct the destroyed premises. Towards this end, consultations were held with the assessment teams covering these other sectors to ascertain the time required for their full reconstruction. Furthermore, figures for the average daily sales of electricity to each of these sectors were obtained and combined with the average electricity consumption and individual tariffs to estimate the revenue losses that would arise from the disaster until full national reconstruction could be

achieved. The total value of damage to the sector is thus estimated at ₦329 million, and the value of revenue losses is considered to be ₦8,013.6 million more, bringing the total effect on the sector to ₦8,342.6 million (see Table 3.25).

Table 3.25: Estimation of Damage and Losses in the Electrical Sector

State	Disaster Effects, million Naira		
	Damage	Losses	Total
Adamawa	69.3		
Anambra			
Bayelsa	21.4		
Benue			
Cross Rivers	122.4		
Delta			
Edo			
Jigawa	7.7		
Kebbi			
Kogi	48.4		
Nasarawa	24.4		
Rivers	35.4		
Taraba			
Total	329.0	8,013.6	8,342.6

Source: Estimations by the Assessment Team on the basis of official information.

3.3.3 Transport Sector

Situation before the Flood Disaster

The transportation sector in Nigeria—consisting of three modes: Land (Road/Rail), Air and Water—has undergone significant transformation from pre-colonial times to the post-Independence era. Railway operations got under way in 1898, accompanied by the establishment of water transportation and the first construction of roads for motorized traffic in 1906. These early transport systems were designed and built with the minimal resource input possible, producing sub-standard roads and rail alignments, which soon proved inadequate in accommodating higher traffic volumes and heavier vehicles.

³⁵ The same was not true in rural areas, and the Assessment Team noticed that many areas were still without electricity. However, rural inhabitants are seldom connected to the grid.

The Road sector is the main driver of the national economy, accounting for over 90 percent of movement of passengers and freight. The road network hierarchy in Nigeria is categorized under three main headings: Federal Roads (Primary Roads), State Roads (Secondary Roads), and lastly Local Government Roads (Rural/Tertiary Roads). These roads are all constructed to different standards and specifications based on traffic analysis and engineering design. The Federal roads are of higher specifications, due to high traffic volume compared to the State and Local Government roads, which carry less traffic. The country has a National road network of about 200,000 kilometers, out of which only 65,000 km are bituminous roads while the rest are earth roads. Federal roads constitute 35,000 km of the 65,000 km bituminous roads, representing 54 percent of the entire bituminous road network. The balance (46 percent) of the national bituminous road network is owned and maintained by state and local governments.

Nigeria possesses a 3,500 km-long, narrow gauge (1.067-meter wide), single-track railway network, with light- and medium-weight rail, steel, and wooden sleepers. Low speeds, high costs and a generally unreliable service have led to a rapid decline in cargo and passenger traffic.

Nigeria has a total of 21 airports and 62 airstrips. There are five international airports, namely Abuja, Lagos, Port Harcourt, Kano, and Calabar. Passenger and cargo traffic have been growing steadily in recent years. The distribution of traffic is uneven, however, with the five international airports capturing almost 90 percent of the market. For cargo, the imbalance is even more extreme, with Lagos alone accounting for 90 percent of all cargo transport. It is therefore not surprising that only three airports are currently generating surpluses (Lagos, Abuja, and Port Harcourt).

The Nigerian Port Authority's (NPA) assets mainly consist of 13 major ports, 11 oil terminals, and 128 jetties, with a total annual cargo handling capacity of over 35 million tons. Nigeria has navigable inland waterways of about 3,000 kilometers, as well as a coastline of 852 kilometers of water transport.

Effects of the Floods on Transportation

Information regarding damage to all affected Federal roads was submitted by all states, with the exception of Rivers. Data on secondary and tertiary roads were also obtained from all states visited during the validation exercise, though not from Benue and Rivers states. With many roads down, local water transport witnessed increased patronage and served as a higher-cost alternative. It proved impossible to collect data related to this trend, however, because by the time the team was on the field the floods had receded and the users and operators of the systems had returned to their respective places of origin. Also, relevant data on vehicular stock was unavailable and has historically not been collected, and likewise information relating to any possible vehicular damage arising from the flood. Thus, traffic counts on the affected roads were not available to aid in assessing the losses arising from the floods. Furthermore, no historical records concerning vehicle operating costs and likely impact on the cost of travel on the affected routes were found.

There was no reported damage to the Rail and Air transport sectors, however the Road sector was very hard-hit (see Figure 3.3). The Federal road network had a higher resilience to the effects of the flood and suffered less damage than other categories of roads due to its higher specifications. However, the busy Abuja–Lokoja Road, which serves as a major link between the northern and southern parts of the country, was rendered impassable for several days as a result of the flood. The disruption of traffic along major Federal roads led to an increase in the cost of food items, the loss of perishable items, and to a disruption in the supply of goods and services to various parts of the country.

The capacity of the road transport sector—already strained under normal circumstances—was further impeded by massive flooding. The poor state of the roads significantly increased the time needed to supply flood victims with emergency relief materials. Air transport was used in many cases, but even so, reaching affected areas additionally required the use of roads and boats, severely hampering relief efforts.

Figure 3.3: A Submerged Road at Dougirei Area of Yola Adamawa State



Source: ynaija.com.

Estimates of Damage and Losses

Data on secondary and tertiary roads were also obtained from all the states visited during the validation exercise, though not from Benue and Rivers. Estimates of damage in the transport sector according to state are presented in Table 3.26. The damage to Federal roads is valued at ₦12 billion while damage to State and Local Government roads combined is estimated to be ₦24.9 billion.

3.4. Cross-Cutting Issues

3.4.1 Environment

Situation before the Floods Disaster

Nigeria has a total land area of 923,773 km² and is richly endowed with relatively abundant and diverse natural resources, both renewable and non-renewable. The country is blessed with mineral, physical, biological and energy resources. Nigeria contains nine ecological zones (Figure 3.4), ranging from a belt of mangrove swamps and tropical forests along the coast to open woodland and savanna on the low plateau, which extends though much of the central part of the country, and on to the semi-arid plains in the north and highlands to the east. The southern lowlands merge into the central hills and plateaus, with mountains in the southeast and plains in the north. The country's largest river is the Niger, which joins with the Benue River to form a confluence at Lokoja. From a coastal belt of swamps, stretching northwards the land becomes a continuous rainforest that gradually merges with woodland and savanna grasslands in central Nigeria. Nigeria presently has 11 sites designated as Wetlands of International Importance, with a total surface area

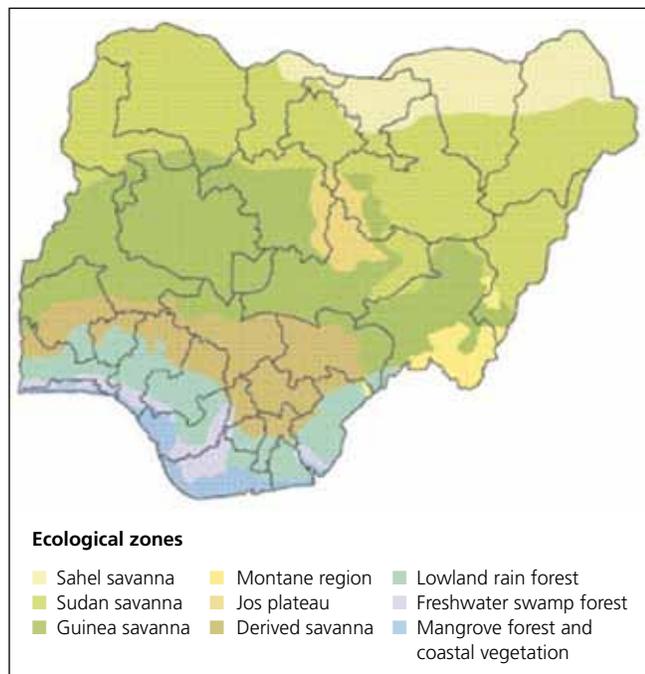
Table 3.26: Summary of Damage in the Transport Sector by State, million Naira

State	Primary Roads (Federal Govt. Road)	Secondary Roads (State Govt. Road)	Tertiary Roads (Rural Road)	Bridges	Culverts/ Drainages	Vehicular Stock	Total
Adamawa	119.2	1,350.0	690.0	175.2	7.5	0.00	2,341.8
Anambra	1,772.0	2,615.5	616.0	480.0	3.44	105.3	5,592.2
Bayelsa	303.8						303.8
Benue	2,005.3						2,005.3
Delta	1,345.0	6,000.0	0.00	0.00	2.9	0.00	7,347.9
Edo	2,471.6	551.5	6.1	0.00	1,690.2	0.00	4,719.3
Jigawa	443.2	672.7	815.4	0.00	0.00	0.00	1,931.3
Kebbi	24.5	5,250.0	35.0	0.00	65.0	0.00	5,374.5
Kogi	2,857.3	1,064.3	350.2	0.00	458.0	0.00	4,729.9
Nasarawa	124.7	2,099.0	637.0	601.5	156.0	0.00	3,618.3
Rivers							0.00
Taraba	233.6	1,876.4	165.0	549.2	0.00	0.00	2,824.2
Total	11,700.3	21,479.3	3,314.8	1,805.8	2,382.9	105.2	40,788.4

Source: Estimation by the Assessment Team on the basis of official information.

of 1,076,728 hectares. Within the wetlands is the Niger Delta; covering around 20,000 km² it is the largest wetland and maintains the third-largest drainage basin in Africa. The country has abundant freshwater resources. These vast freshwater ecosystems are distributed all over the country (though unevenly) from the coastal region to the arid zone of the Lake Chad Basin. The forest reserve of Nigeria makes up less than 10 percent of the total land area, with undisturbed forest covering only 12,114 km² and representing approximately 1.3 percent of the total land area. Nigeria has eight National Parks that are well endowed with diverse flora and fauna resources, covering a total of about 4,293,800 ha and located in different parts of the country, including Cross River, Gashaka-Gumti, Kamuku, Kainji Lake, Okomu, Old Oyo, and Yankari.

Figure 3.4: Nigeria's Ecological Zones



Source: FME 2005.³⁶

Nigeria's climate is characterized by strong latitudinal zones that become progressively drier as one moves northwards from the coast. Rainfall is the key climatic variable and there is a marked difference between wet

and dry seasons in most areas. Variable but heavy across much of the country, rainfall occurs throughout the year with an annual total decreasing from over 3,800 millimeters at Forcados on the coast to under 650 mm at Maiduguri in the extreme northeast of Nigeria. The length of the rainy season also decreases from nearly 12 months in the south to less than five months in the north. Nigeria's climate is characterized by relatively high temperatures throughout the year. The average annual maximum varies from 35°C in the north to 31°C in the south; the average annual minimum temperature varies from 23°C in the south to 18°C in the north. On the Jos plateau and the eastern highlands, altitude causes relatively lower temperatures, with a maximum of no more than 28°C and the minimum sometimes as low as 14°C. The effect of these high temperatures is high evapo-transpiration rates, and this eventually brings about water shortages for arable cropping. In the south, the rain forests and woodlands benefit from abundant precipitation and relatively short dry seasons. The northern part of Nigeria experiences a dry season of five to seven months and lies mostly in the Sudan and Sahel Savanna zones.

Among the critical environmental problems facing Nigeria is flooding, which occurs throughout the country in three main forms: coastal, river, and urban. Profound along the Niger River through Benue basin and Sokoto basin, flooding significantly affects natural environmental assets and services. During the rainy season, most major rivers with flood plains are subject to flooding. Urban flooding occurs in towns located on flat or low-lying terrain (Niger Delta areas), especially where little or no provision has been made for adequate surface drainage, or where existing drainage has been blocked with municipal waste, refuse, and eroded soil sediments. About 28 percent of Nigeria's population live in the coastal zone and face the risk of flooding. The areas that are severely impacted by flooding include the coastal areas of Lagos, Ondo, Delta, Bayelsa, Rivers, Akwa Ibom, and Cross River states. Other related issues that are of environmental concern are:

- a) Displacement of fauna and flora from the wetlands, water bodies etc.;

³⁶ Federal Ministry of Environment (FME), *National Biodiversity Strategy and Action Plan (NBSAP)*, Abuja, 2005.

- b) Presence of physico-chemical and microbial indicators of fecal and effluent in rivers;
- c) Stress resulting from the displacement of indigenous aquatic species;
- d) Disruption of settlements in close proximity to water bodies, as well as the importing of debris into water bodies; and
- e) Discharge of hazardous effluents, medical, and municipal wastes in water bodies and thereafter impacting unrestricted areas of human habitat.

Effects of the 2012 Floods on the Environment

The recent floods have devastated much of the landscape of affected communities and cities. The health of waterways was negatively impacted as many rivers, creeks, and Niger Delta tributaries were eroded, contaminated, and littered with debris. The erosion of river banks and flood plains is of particular concern for freshwater resources. Many riparian zones were damaged from rapid-flowing water, which stripped away vegetation and exposed soils, making them more prone to rapid erosion from future rains. Soils and waterways may have been contaminated by chemicals from nearby industrial and commercial premises, oil-producing facilities, etc. The high volumes of fresh

water, sediments, nutrients, pesticides, and other contaminants in waterways pose a huge threat to marine life. Mangrove habitats are particularly susceptible as they act as nets, catching sediment and all sorts of debris, often causing damage to their root systems. Moreover, the impact of floods has considerable environmental and health consequences, in particular given the very specific vulnerability of domestic water supplies and the physical infrastructure necessary for sanitation. The disruption of water distribution and sewage systems during floods contribute greatly to financial and health risks.

Estimates of Damage and Losses in the Environment Sector

The value of damage to environmental assets was obtained by determining the extent of forest resources destroyed by the disaster. Losses occurred in biodiversity protection, timber production, carbon fixing, recreation, and erosion. Table 3.27 shows the summary of damages and losses sustained by the natural environment due to the 2012 floods. Estimates of environment-related flood damage and losses amount to ₦23.8 billion and ₦13.5 billion, respectively.

Table 3.27: Summary of Damages and Losses in the Environment Sector, million Naira

State	Damages		Losses	
	Media	Cost	Media	Cost
Anambra	Forest	8,000.0	Carbon fixing	12.0
	Land	600.0	Bio-diversity protection	182.5
	Other Assets		Recreation	3,500.0
			Water cycle regulation	3.7
			Erosion	1.5
			Timber production	3.0
Delta	Forest	6,124.3	Carbon fixing	5.0
	Land		Bio-diversity protection	–
	Other Assets		Recreation	1.0
			Water cycle regulation	2.5
			Erosion	15.0
			Timber production	5.0
Kebbi	Forest		Carbon fixing	
	Land		Bio-diversity protection	
	Other Assets		Recreation	
			Water cycle regulation	
			Erosion	4,888.6
			Timber production	
Kogi	Forest	300.0	Carbon fixing	
	Land	5,102.0	Bio-diversity protection	
	Other Assets		Recreation	
			Water cycle regulation	
			Erosion	1,200
			Timber production	
Jigawa	Forest	94.8	Carbon fixing	
	Land	3.9	Bio-diversity protection	7.5
	Other-Solid waste system	0.3	Recreation	
			Water cycle regulation	
			Erosion	1,065.1
			Timber production	
Adamawa	Forest		Carbon fixing	
	Land		Bio-diversity protection	
	Other Assets		Recreation	
			Water cycle regulation	
			Erosion	6,265.4
			Timber production	
Taraba	Forest	1,600.0	Carbon fixing	
	Land		Bio-diversity protection	
	Other Assets		Recreation	
			Water cycle regulation	
			Erosion	
			Timber production	
Total		23,840.1		17,167.00

Source: Estimation by the Assessment Team on the basis of official information.



Photo: Curt Carnemark / World Bank

CHAPTER 4: HUMAN RECOVERY NEEDS ASSESSMENT

4.1 Affected population

4.1.1 Total affected population

The incidence of the 2012 flood was nationwide: it occurred in 35 out of the 37 states of the Federal Republic, covering 3,870 communities in 256 LGAs. Of these, Table 4.1 shows that 395,631 households in 116 out of 291 LGAs in 14 states (representing about 2.769 million people) were most severely impacted. This population constitutes the primary target of assistance.

4.1.2 Vulnerable groups in affected households

The affected communities contained population groups that were especially vulnerable or at risk due to the effects and impacts of the flood. These include the disabled, the elderly, pregnant and lactating mothers, and infants and children. The composition of household members according to the various vulnerability groups presented in Table 4.2 shows the preponderance of the elderly and infants and children. This indicates that a sizeable proportion of the households of the flood victims are in the category of the weak and vulnerable.

Table 4.1: LGAs, Households, and Population in Most-Affected States

States	Total population Est. (2012)	Number of LGAs per state	Total population in affected LGAs	Number of LGAs affected	Total affected population in LGAs	Number of affected households
Adamawa	3,764,021	21	1,470,990	9	189,706	27,101
Anambra	4,932,272	21	1,177,199	8	89,909	12,844
Bayelsa	2,023,760	8	1,770,790	7	387,360	55,337
Benue	5,040,516	23	1,497,707	5	62,303	8,900
Delta	4,950,041	25	2,359,262	13	483,517	69,074
Edo	3,774,746	18	838,832	4	20,505	2,929
Imo	4,752,575	27	388,343	2	1,587	227
Jigawa	5,166,630	36	3,564,528	18	491,843	70,263
Kebbi	3,890,292	21	2,654,871	14	362,355	51,765
Kogi	3,916,641	21	1,641,503	9	199,511	28,502
Kwara	2,832,619	15	521,215	3	12,468	1,781
Niger	4,832,087	25	2,452,419	15	248,934	35,562
Plateau	3,728,276	17	1,304,916	8	123,316	17,617
Taraba	2,733,504	16	1,025,064	6	96,100	13,729
Total	56,337,979	291	22,667,640	116	2,769,415	395,631

Source: Joint Assessment Report on Flood Damage and Loss for Agriculture and Food Security Response and Rehabilitation, 2012, FAO, WFP, NEMA, SEMA, FMWR, NPC, UNDP, IAR, ABU.

Table 4.2: Household Composition by Vulnerable Group in Surveyed States (%)

Vulnerable category	South-South region			South-East region			South-West region		North-Central region		North-East region	North-West region
	Bayelsa	Delta	Rivers	Anambra	Imo	Oyo	Ogun	Kogi	Niger	Taraba and Adamawa	Jigawa	
Disabled	7.8	9.2	20.0	0	0	14.4	7.9	4.8	13.9	4.0	3.3	
Elderly	24.7	25.6	26.0	37	42	75.1	56.5	23.9	29.1	14.1	60.1	
Pregnant	31.5	19.6	14.0	13	10	26.3	37.7	7.7	24.8	8.9	23.0	
Lactating	23.1	14.0	10.3	22	17	47.1	26.1	5.2	13.3	2.6	10.7	
Infants (under 12 months)	26.8	11.2	1.7	17	13	38.7	36.6	14.7	25.1	30.0	39.1	
Children (under 5 years)	69.2	20.4	22.6	56	49	57.2	55.3	24.8	29.9	40.3	57.7	

Source: HRNA Community Consultation and Verification Survey 2012.

Table 4.3: Main Sources of Drinking Water before and after the Flood

Water source	South-South region			South-East region			South-West region		North-Central region		North-East region	North-West region
	Bayelsa	Delta	Rivers	Anambra	Imo	Oyo	Ogun	Kogi	Niger	Taraba and Adamawa	Jigawa	Zamfara
Main source before the flood	Public tap	Public tap	Public tap	Surface water	Public tap	Protected well	Piped water to dwelling	Piped water to dwelling	Surface water	Rainwater collection	Piped water to dwelling	Protected well
Main source after the flood	Public tap	Public tap	Public tap	Surface water	Rainwater collection	Unprotected well	Piped water to dwelling	Surface water	Surface water	Rainwater collection	Surface water	Unprotected well
Increased use after the flood	Surface water	Piped to dwelling	Tanker truck	Rainwater collection	Rainwater collection	Protected well	Public tap	Surface water	Surface water	Rainwater collection	Tanker truck	Unprotected spring
Reduced use after the flood	Public tap	Protected well	Unprotected well	Protected spring	Surface water	Unprotected well	Tanker truck	Piped water to dwelling	Piped water to neighborhood	Piped water	Protected spring	Protected well
	Protected dug well	Tanker truck	Rainwater	Protected dug well	Protected well	Protected well	Tanker truck	Piped water to dwelling	Piped water to neighborhood	Piped water	Protected spring	Protected well

Source: HRNA Community Consultation and Verification Survey 2012.

4.2 Effects on household demographics

4.2.1 Age dynamics

The flood affected the dependency ratio of communities. In most of the states surveyed, there was a change in the composition of households, with older people assuming the responsibility of household head in the wake of the disaster due to the departure, disability, and sometimes death of youths in states such as Kogi, Niger, and Zamfara. For example, in Bayelsa, Delta, and Rivers, the proportion of households with heads older than 50 years increased after the flood. In either case, the flood placed an increased dependency burden on affected households.

4.2.2 Gender of household head

Gender factors determine development patterns, vulnerability to natural hazards, coping strategies, and community response to disasters. The comparative analysis of the situation before and after the disaster showed mixed outcomes. Some of the states surveyed experienced an increase in the number of female-headed households in the aftermath of the disaster (such as Kogi and Niger). However, in other surveyed states, such as Anambra and Jigawa, there was little change to the composition of the household and gender of the head (Anambra, Imo, and Jigawa).

4.3. Sector effects

4.3.1 Water and sanitation

Communities in the affected states obtain water from various sources, including: piped water to dwellings, surface water (rivers, streams, dams, and ponds), piped water to the neighborhood and public taps, protected and unprotected wells, protected and unprotected springs, and tanker trucks. The major source of water varies according to the geographic zone, general level of development, and socio-economic condition within the community. The major sources of and variations in use within the communities surveyed before and after the flood are presented in Table 4.3. Based on these

findings, it would appear that in most of the states there was no change in the major source of water, although the level of use may have varied relative to others after the flood. For example, public taps were the major source in the three states of the South-South region both before and after the flood, but reliance on other sources increased after the disaster. In general, across all communities, recourse to unsafe water (mainly surface water, unprotected springs, and collected rainwater) increased, while use of safe sources (including tap water and protected wells) declined in the wake of the flood.

In addition, survey results demonstrated a general indication of reduced access to water for drinking and domestic use, as flood victims had to travel longer distances and spend more time collecting water after the disaster.

The sanitation of the victims was also affected. Analysis of the toilet facilities used by respondents before and after the disaster shows that the situation worsened as a result of the flood disaster. The survey indicated that in Anambra, Imo, Kogi, Niger, and Jigawa the proportion of households that used household toilets declined, while the use of open areas increased. This situation is likely to apply across all the states impacted by the flood.

Furthermore, use of other sanitary facilities such as soap, detergents, water, and sanitary napkins became inadequate in the aftermath of the disaster.

4.3.2 Health

Despite the flood's potential to cause serious disease effects, the HRNA survey showed that, overall, while the health of affected victims was impacted, the disaster did not result in a significant change to the health concerns of the people in several of the communities surveyed. For example, about 79 percent of households questioned in Oyo and 61 percent in Ogun states indicated that their members did not experience health problems associated with the flood. Similarly, under one-third of the affected households surveyed in Kogi

The results of the survey were corroborated by the matrix of disease impacts generated by the Health Sector Team. These are presented in Table 4.4, which highlights the potentiality of communicable diseases as a result of the flood disaster.

For all respondent households, their main sources for the provision of health services both before and after the floods are public hospitals and clinics, with some slight variations. For example, in the southeast, patronage of drug retail shops increased among sampled households in Anambra, while use of public facilities increased in Imo state.

Table 4.4: Communicable Diseases of Immediate and Long-term Concern

Communicable disease	Immediate concern	Longer-term concern
Cholera/Typhoid/Shigellosis	+++	
Acute lower respiratory tract infections	+++	
Hepatitis A & E	++	
Leptospirosis	++	
Measles	++	
Malaria	++	+++
Tuberculosis	++	++
Dengue fever	+	+
Meningitis	++	++
Poliomyelitis	++	++
HIV/AIDS	++	++

Note: More number of signs denote higher concern. Source: PDNA Health Sector Team Report, December 2012.

However, recourse to traditional sources for the provision of health services increased in some states. In Adamawa and Taraba, 30 percent of respondent households turned to traditional sources during this period. Use of such services increased for 40 percent of households following the disaster. In Zamfara, use of traditional sources increased for 55 percent of the households surveyed, while those utilizing public facilities declined to 23 percent of respondents.

The main problems associated with the use of health facilities, as reported by the victims, include the inadequacy of health workers, the unavailability of medicine, the high cost of services, and overcrowding. Table 4.5 presents the basic issues identified in various regions.

Table 4.5: Problems Related to Use of Health Services after the Flood

Region	Main problems
North-Central	unavailability of medicines high cost of services
South-East	overcrowding high cost of services unavailability of medicines
South-West	high cost of services unavailability of medicines
North-East	high cost of services unavailability of medicines inadequate health workers

Source: HRNA Community Consultation and Verification Survey 2012.

4.3.3 Education

The flood disaster had a negative impact on the education of the children of victims, due to several effects. The most obvious effect was the destruction of and damage to school infrastructure. As indicated in Chapter 3.1.2, Anambra accounted for 40.7 percent of the affected primary schools (42.3 percent of those partially damaged and 35.2 percent of those totally destroyed). The physical effect on school infrastructure negatively impacted school attendance in the immediate aftermath of the flood, but to varying degrees, as shown in Table 4.6.

In addition to infrastructure effects, various other factors posed problems contributing to reduced school attendance by children in affected communities. Table 4.6 shows that the major problems children faced in attending school were: loss of school materials to the flood, inadequate learning materials at schools, and the higher cost of attending school. Despite these

Table 4.6: Levels and Factors of Reduction in School Attendance by Children in Affected Households Due to the Flood

State	Percent of reduction in primary school attendance	Problems of schooling in affected communities (and % of households indicating that factor)
Oyo	1.6	<ul style="list-style-type: none"> ■ loss of school materials in the flood (72.4%) ■ increase in cost of attending school (2%) ■ teachers not going to school regularly (2%)
Ogun	45	<ul style="list-style-type: none"> ■ loss of school materials in the flood (23%) ■ increase in cost of attending school (16%) ■ inadequate learning materials (6%) ■ teachers not going to school regularly (5%)
Anambra	19	<ul style="list-style-type: none"> ■ loss of school materials in the flood (45%) ■ increase in cost of attending school (16%) ■ inadequate learning materials (27%) ■ teachers not going to school regularly (13%) ■ damaged access roads (11%)
Imo	24.5	<ul style="list-style-type: none"> ■ loss of school materials in the flood (48%) ■ increase in cost of attending school (16%) ■ inadequate learning materials (26%) ■ teachers not going to school regularly (5%) ■ damaged access roads (19%)
Kogi	18.4	<ul style="list-style-type: none"> ■ loss of school materials in the flood (42%) ■ increase in cost of attending school (3%) ■ inadequate learning materials (40%) ■ teachers not going to school regularly (7%) ■ takes longer to get to school (9%)
Niger	9.3	<ul style="list-style-type: none"> ■ loss of school materials in the flood (39%) ■ increase in cost of attending school (5%) ■ inadequate learning materials (45%) ■ teachers not going to school regularly (8%) ■ takes longer to get to school (3%)
Adamawa and Taraba	10	NA
Jigawa	18.5	NA

Source: HRNA Community Consultation and Verification Survey 2012.

problems, attendance rates should improve, as information from the Education Sector Team indicates that schools have now re-opened in all the affected states.

4.3.4 Shelter and settlement

The most apparent effect of the flood was the inundation of settlements and shelter, which caused widespread damage and losses to housing to varying degrees, as described in Chapter 3.1.1. At the household level, the HRNA survey provided some evidence

of the degree of damage in some of the most affected areas, as shown in Table 4.7.

Despite the widespread damage to housing that resulted in temporary displacement, the majority of those whose shelters were affected in all the surveyed states indicated that they were back living in their own homes, including those damaged. Consequently, there was little evidence of permanent or long-term relocation of the displaced; most are still living in their areas of usual habitation.

Table 4.7: Proportions of Household Indicating Extent of Damage to Houses (% of respondents)

Degree of damage	South-South region			South-East region		South-West region		North-Central region		North-East region
	Bayelsa	Delta	Rivers	Anambra	Imo	Oyo	Ogun	Kogi	Niger	Taraba and Adamawa
No damage	0	34	10	5	7	8	47	20		0
Negligible or slight damage	24	20	87	10	20	37	15	8	9	4
Slight structural damage, can be repaired	44	45	53	41	33	2	14	24	13	10
Moderate structural damage and heavy non-structural damage	31	71	13	25	24	29	22	9	6	14
Very heavy non-reparable damage	24	42	38	10	3	24	2	9	3	23
Total / complete destruction	0	38	34	9	13	0	0	30	23	50

Note: Households often comprise more than one house.

Source: HRNA Community Consultation and Verification Survey 2012.

4.3.5 Household energy

The disaster also affected household energy. Fuel wood constituted the dominant source of energy both before and after the flood, although there was a decrease in household consumption of fuel wood energy from both forest and garden/orchard sources. In some states, the dominance of fuel wood as the primary source of household energy declined, with a shift to kerosene oil stoves (e.g., Rivers, Balyesa, and Delta) and shrubs and grasses (e.g., Zamfara).

4.3.6 Transport and communication

Adequate energy and good access to communication and transport services are central to the proper functioning of settlements and human well-being. The primary means of communication both before and after the disaster is the Global System for Mobile communication (GSM). Regarding physical mobility, there was reduced access to motor vehicular transport following the disaster; as such, the percentage of victims who used motor vehicles decreased, while those who walked increased.

4.4 Disruption and restoration of institutions and services (governance)

Disasters often weaken governance systems and negatively impact all of their functional components, such as public administration, civil services, and law enforcement at the local level. Public administration infrastructure and services may suffer heavy physical damage, as well as economic, human, and social losses, which make local social and economic support infrastructure dysfunctional, thereby disrupting the provision of basic public services, such as water supply, electricity, drainage, health, education, waste management, and communication.

The DaLA showed that flood effects were more concentrated in the private sector than in the public sector. This implies that public sector functions were not seriously impaired by the flood disaster. Nonetheless, the subjective impressions of those interviewed provide an indication of the duration of disruption of public services in the aftermath of the disaster. For example, the proportion of households having indicated that government services were still functioning at the time of the survey in Kogi was as follows in Table 4.8.

Table 4.8: Proportion of Households Indicating that Government Services were Functioning at the Time of the Survey

Service	North-Central region	
	Kogi (%)	Niger (%)
Schools	5.3	61
Hospitals/clinics	1.5	14.2
Water	11.5	3.2
Electricity	6.9	1.8

Source: HRNA Community Consultation and Verification Survey 2012.

The survey in the South-East region also provided an indication of affected government functions in Anambra and Imo states, as follows in [Table 4.9](#).

Table 4.9: Extent of Households' Access to Government Services Functioning at the Time of the Survey in Some States (%)

Service	South-East region	
	Anambra (%)	Imo (%)
Limited access to water	13	10
Limited access to health care	9	11
Limited access to transportation	12	10
Local government functions	4	6
Police/security	8	6.4
Education – schools	12	12.6
Electricity	7.5	11
Nothing	10	11
Don't know	24.5	22

Source: HRNA Community Consultation and Verification Survey 2012.

Strengthening the institutional management of services is a public governance responsibility. The evidence was that most services were not completely disrupted and resumed very soon after the disaster. For example, 87 percent of household respondents in Kogi and 69 percent in Niger states indicated that the duration of government service disruption was between one and four weeks. And, as stated elsewhere in this report,

all first cycle schools in affected areas have been re-opened. With regard to electricity, the floods further hampered the ability of PHCN to generate and distribute electricity for consumption; even before the floods, generation fell far short of installed capacity. It was very difficult to estimate the gap in supply while the floods lasted, because no information on this subject was available. However, this gap did not last for long, as supply was restored following the floods.

4.5 Effects on income, food security and livelihoods

4.5.1 Livelihoods

The affected communities derive their livelihoods from a wide range of sources, reflecting variation in their socio-economic characteristics. The affected areas are major agriculture-producing zones in Nigeria, with agriculture and forestry being the dominant sources of livelihood in almost all the states. In addition, in the South-West region, wholesale and retail trading is an important source of livelihood in Oyo and Ogun states, as well as in the South-East region states of Anambra and Imo. The survey indicated that there were no significant changes in livelihood sources for sampled households as a result of the flood. However, there was a slight reduction in agriculture, forestry and fishing as main sources of livelihood in Kogi and Niger states after the flood. Also, some households increased their recourse to other livelihood sources, such as mining and small trading (Zamfara) and part-time teaching (cases noted in Adamawa and Taraba).

4.5.2 Household income

The sources of livelihood did not change after the flood but the disaster disrupted the livelihood mechanisms of affected communities, resulting in loss of family income to varying extents. Given the extensive damage and loss of livelihood assets, smallholder farmers, communities dependent on small-scale fishing, the landless poor dependent on wage labor in agriculture, skilled and unskilled workers previously employed in a wide range of small and medium manufacturing and pro-

Table 4.10: Proportion of Households in Some States Indicating Various Levels of Income Loss (%)

Category of loss	South-East region		South-West region		North-Central region		North-East region
	Anambra	Imo	Oyo	Ogun	Kogi	Niger	Taraba and Adamawa
Completely lost	31	40	0.0	0.2	63.2	48.0	28.6
About 76% lost (most)	25	27	0.0	3.7	23.9	17.6	
51-75% lost (a large proportion)	21	19	32.9	0.6	9.0	17.9	19.2
26-50% (some, nearly half)	21	14	44.2	25.7	0.0	10.4	7.9
1-25% (a little)	2	0	3.1	54.9	3.9	3.7	15.0
None	0	0	19.5	14.9	0	0	12.5*

*16.9 of households indicated they did not know the extent of income loss.

Source: HRNA Community Consultation and Verification Survey 2012

cessing enterprises all lost income-earning opportunities for some period of time.

The PDNA estimated employment and income impacts of the flood in the most affected states, which show that income losses are highest for the trade and commerce sector, relative to those in agriculture and the fisheries. This has implications for the gender impacts of the flood. The negative impacts on female entrepreneurship will be significant, as 42 percent of micro businesses are female-owned and 30 percent of employees in the SME manufacturing sector are female. Significant proportions of surveyed households lost their income as a result of the flood (See Table 4.10).

4.5.3 Food security

These levels of income impacts had negative consequences for the food security status of households. Prior to the disaster, the majority of those surveyed obtained their food and other sources of livelihood from their own farm produce. In the post-disaster period, however, market purchase became the main source of food for between 60 and 98 percent of the affected households sampled in all the states, while between 1 and 10 percent relied on food assistance from the government, donors, and their neighbors.

In the aftermath of the disaster, increases in market prices of commodities were also reported by nearly

all of the respondents. This commodity price inflation and the following factors exacerbated the food insecurity of impacted populations: (a) crop and livestock losses; (b) loss of stored food; (c) increased reliance on market for food (reduced own-produce consumption), and greater recourse to government assistance; (d) reduced access to markets, (e) reduced duration of domestic food reserves from about one to six months to under one to two months (for those still maintaining reserves); and (f) loss of livelihood to provide income to access food.

4.6 How the affected communities are coping with the livelihood and income effects of the disaster

4.6.1 Post-flood income coping and food security strategies

Communities and households have developed various coping and survival mechanisms along with strategies to manage a wide range of vulnerabilities within the rural milieu. These vary by source of stress, agro-climatic zone of adoption, level of incidence of the measures (individual, household, community), or type of response (risk minimization or avoidance).

Financial coping strategies adopted to cope with the loss of household income as a result of the flood, as shown in Table 4.11.

Table 4.11: Percent of Households Adopting Various Strategies to Cope with Income Loss

Type of coping strategy	South-East region		South-West region		North-Central region		North-East region
	Anambra	Imo	Oyo	Ogun	Kogi	Niger	Taraba and Adamawa
Run-down of savings	42	52	43.1	31.4	20	28.3	30.9
Selling of assets	6	20	30.2	10	8.4	22.4	28.6
Working as usual			14.8				
Borrowing from formal financial institutions	2	0		5.9	4.5	2.4	19.6
Borrowing from informal financial institutions	12	6	11.6		26.5	13.9	0.9
Part-time/alternative employment	10	4	0.2	34.6	19.4	22.1	18.9
Remittances	5	2		0.4			0.9
Others (support from relatives, etc.)	23	16		17.6	21.2	10.9	

Source: HRNA Community Consultation and Verification Survey 2012.

Based on the results presented in Table 4.11, the dominant strategies for coping with the financial impact of the flood have been: run-down of saving, selling assets, and part-time or alternative work. The reduction of assets and savings and the increase in debt have implications for households' consumption and food security, investment, and ultimate recovery.

Arising from the various constraints, victims had to resort to a series of food security coping strategies. The major ones include: reliance on less-preferred food, food borrowing, gift of food from others, reduction in the number of daily meals, skipping meals, reduction of food portion sizes, reduction of consumption by adults in favor of children, and purchase of food on credit.

4.6.2 Child labor

Child labor plays a role as a coping strategy among poor households. However, the effect of the flood on the practice of children working varies by location. In Ogun, Oyo, and Niger states, respondent households did not indicate any significant change in the number of children working in households or the length of time they worked per week in the aftermath of the flood. The situation is different in Kogi state; whereas the number of households with children working did not

change significantly, more children worked for money, with some working more hours per week in the wake of the flood disaster. At the other end of the spectrum, both Anambra and Imo noted an increase in the number of households in which children were working, as well as in the length of time devoted to work.

4.7 Other human impacts

4.7.1 Psychosocial, safety, and protection considerations

Disasters often constitute a public health problem, due to the possibility of increased mental and psychological health concerns and anti-social behaviors among affected populations, caused by continuing danger, loss, anxiety, trauma, and changed or uncertain social conditions. Moreover, disasters expose the most vulnerable in affected populations to the negative effects of social relations and actions. Therefore, in the context of human health, it is important to identify any psychological distress that may arise as a result of, or may be exacerbated by, the flood disaster.

The evidence on this subject was mixed. Respondents in some states expressed little fear for their own safety, but this was in fact a critical issue in communities

where affected households felt more insecure in their homes after the flood (Anambra and Imo, Oyo, Ogun, Kogi, and Niger). The reasons adduced by respondents for their insecurity were gendered. Men attributed their sense of insecurity to the perceived possible collapse of a damaged house, a poor housing environment, fear of future economic uncertainty, recurrence of the flood, and increase in reptiles in the community. Women attributed their fear to the prevalence of disease, poor housing conditions, inadequate access to food, and trauma. As for children, their sense of insecurity was attributed to poor housing conditions (e.g., falling walls of damaged houses), reptiles, and trauma. In Ogun state, uneasiness among the few households having expressed such concerns had more to do with the fear of robbery than with the effects of the disaster per se. In Kogi state, 60 percent of the households questioned showed deep anxiety about the security of their possessions, particularly as most respondents (91 percent in Oyo, at least 60 percent in Adamawa and Taraba, 61 percent in Ogun, 37 percent in Kogi, 19 percent in Niger) indicated that they had lost various important documents due to the flood.

Another social dimension of the flood's impact was the incidence of behavioral changes, noted particularly in the South-South region. Changes in the behavior of children (noted in 47 percent of households in Anambra and 28 percent in Imo states) were attributed to flood-induced trauma, deterioration in the living environment, and disruptions in food intake. These factors, in addition to the frustration caused by their inability to provide for their households, accounted for noticeable changes in the behavior of adults in 22 percent of households in Anambra and 35 percent in Imo.

4.7.2 Disaster-induced conflict

Conflicts often arise in the wake of natural disasters and due to environmental factors, such as limited resources. They tend to exacerbate the effects of natural hazards by further weakening populations already under stress, thereby increasing disaster-related risks. An exception to this trend was noted in the context of the flood disaster, as respondent households reported

little evidence of increased conflict (e.g. Rivers, Balyesa, Delta, Kogi, Niger). This experience was not universal, however; 56 percent of respondents in Oyo and 61 percent in Adamawa and Taraba reported increased conflict due to the flood. Sources of tension included disputes over the distribution of donated items, family quarrels, differences over business interests, and conflicts over the use of land that was not flooded.

4.8 Likely impacts on human development indicators and MDGs

Assessment of the impact of disasters on various indices of human development constitutes a key element of HRNA in PDNAs. This HRNA did not explicitly undertake Flood Impact on MDGs Analysis (FIMA). Nonetheless, it is possible to discern some potential impacts on key MDGs, such as those relating to poverty and hunger (MDG1), universal primary education (MDG2), child mortality (MDG4), and the incidence of diseases (MDG 6).

4.8.1 Eradication of extreme poverty and hunger (MDG 1)

Floods reduced access to food supply at the household level due to damage to shelter, savings, household food stocks, productive assets, and roads connecting people to markets. This contributed to undernourishment at least in the short to medium term. There is also the risk of an increased severity in undernourishment for those already malnourished, partly due to the effect of increased prices as a result of the floods. Price effects are also likely to accentuate this. To the extent the price level for staples remains inflated over the short to medium term, nutritional status, health, and overall economic productivity would likely be negatively impacted, thereby exacerbating food insecurity. Furthermore, the flood had negative direct employment impacts. As shown in the HRNA survey, the flood disrupted the livelihoods of affected people. The DaLA estimated that equivalent employment losses due to damages and losses amounted to nearly 400,000 employment years of both salaried and self-employed workers in the 12 states visited.

4.8.2 Universal primary education (MDG 2)

As noted by the Education Sector Team, the floods have reduced the effectiveness of the education system, mainly due to inadequate learning environments resulting from the loss of classrooms. Regarding survival rates, the Nigeria 2010 MDG Report noted that, while gross and net enrolment rates are increasing, survival rates are dropping. The flood would not have helped this situation, as some children have dropped out partly due to damaged school buildings, their inability to use roads leading to schools, and the loss of uniforms and learning materials. Also, some are likely to drop out due to loss of teaching time, which could affect their progress.

4.8.3 Infant mortality, maternal health and diseases (MDGs 4, 5, 6)

As indicated in the Health Sector report, the floods would have likely affected the achievement of MDGs in impacted states, as malaria was expected to increase and the interruption of services for days or weeks would cause serious setbacks to patients receiving chronic treatment for TB and HIV. Also, access to obstetrics care in affected areas would be reduced, given the damage to facilities, resulting in longer referral times.

4.9 Implications for recovery

4.9.1 Communities' recovery efforts: auto-recovery

Affected populations are not waiting for government support before returning to their homes; they have either already returned or are planning to in the near future. It is therefore imperative that they receive support now, in order to rebuild and recover their houses and livelihoods, and to permit them access to basic services that were disrupted by the flood disaster.

However, the survey showed that victims are making few recovery efforts. Current actions being taken by the victims to recover from the disaster include seeking alternative jobs (38.7 percent), rehabilitating destroyed

houses (16.0 percent), relocating (6.1 percent), and seeking assistance from relatives and friends (16.0 percent). However, it was determined that roughly 23.3 percent of the victims are doing nothing to recover from the disaster, indicating the need for external assistance. Also, a high proportion of the victims (60.0 percent) reported that they are not doing anything to prevent future flood disasters, while 21.2 percent do not know what to do at all. The relatively slow pace of auto-recovery underscores the need for programmed recovery assistance.

4.9.2 Communities' subjective expressions of priority recovery assistance needs

Assistance is needed to enable the victims to recover quickly from the impact of the disaster. This assistance must be partly based on the subjective perceptions of the impacted populations. The survey elicited these perceptions.

Findings show that the floods had negative impacts on the lives, assets, and livelihoods of the victims. The array of problems they face in the aftermath of the disaster is varied and diverse. It includes water shortage, poor sanitation and toilet facilities, transportation problems, lack of access to markets and healthcare facilities, food shortages, poor and inadequate shelter, inability to repair damage shelter, inadequate clothing/footwear, as well as loss of livelihood, among others. The overall recovery needs to be addressed should be keyed to these major problems faced by victims of the flood. Table 4.12 shows the relative ranking of the major problems as identified by surveyed households. The unavailability of adequate potable water and food were the most pressing problems identified at the time of the survey. Transportation was the top-most problem identified by those surveyed in Delta and the second in Rivers state.

Table 4.12: Ranking of Major Problems Faced by Affected Households after the Disaster

Major problem	Ranking by Respondents in States													
	South-South region			South-East region			South-West region			North-Central region		North-East region	North-West region	
	Bayelsa	Delta	Rivers	Anambra	Imo	Oyo	Ogun	Kogi	Niger	Taraba and Adamawa	Jigawa	Zamfara		
Drinking Water	1	1	4	2	2	1	2	2	2		2	4		
Sanitation/toilet facilities	3				7	2	3	4	4		6			
Food	2			1	1	5	1	1	1	1	1	1		
Restoration of livelihoods	4	2	4	5	5	7			6			6		
Immediate shelter	5	5	1	4	4			3	5	3	7	6		
Repairing damaged house	6		5	3	3	6				4	5	3		
Clothing, footwear, bedding				6		4	4	5	3		3	2		
Fuel and cooking material		4	3	7			5							
Health care	7	3	5	5		3	6	6		2	4	5		
Children returning to school		6			6					5				
Transportation		1	2							6				

Key: 1 reflects highest rank.

Source: HRNA Community Consultation and Verification Survey 2012.

Table 4.13: Priority Measures Suggested by Respondents to Prevent Flood Disaster

South-East region	South-West region		North-Central region	
	Anambra State	Imo State	Kogi State	Niger State
Construction of proper drainage systems	Dredging of rivers	Early warning	Early warning	Relocation
Prayer for moderate rain	Early warning	Government quick evacuation response	Dam creation	Afforestation
Prevent waste disposal into drainages and river channels	Construction of drainage facilities	Dredging of rivers	Afforestation	Early warning
Demolition of buildings close to rivers	Relocating communities	Construction of drainage facilities	Relocation	Dam creation
	Walling of the banks of rivers			
	Government quick evacuation response			

Source: HRNA Community Consultation and Verification Survey 2012.

Overall, the fact that shelter and livelihood were not the topmost priorities for the majority of respondents is partly a reflection of timing, since the survey was conducted during the relief phase when victims expressed the intention to return to their homes and the recognition that the flood was an episodic and infrequent event. The ordering of priorities also reflects the nature of the social system in place, which enjoins people to accept needy family and neighbors into their household.

4.9.3 Communities' subjective expressions of priorities in reducing future flood disasters

The negative impact of the floods on vulnerable livelihoods is expected to have long-term consequences with respect to: (i) greater exposure to risk of disasters/shocks (e.g., through displacement, loss of housing, and damage to ecosystems); and (ii) reduced coping capacity among affected households. In view of the vulnerability factors identified by respondents, affected communities were asked in the survey to suggest measures for minimizing future flood disaster occurrences in their areas. Suggested actions include relocation to safer areas, an afforestation program, the creation

of water-holding dams, and the provision of effective early-warning services. The measures suggested by respondents to prevent future flood disaster risks are presented in Table 4.13.



Malam Abubakar Naibi is involved in fish farming in the village of Suleja in Niger State. The activity was supported by Nigeria's Fadama II project. Photo: Arne Hoel / World Bank

CHAPTER 5: RECOVERY AND RECONSTRUCTION NEEDS

5.1. Introduction

To ensure full recovery from the negative impact of the disaster, below are a number of recommended program interventions and their corresponding financial needs. Financial needs for the recovery and reconstruction program have been estimated based on the assessment of damage and loss caused by the floods. These needs are expressed in a disaggregated manner, taking into consideration breakdowns by subsector as well as regional needs.

Economic Recovery Needs are defined on the basis of the estimated value of losses in economic flows and are organized according to three main sub-programs: (i) recovery of personal or household income; (ii) rehabilitation of basic services to the population; and (iii) recovery of production. They are grouped under the major sector classification of social, productive, and infrastructure.

Reconstruction Needs are defined on the basis of the estimated value of damage while adopting a strategy that seeks to introduce disaster-resilient standards, depending on the availability of funding. A “building-back-better” strategy requires quality and technological improvement, relocation of selected activities to safer areas, improved design and construction standards, structural retrofitting, and adequate flood-control measures and schemes.

5.2 Social Sector

5.2.1 Personal Income Recovery

A “cash-for-work” sub-program in combination with basic services rehabilitation that makes extensive use of unskilled labor are envisaged as a means of enabling the population that has seen their income decline and/

or their food stocks destroyed by the floods to at least secure a minimum income over the time required to restore production activities and household revenue. The duration of this temporary program could range from three to six months, or until the next crop can be harvested. Based on the value of personal income decline, as described in the section of this report that deals with such subjects, it has been estimated that total needs for this sub-program are ₦69 billion. If “food-for-work” or food donation sub-programs are introduced separately, requirements for the “cash-for-work” sub-program should be reduced accordingly. The importance and priority of this sub-program cannot be over-emphasized, as these families’ survival depends on its implementation.

5.2.2 Housing

Recovery and Reconstruction Needs

Table 5.1 lists the estimated costs of recovery and reconstruction. A total sum of over ₦42 billion will be needed for recovery efforts in the housing sector, while over ₦620 billion will be needed for reconstruction. A total of ₦662 billion is needed in the housing sector. This comprises ₦42 billion for recovery and over ₦619 billion for reconstruction needs.

Two types of recovery activities have been envisaged: demolition, cleanup, and the environmentally-safe disposal of mud and debris (₦3,600 million); and the provision of funding to cover the cost of temporary housing for affected families while their homes are under reconstruction and while standards for disaster-resilient housing units are being developed, the duration of which has been estimated at six months (₦38,800 million).

Under the reconstruction sub-program, an urgent technical cooperation activity is required to define a new

Table 5.1: Estimates of Recovery and Reconstruction Needs, million Naira

State	Recovery Needs	Reconstruction Needs	Total
Adamawa	13,298.5	85,594.5	98,893.0
Anambra	11,496.5	50,176.8	61,673.3
Bayelsa	1,124.9	105,289.8	106,414.9
Delta	1,243.7	46,881.4	48,125.2
Edo	270.7	9,302.8	9,573.6
Jigawa	187.8	8,702.5	8,890.3
Kebbi	1,354.5	63,779.6	65,134.2
Kogi	1,194.6	76,807.1	78,001.8
Nasarawa	1,415.9	39,416.9	40,832.8
Rivers	455.4	84,741.4	85,196.8
Taraba	10,365.8	49,224.9	59,590.7
Total	42,408.7	619,918	662,327

Source: Estimations by the Assessment Team using damage and loss information.

house design that will enable flood risk reduction before actual house reconstruction gets under way; urgent training is also required to ensure that homes are built according to new designs and standards. An estimated cost of ₦3,600 million is envisaged for this purpose. In order to assist poor families in the reconstruction of their homes using the new housing design, a program that combines cash grants and in-kind donations of construction materials is to be executed at an estimated cost of ₦355,800 million. This amount covers the value of construction materials and each homeowner family would provide the labor required. For credit-worthy homeowners, a sub-program of soft-term credit with low interest rates and long repayment periods suited to post-disaster conditions is envisaged and should be channeled through development and private banks at an estimated cost of ₦252,400 million.

Lastly, certain housing units among communities located in flood plain areas that are considered unsafe (even assuming the use of the newly developed design) are to be relocated to safer areas at an estimated cost of ₦8 billion, which will be utilized to purchase land and install minimum base service of water, sanitation, and electricity.

5.2.3 Education

Recovery and Reconstruction Needs

The detailed cost of recovery and reconstruction across in the Education Sector is presented in Table 5.2. The total cost of recovery and reconstruction for primary and secondary education is estimated at ₦116,169.8 million.

The education sector demands four types of recovery activities: demolition and debris/mud disposal in affected schools; provision of special, psychosocial attention to affected teachers and students; temporary rental of premises to substitute for schools that are either being used as shelter camps or are under reconstruction; and the cost of measures to compensate for education time to students due to the temporary interruption of the school year induced by the floods. Reconstruction needs have been estimated for the repair and reconstruction of damaged or destroyed schools,³⁷ as well as for the replacement of equipment, furniture, and education materials destroyed by the floods.

³⁷ School reconstruction and repair costs have been estimated at 130 percent of the estimated value of damage, to include disaster-resilient standards and norms in the new buildings.

Table 5.2: Estimation of Post-disaster Needs for Recovery and Reconstruction in the Education Sector by State, million Naira

	Adamawa	Anambra	Bayelsa	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa	Rivers	Taraba	Total
Recovery needs	732.0	3,785.5	1,195.2	703.0	36.7	415.6	118.6	523.2	7,005.3	573.0	123.1	15,211.2
Cleanup costs	14.9	87.1	20.4	13.8	1.1	14.6	4.3	17.6	180.7	3.4	5.7	363.6
Psychosocial attention	296.8	855.2	232.8	162.4	9.6	133.2	44.8	126.0	1,054.0	111.2	43.2	3,069.2
Overtime teachers	415.8	2,780.4	939.6	524.4	25.2	257.4	67.2	354.6	5,353.8	458.4	68.4	11,245.2
Temporary rentals	4.5	62.8	2.4	2.4	0.8	10.4	2.3	25	416.8	0	5.8	533.2
Reconstruction needs	5,950.1	24,691.8	10,619.8	4,877.4	388.8	4,984.5	1,624.3	5,179.5	39,834.1	904.8	1,903.5	100,958.5
Reconstruction of destroyed schools	731.3	3,627.0	429.0	351.0	156.0	1,690.0	373.8	2,990.0	37,407.5	–	942.5	48,698.0
Repair of schools	3,268.9	13,228.8	6,910.8	3,026.4	124.8	1,488.5	578.5	851.5	2,164.5	904.8	325.0	32,872.4
Equipment and materials	1,950.0	7,836.0	3,280.0	1,500.0	108.0	1,806.0	672.0	1,338.0	262.1	–	636.0	19,388.1
Total needs	6,682.1	28,477.3	11,815.0	5,580.4	425.5	5,400.1	1,742.9	5,702.7	46,839.4	1,477.8	2,026.6	116,169.8

Source: Estimations by the Assessment Team on the basis of damage and loss information.

Table 5.3: Estimation of Needs for Health Sector, by State, million Naira

Description	Adamawa	Anambra	Bayelsa	Benue	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa	Rivers	Taraba	Total
Recovery needs													
Cleanup/ disinfection costs	222.4	222.4	1,245.6	133.5	177.9	89.0	89.0	133.5	1,423.6	44.5	533.8	133.5	4,448.6
Temporary clinics	1.6	1.6	9.0	1.0	1.3	0.6	0.6	1.0	10.3	0.3	3.9	1.0	32.2
Health care	99.5	99.5	556.9	59.7	79.6	39.8	39.8	59.7	636.5	19.9	238.7	59.7	1,989.0
Prevention campaigns	120.5	120.5	674.7	72.3	96.4	48.2	48.2	72.3	771.1	24.1	289.2	72.3	2,409.8
Reconstruction needs	0.9	0.9	4.9	0.5	0.7	0.4	0.4	0.5	5.6	0.2	2.1	0.5	17.6
Hospital/clinics reconstruction*	704.8	1,582.1	4,032.6	41.1	3,264	983	331.0	--	1,905.9	973.9	9,633.6	116.1	23,568.0
Replacement of furniture/ equipment**	323.2	897.4	2,448.8	18.0	1,701.3	580.5	197.5	855.9	855.9	508.7	7,144.7	65.8	14,741.9
Replacement of medical supplies**	105.6	268.2	716.7	5.9	522.4	189.6	64.5	279.6	279.6	166.2	2,014.8	21.5	4,354.9
	276.0	416.5	867.1	17.3	1,040.3	212.8	69.0	770.5	770.5	299.0	474.0	28.8	4,471.2

Source: Estimations by the Assessment Team using damage and loss information.

5.2.4 Health

Recovery and Reconstruction Needs

Four types of activities are proposed to achieve recovery to normal levels in the provision of healthcare to the affected population: debris/mud removal and disposal and disinfection of affected hospitals and clinics; establishment and operation of temporary clinics in lieu of affected centers; provision of healthcare to an increased number of people after the floods, and disease-prevention and vector control campaigns. Reconstruction needs for the health sector include hospital and clinic reconstruction,³⁸ as well as replacement of destroyed furniture, equipment, and medical supplies.³⁹ The estimate required for recovering the health sector is ₦4,448.6 million, while the total amount required for reconstruction is ₦23,568.0 million.

5.3 Productive Sectors

5.3.1 Agriculture

Recovery and Reconstruction Needs

Estimations of financial needs for recovery were made assuming that farmers having lost their crop production and existing food stocks at the time of the floods would require food assistance until the next harvest, relying as well on the provision of seeds, fertilizer, and pesticides that would enable them to plant and collect the next crop in 2013. In the case of affected livestock owners, the FMARD and FAO had envisaged the provision of an assistance package that would include 10 immunized pullets, 1 mature cockerel, 2 goats or sheep, and veterinarian care for their animals, at an estimated unit cost of ₦60,000 each. For the case of affected fisher families, a recovery package was also envisaged that would provide 1,000 fingerlings and 1,000 kilograms of starter feed at an estimated cost of ₦153,000 each. On the basis of the affected num-

³⁸ Clinic and hospital reconstruction costs have been estimated at 140 percent of the estimated value of damage, to factor in disaster-resilient standards in the new buildings.

³⁹ Replacement costs for furniture, equipment, and medical supplies have been estimated at 115 percent of the estimated value of damage, to account for improvements in quality and modernization of each item.

ber of farmers, livestock owners, and fisher families, and given the unit costs of each package, the recovery needs were estimated as shown in Table 5.4.

Table 5.4: Estimated Needs for Recovery and Reconstruction in the Agriculture, Livestock, and Fishery Sector

Recovery needs	million Naira
Food assistance to farmers that lost food stocks ⁴⁰	-
Provision of agriculture inputs for planting next crop	54,594
Recovery package for livestock	22,538
Recovery package for fishery	37,106
Total recovery needs	114,238
Reconstruction of Irrigation Infrastructure and Equipment	1,600

Source: Estimations by Assessment Team using damage and loss data.⁴⁰

Under agriculture, the only cost of reconstruction is that of rebuilding and repairing irrigation channels and equipment that were destroyed by the floods, whose functioning is essential to ensuring full water availability during the dry season in 2013. In that sense, these reconstruction works are urgently required to avoid additional production losses in crops that require irrigation. The cost of irrigation system reconstruction is estimated at ₦1,600 million. The cost of restoring the animal stock and aquaculture facilities are already included in the recovery needs provided by the MARN.

5.3.2 Trade and Manufacturing

Recovery and Reconstruction Needs

The value of recovery needs was estimated on the basis of a fraction of sales losses arising from the floods.

For the case of affected traders—micro-traders, and SMEs only, since no large traders were reportedly af-

⁴⁰ The value of food assistance envisaged by the GoN was not made available for the assessment.

affected—needs are also represented by working capital to acquire goods to sell and meet some operational requirements and to reschedule non-performing loans. The recovery needs include cash grants to micro-entrepreneurs and soft-term credit lines for credit-worthy traders channeled through the private banks.⁴¹

For industries, the recovery needs refer to working capital requirements and non-performing loan rescheduling to ensure the recovery of production for the affected small, medium and large industries. The funding is to be channeled through special, soft-term (in both interest rate and repayment terms) credit lines that should be made available through the development and private banks. The value of these recovery needs was estimated as a fraction of the estimated production losses caused by the floods.⁴² Reconstruction needs were estimated on the basis of the value of damage and have been increased to provide disaster resilience through improved structure design to ensure flood-proofing and, in some cases, provide for storage of raw materials and produced goods in safer, elevated places, plus locating machinery and equipment in similar spaces on the premises.

The estimated values of the recovery and reconstruction needs for commerce and industry are ₦4,017 million and ₦33,415 million, respectively (Tables 5.5 and 5.6).

⁴¹ An analysis of the operational characteristics of affected traders obtained through sample interviews, the amount of working capital and loan rescheduling was estimated as 10 percent of the sales losses of micro-traders and as 25 percent of losses of SMEs.

⁴² After an analysis of the characteristics of industries that were affected and on the basis of interviews conducted with a sample of owners and managers of affected manufacturers, the amount of working capital and loan rescheduling was estimated as 35 percent of the production losses of SMEs and as 25 percent of the losses of large industries.

5.4 Infrastructure

5.4.1 Water and sanitation

Reconstruction Needs

Reconstruction requirements for destroyed or partially damaged water supply and sanitation systems result from increasing the value of damage by 30 percent in order to introduce flood-resilient design and construction standards. No recovery needs were estimated, since no data on production losses were available.

The reconstruction needs for the water and sanitation sector are estimated at ₦18 billion (see Table 5.7).

5.4.2 Electricity

Recovery and Reconstruction Needs

The strategy for reconstruction and recovery is hinged on three imperatives: restoration of basic services, rehabilitation of supporting infrastructure, and replacement of equipment that was completely destroyed. Considering that the effect of flooding on the electricity subsector was not too devastating, restoration of the electricity supply was almost immediately effected after the floods by the DISCOs. However, rehabilitation and replacement of installations in some cases is still ongoing. The financial needs for reconstruction efforts are estimated at ₦337.3 million, as presented in Table 5.8.

5.4.3 Transport Sector

Recovery and Reconstruction Needs

In the road transport sector, reconstruction requirements include those of the federal government-owned primary roads, state-owned secondary roads, state-owned tertiary roads, and bridges and culverts. These amounts include slight increases with respect to the estimated value of damage to factor in improved, flood-resilient standards, especially in the case of bridges and drainage structures.

Table 5.5: Recovery and Reconstruction Needs in Commerce Sector, million Naira

	Adamawa	Anambra	Bayelsa	Benue	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa	Rivers	Taraba	Total
Recovery needs													
Working capital financing	321	175	421	-	127	51	39	179	146	530	347	216	2,553
Cash grants for micro-enterprises	220	122	307		82	36	16	160	116	412	230	193	1,896
Soft-term credit lines for SMEs	101	53	114		45	15	23	19	30	118	116	24	657
Reconstruction needs													
Repair & reconstruction	225	118	254	-	99	34	51	43	68	262	259	52	1,464
SMEs	225	118	254		99	34	51	43	68	262	259	52	1,464
Total needs	546	293	676	-	226	85	90	222	213	792	606	269	4,017

* Assuming 33% are insured

** Assuming 50% are insured

Table 5.6: Recovery and Reconstruction Needs in the Manufacturing Sector, million Naira

	Adamawa	Anambra	Bayelsa	Benue	Delta	Edo	Jigawa	Kebbi	Kogi	Nasarawa	Rivers	Taraba	Total
Recovery needs													
Working capital financing	79	4,614	36	-	186	60	-14	-99	76	428	218	135	5,944
SMEs	79	217	36		186	60	-14	-99	76	428	218	135	1,547
Large		4,397											4,397
Reconstruction needs													
Repair and reconstruction	170	24,873	78	-	140	128	29	214	163	919	468	289	27,471
SMEs	170	466	78		140	128	29	214	163	919	468	289	3,064
Large		24,407											24,407
Total needs	249	29,486	114	-	326	188	43	313	239	1,347	686	424	33,415

Source: Estimations by the Assessment Team using damage and loss information.

Table 5.7: Recovery and Reconstruction Needs in Water and Sanitation Sector, million Naira

S/No	State	Reconstruction Needs (N)
1	Anambra	173.5
2	Adamawa	4,844.9
3	Bayelsa	4,050.9
4	Benue	NA
5	Delta	NA
6	Edo	452.6
7	Jigawa	5,628.8
8	Kebbi	788.3
9	Kogi	113.8
10	Nasarawa	168.0
11	Rivers	112.0
12	Taraba	1,910.1
Total		18,243.4

Source: Estimations by the Assessment Team on the basis of damage and loss data.

Table 5.8: Rehabilitation and Reconstruction Needs in the Electricity Sector, million Naira

State	Description	Value (N)
Anambra	No information	
Adamawa	Replacement of damaged electrical accessories & distribution lines	79.7
Bayelsa	Replacement of poles & cables	24.6
Benue	No information	–
Delta	No information	–
Edo	No information	–
Jigawa	Replacement of poles & transformer	8.8
Kebbi	No information	–
Kogi	Replacement of transformers, poles, & fittings	55.6
Nasarawa	Replacement of generators & fittings	28.0
Rivers	Replacement of transmission lines & fittings	140.5
Taraba	No information	–
Total		337.3

Source: Estimations by the Assessment Team using damage and loss information.

Table 5.9: Estimation of Transport Sector Reconstruction Needs, million Naira

	Primary roads (federal govt. road)	Secondary roads (state govt. road)	Tertiary roads (rural road)	Bridges	Culverts/ drainages	Total
Adamawa	155.0	1,755.0	897.0	227.8	9.7	3,044.4
Anambra	2,303.6	3,400.1	800.8	624.0	4.4	7,133.0
Bayelsa	349.9	0	0	0	0	349.9
Benue	2,606.9	0	0	0	0	2,606.9
Delta	1,748.5	7,800.0	0	0	3.7	9,552.2
Edo	3,213.0	716.9	7.9	0	2,197.3	6,135.1
Jigawa	576.1	874.4	1,060.0	0	0	2,510.6
Kebbi	31.8	6,825.0	45.5	0	84.5	6,986.9
Kogi	3,714.5	1,383.6	455.3	0	596.4	6,149.8
Nasarawa	162.2	2,728.7	828.1	781.9	202.8	4,703.8
Rivers	0	0	0	0	0	0
Taraba	303.7	2,439.3	214.5	713.9	0	3,671.5
Total	18,932.8	36,300.0	5,601.9	3,052.0	4,028.4	52,844.2

Source: Estimations by the Assessment Team on the basis of damage and losses.

The sum of ₦52,844.2 million would be required for the reconstruction of the sector, as shown in Table 5.9. In the absence of losses information, no recovery needs were estimated for this sector.

5.5 Cross-Cutting Issues

5.5.1 Environment

Recovery and Reconstruction Needs

Needs for the rehabilitation and reconstruction of the environment include four types of activities: planting of trees, forest rehabilitation, reconstruction of drainage systems, and rehabilitation of recreational facilities.

Totals for the estimated needs are presented in Table 5.10.

Table 5.10: Environment Sector Reconstruction and Recovery Needs, million Naira

Needs	Value
Forest rehabilitation	12,770
Afforestation	1,597
Drainage system reconstruction	8,000
Recreation centers rehabilitation	200
Total	22,567

Source: Estimations by the Assessment Team on the basis of damage and losses.



CHAPTER 6: DISASTER RISK MANAGEMENT IN NIGERIA

Nigeria is one of the most disaster-prone countries in Africa, being extremely vulnerable to droughts, floods, landslides, gully erosion, and wind storms. This section provides an overview of historic and potential disasters in the country, as well socio-economic factors that contribute to making Nigeria continuously vulnerable to disaster impacts.

6.1 Disaster profile

The number of disasters reported in Africa has increased significantly since the 1970s. Over the last four decades, Sub-Saharan Africa has experienced more than 1,000 disasters, with 300 in the past five years alone. Since then, more than 330 million people have been affected by droughts, floods, cyclones, earthquakes, and volcanoes across the continent (EM-DAT 2012). Disasters in Sub-Saharan Africa are predominately hydro-meteorological and climatological in nature, and mostly comprise cyclones and storms, floods, landslides, extreme temperatures, wildfires, and droughts. Geological disasters, such as earthquakes and volcanoes, occur to a lesser extent. Droughts affect the greatest number of people on the continent, followed by floods and storms. Droughts and floods together account for 80 percent of loss of life and 70 percent of economic losses linked to natural hazards in Sub-Saharan Africa (African Union et al. 2008).

Nigeria experiences its fair share of disasters. Table 6.1 and Figure 6.1 below provide an overview of the most severe natural disasters and the most frequent types of disaster having affected Nigeria between 1980 and 2010. Northern Nigeria, which stretches towards the Savannah and Sahel belt of the neighboring Republics of Niger and Chad, has regularly been affected by droughts. The 1983 drought affected more than 3 million people in the country (EMDAT 2012).

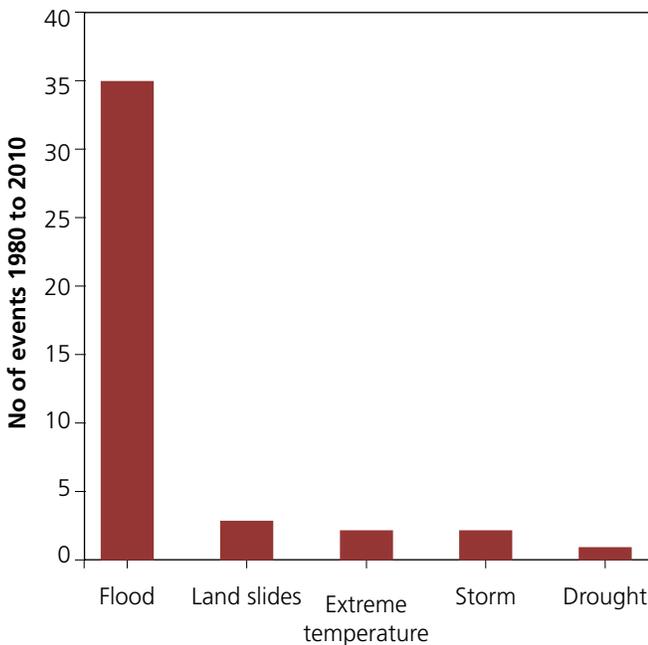
The 2012 drought felt across the Sahel also affected several thousand people in the northern states. The major areas that typically receive very severe drought impacts are those within the Sudan/Sahel belt. These include areas north of latitude 11°N, comprised of Borno, Yobe, Adamawa, Taraba, Sokoto, Bauchi, Katsina, Kano, Gombe, Kebbi, and Zamfara states.

Flooding along the Niger and Benue Rivers and their tributaries affects large parts of the population living along the river banks. Flooding has also become a frequent phenomenon in major urban centers such as Lagos, Port Harcourt, Kano, and Ibadan. Expanding settlements into wetlands areas, disregard for existing environmental and town planning regulations, and limited drainage capacities have fueled this trend in recent years. The floods in Ibadan in 2011 killed more than 100 people and substantially affected local infrastructure. In other parts of the country, weak infrastructure (mainly dams) has contributed to the flooding problem. In 2010, for example, the Goronyo dam spillage affected thousands of people in Sokoto and Kebbi states. Landslides and extreme gully erosion have substantially impacted infrastructure and livelihoods of parts of southeastern Nigeria, with Anambra state being the most affected. There are an estimated 3,000 gullies, which can measure up to 10 km long, with multiple tributaries spreading through the rural or urban landscape.

Table 6.1: People Affected in the 10 Most Severe Disasters, 1980–2010

Disaster	Date	People affected
Drought	1983	3,000,000
Flood	1988	300,000
Flood	1994	580,000
Flood	1998	100,000
Flood	1999	90,000
Flood	2001	84,065
Flood	2003	210,000
Flood	2007	50,000
Flood	2009	150,000
Flood	2010	1,500,200

Figure 6.1: Occurrence of Disasters per Disaster Type, 1980–2010



Source: EM-DAT.⁴³

Other disasters in the country include disease outbreaks and epidemics, such as cholera, malaria, meningitis, measles, Lassa fever, yellow fever, and more recently,

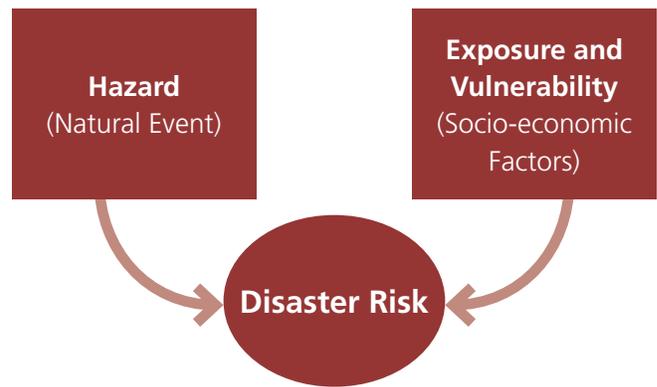
⁴³ The OFDA/CRED International Disaster Database, Universite catholique de Louvain, Brussels, Belgium. Available at www.preventionweb.net

the Avian Influenza virus (H5N1) in 2005. The country has also experienced many cases of collapsed buildings in major cities such as Abuja, Lagos, and Port Harcourt.

6.2 Understanding Disaster Risk in Nigeria

Disaster risk can be understood as a combination of hazard or a potentially damaging physical event, with the increased vulnerability of the population and the susceptibility of assets to suffer loss. It is the result of a region’s exposure to the event (i.e., probability of occurrence at various severity levels) and a society’s vulnerability to the event. While disasters are considered external shocks that destroy development gains, disaster risk is internal to the development process (see Figure 6.2). The concept of disaster risk presents ex-ante or preventive thinking, including a holistic understanding of why disasters occur, their impact on development, and the ways in which they might be prevented.

Figure 6.2: Factors Contributing to Disaster Risk



Source: World Bank 2010.

Hazard, exposure, and vulnerability factors for Nigeria are discussed below.

(i) Hazards—Distribution and Future Trends

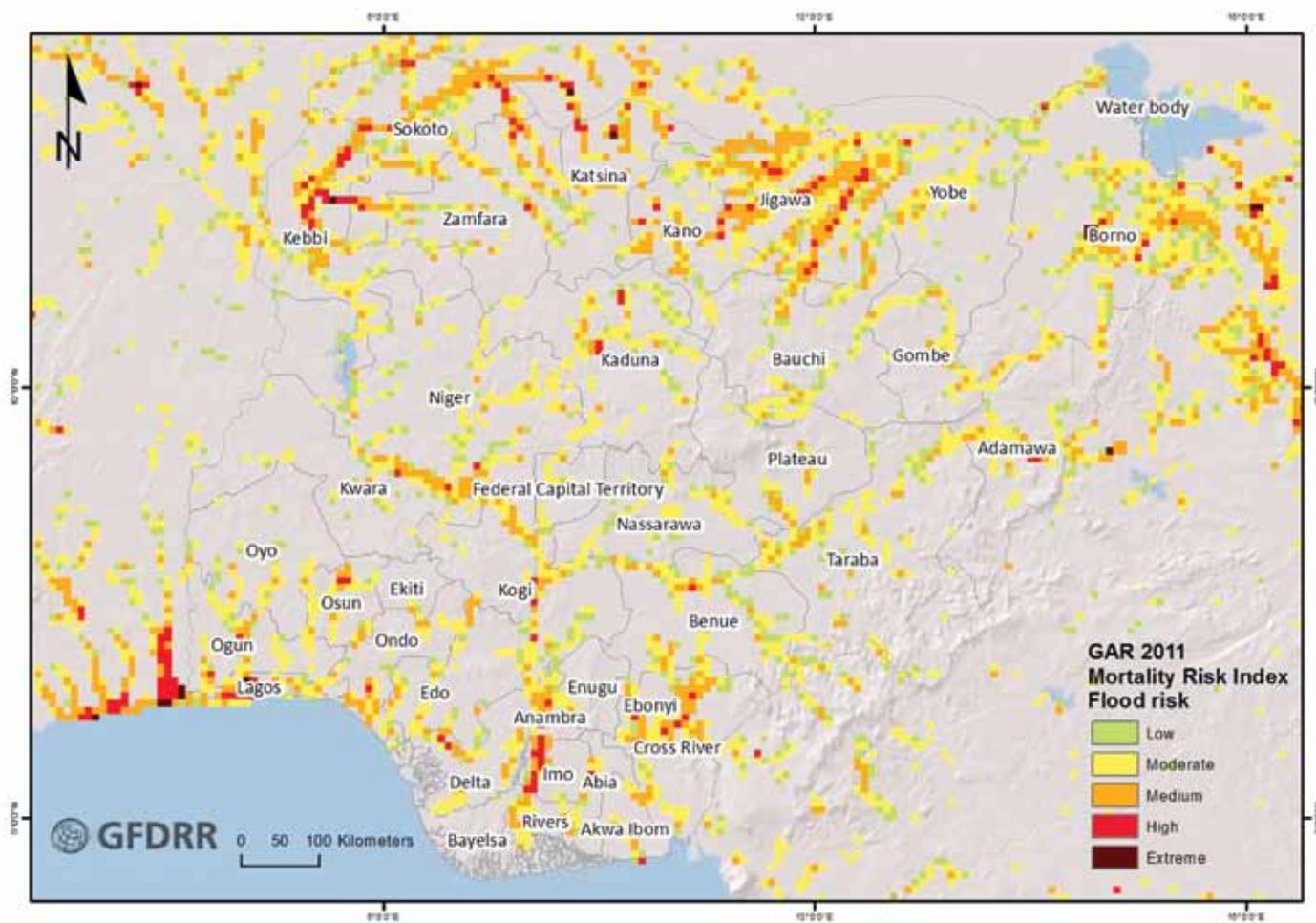
Nigeria’s climate ranges from semi-arid in the extreme northeast to humid in the south, characterized by dis-

tinct wet and dry seasons. The length of rainy season varies between three to ten months from the north-east to the south of the country. Mean annual rainfall throughout the country is estimated at 1,150 mm, with about 1,000 mm in the center of the country, 500 mm in the northeast, and up to 3,500 mm along the coast. Almost the entire country is exposed to one or more natural hazards. Floods usually affect communities along the major drainage basins and their tributaries, but flash floods can impact any region following extreme rainfall. Many of the floodplains around the country's larger rivers, such as Rivers, Niger, Benue, Cross River, Katsina, Imo, and Yobe-Komadugu, are subject to flooding during the rainy season. An es-

timated 25 million people or 28 percent of Nigeria's population live in the coastal zone and are also at risk of flooding. The areas that receive severe flooding impacts include the coastal areas of Lagos, Ondo, Delta, Bayelsa, Rivers, Akwa Ibom, and Cross River states. Droughts are most likely in northern Nigeria. The risk of landslides is high in southern Nigeria. Figure 6.3 crudely⁴⁴ illustrates the main areas at risk in the country with regard to floods (UNISDR and UNEP 2012).

⁴⁴ Although a flood atlas exists for Nigeria, it was not available to the team. The map available on UNISDR's website provides basic information based on satellite imagery and global data sets.

Figure 6.3: Flood Risk Map of Nigeria, Depicting Mortality Risk Index



Source: GFDRR using data from UNEP & UNISDR 2011, Global risk data platform.

Flood risks in Nigeria

Severe flooding events have become a frequent phenomenon facing communities and authorities in Nigeria each year. Although the country is vulnerable to multiple hazards, such as droughts, floods, landslides, gully erosion, and wind storms, it is droughts and floods by far that affect the greatest number of people in the country. In the last two years, Nigeria has been affected by several extreme flood events, which have resulted in devastation and economic damages worth millions of dollars in the affected urban cities such as Lagos, Kano, and Ibadan, as well as in rural settlement communities in Sokoto and Kebbi states. As with all disasters, poor people are the worst hit. In 2010, more than 270,000 people were affected by floods across the country, in Sokoto, Kebbi, Lagos, and in some states in the Niger Delta (Bayelsa state, among others). In 2011, several localized floods and landslides occurred in the country, with tremendous impacts on the affected populations, communities and states.

The 2012 flood disaster was unprecedented in the history of Nigeria. It affected, at the very least, 25 out of 36 states, displaced 3,871,063 people, injured 5,871, killed 363, and destroyed 597,400 homes, according to NEMA. The severity, scale, intensity, and impact of the 2012 flood disaster in Nigeria called for a concerted effort among all the stakeholders, who rallied to cushion its effect on the affected population. The government, through NEMA, sought the support of donors and development partners to provide essential relief materials to the affected persons. NEMA additionally sought the support of the United Nations, World Bank, and the European Union to conduct a Post-Disaster Needs Assessment (PDNA).

Climate change impacts

The development challenge described above is exacerbated by climate change, which amplifies the existing natural variability of the system. Depending on the area, a 1-in-100-year extreme event is now expected approximately every 1 in 10 years, or even more frequently. Temperatures will rise by 1 to 2 degrees by

2050,⁴⁵ accompanied by continually more variable rainfall. Climate change will likely exacerbate existing climate variability and increase the frequency and magnitude of extreme events (IPCC 2007c). According to the Nigerian Meteorological Service, the country is already experiencing climate variability in the form of droughts, floods, shifts in rainy season onset and completion, and increasing rainfall intensity.

Climate variability already affects agriculture, and uncertainty about the future confounds planning among land users. Farmers are aware of more variable weather patterns, such as an unpredictable and compressed growing season, which makes planting decisions more problematic and can reduce yield. The projected rise in temperature by 2050 (an estimated 0.5 degrees in the south and 3.5 degrees in the north) will reduce yields, according to new models. For example, under business-as-usual, the Anambra-Imo basin will likely show yield reductions of 5-10 percent for the south's important cassava, maize, and rice crops by 2020, and double that by 2050.⁴⁶ These models also show that heat stress on northern livestock is rising as gross primary productivity of grazing land is declining; these factors will produce higher livestock mortality in the coming decades.

(ii) Exposure and vulnerability factors

Population growth in hazard-prone areas increases the exposure of people to hazard, as well as potential disaster impacts. Urban areas are at greater risk, due to the concentration of people and assets. Overall, the population is growing at the rate of 2 percent per year in Nigeria, with an urbanization rate of 5.5 percent a year. Major and medium cities are growing at rates between 10-15 percent and 7-10 percent per year, respectively. The rapid growth and increase in urban poverty is leading to informal settlements, which are prone to flooding. Urban poverty in Nigeria has increased from 17 percent in 1980 to 58 percent in

⁴⁵ World Bank, "Nigeria: Enhancing the resilience of development to climate change," Report No. 69027, November 2012.

⁴⁶ Ibid.

1996, and the contribution of the severity of urban poverty to national poverty has increased from 22 percent to 48 percent between 1985 and 1996. At the same time, about 60 percent of GDP is generated in urban areas, indicating the increasing exposure of both populations and assets.

The causes of flooding, erosion, and gully formation differ by location, but are largely human. These include: (a) improper building and infrastructure design, location, and construction, as well as inadequate drainage; (b) poor solid waste management in urban and peri-urban areas that chokes the already inadequate drainage meant to prevent flooding and erosion; and (c) destructive and unsustainable land-use practices that remove protective vegetation cover, including protective biodiversity and carbon-rich areas, or disturb the fragile soil, such as overgrazing, deforestation, cultivation of marginal lands, and uncontrolled mining for building material, which are linked to poverty. Rural areas face similar challenges, with reliance on rain-fed agriculture.

In summary, business as usual is not sustainable. The situation described above has contributed to upsetting the Niger/Benue basin's ecological balance, and therefore the ability of its ecosystems to provide services such as flood regulation, food production, freshwater, firewood and forest products. The environmental stress combines with sector and institutional barriers outlined above to interfere with the country's ambitions, as articulated in Vision 20:2020, to promote durable economic growth while reducing poverty and human vulnerability. Multiple sectors in this risk-prone yet economically important part of the country are affected by business as usual, hindering the country's growth potential. A transformation is needed in the ways in which ecosystems and infrastructure are planned, financed, managed, and monitored, from a current isolated approach to an integrated approach with multiple complementary benefits.

6.3. Disaster risk management in Nigeria

After the establishment of the National Emergency Management Agency (NEMA) in 1999, the country's

flood response capacity and infrastructure have improved considerably. NEMA was established with the objective to "coordinate and facilitate disaster management efforts aimed at reducing the loss of lives and property and protect lives from hazards by leading and supporting disaster management stakeholders in a comprehensive risk-based emergency management program of mitigation, preparedness, response and recovery." The 36 states of the federation were also encouraged to establish State Emergency Management Agencies (SEMAs). Overall, 22⁴⁷ out of 36 states have established SEMAs as the leading agencies for emergency management.

Even though the national response capacity has improved in recent years, risk reduction and mitigation capacity needs to be strengthened. Some of the challenges in reducing and mitigating flood risk are related to inadequate flood control infrastructure, aging or weak dams, inadequate dam monitoring and maintenance, lack of flood risk awareness, along with inadequate solid waste, sewage, drainage, and flood zone management. Urban areas require special consideration, with integrated flood risk management, planning, and enforcement. Many cities or small towns are vulnerable to flood risk, and priority should be given to preparing and implementing structural and non-structural flood control strategies. Current initiatives and gaps under each of the five Hyogo Framework for Action (HFA) components are discussed below.

6.3.1 DRR as a development priority

The government of Nigeria is a signatory to the HFA and reports on progress made towards the implementation of the five HFA priorities. The country recently joined the Consultative Group of the World Bank Global Facility for Disaster Risk Reduction and Recovery Board (GFDRR), which shows the high priority the Nigerian government accords to disaster risk management.

⁴⁷ This number could not be confirmed at the time of finalizing this report.

The enabling legislation for disaster management in Nigeria remains the National Emergency Management Agency Act No. 12 of 1999, as amended by Act 50, which established the National Emergency Management Agency (NEMA). Prior to this law, there was the National Emergency Relief Agency, established in 1990. However, the enabling Act No. 12 of 1999 redesigned and refocused the Agency; from a relief agency, it was transformed into a body that coordinates the management of disaster in all its ramifications. The National Disaster Management Framework (NDMF) provides a mechanism that serves as a regulatory guideline for effective and efficient disaster management in Nigeria, whereas NEMA has a mandate to facilitate prevention and preparedness, and organize response at federal level. NEMA has six zonal offices, which facilitate coordination with the state level and coordinate response in case of disaster. NEMA coordinates its response further with federal-level agencies, the military, and international organizations and development partners. SEMAs have a similar function in the event of emergencies that can be handled at the state level.

Funding disaster management programs is presently a major responsibility of the federal government. The primary source of NEMA's financing comes from annual allocations from the Ecological Fund, set aside to tackle environmental problems and emergencies. According to Section 13 of the NEMA Act of 1999, 20 percent of the federal government's share of Ecological Funds shall be allocated annually to NEMA.

National Development Strategies: Nigeria's long-term national development vision and program is captured in The Nigeria Vision 20:2020, which was adopted in 2010. It outlines a vision to propel the country into the league of the world's top 20 economies by 2020. Attainment of this vision would enable the country to achieve a high standard of living for its citizens. The NV20:2020 was developed by Nigerians for the Nigerian people and involved a process of thorough engagement with all stakeholders across all levels of government and society. NV20:2020 places emphasis on conservation of the environment, preventing loss of bio-diversity, restoring degraded areas, protecting ecologically sensitive sites,

and reducing the impact of climate change on socio-economic development. The measures will also combat desertification and mitigate the impact of droughts, reduce the occurrence and impact of environmental hazards and disasters, and improve overall governance of the environment. High priority will be accorded to the use of natural resources and environmental protection.

Challenges related to institutions and incentives: Institutional capacities for action need to be strengthened for sustainable and effective change. For example, planning and preparedness need to be carried out with good vertical (federal, state, local) and horizontal (across sectors) coordination. Clear responsibilities and mandates must be identified and various actors empowered to participate in multi-sector, multi-scale work, especially on long-term planning, policy, and public expenditure management. Regulatory development and enforcement need strengthening at all levels to transform planning processes into muscular tools that can deliver public goods and protect private benefits. Lastly, governance issues such as contracting irregularities and supervision challenges have been known to interfere with putting durable infrastructure in place. Specific deficiencies include:

- No integrated water resources planning at national, state, or international transboundary levels, and weak integration of climate variability into planning;
- Weak territorial and town/community planning and enforcement of plans, with few incentives in place to transform the status quo;
- Inadequate disaster preparedness and responses, particularly at state and community levels;
- Ineffective community land use bylaws, although there are some isolated good examples such as controlling bush burning or community forest management;
- Need for improved public expenditure planning and execution for long-term, multi-sector, and multi-scale planning and investment;

The points above are becoming the norm, due to weak contracting, supervision, and regulatory development and enforcement.

6.3.2 Risk identification, assessment and monitoring, and early warning

Risk Assessment: Nigeria has never conducted a comprehensive national risk assessment nor engaged in systematic risk assessment activities. Overall, there is no clear guidance from federal and state governments on which methodologies should be used for risk and impact assessments, nor are tools provided to actually conduct these. Generally, the capacity for risk assessments varies from state to state. There is no continuous execution of state-based comprehensive risk assessments and little recognition of the importance of risk mapping. Many state agencies do not seem to conduct structured assessments of hazards, vulnerability, or capacity. Current steps towards risk assessment include: (i) The Vulnerability and Capacity Analysis (VCA) conducted by NEMA in 2009 with the support of UNICEF in 21 Local Government Areas (LGAs) in Nigeria, can be considered a first step towards stronger risk-management structures at the local level; (ii) the Ministry of Environment developed a flood risk atlas, however, it does not include river basin and watershed level information and needs to be updated; and (iii) NASDRA has been developing a flood plain map for 2012 flood-affected areas.

A continuous and participatory M&E system based on the periodic risk assessment profile of disasters in the country would be very important for effective DRM. Such a system would need to develop a robust database, with data inputs from all the relevant agencies. NEMA, in collaboration with relevant MDAs, should also ensure the development of standard datasets for each potential disaster, as well as hazard vulnerability and risk models as ready tools for prevention and preparedness. The systematic inclusion of community members as primary data collectors is desirable.

Although many agencies and institutions have the required technical skills to undertake risk assessment and identification, research institutions have been scattered and have not been systematically linked to inform national disaster risk management agencies. At the federal level, NEMA has established within the Department of Planning a Geographic Information System Unit (GIS), which is already working on floods and landslide haz-

ard maps for isolated areas with techniques that can be used for wider assessments throughout the country. The government has tasked different academic agencies with conducting research and training relevant for risk management, such as in the areas of GIS, space science and technology, remote sensing, flood monitoring, and assessment.

Early Warning: In Nigeria no systematic and automated process for developing and disseminating early warning information has been established to date. Multiple agencies are making piecemeal efforts at trying to set up early warning systems. The Nigerian Meteorological Agency (NIMET) provides weather forecasts and seasonal rainfall predictions. The forecasts are based on soil moisture and historical data, which informs early warning alerts for climate-related disaster threats across the country. Information management of existing risks and data is not distributed proactively as monitoring and early warning information to national disaster risk and emergency management stakeholders. Instead, information has to be requested by the user, which obstructs the flow of critical information which could be lifesaving if distributed in time to the appropriate recipients. For example, the impact of frequent floods in the South-West zone can be reduced thanks to rain forecasts from NIMET. However, state ministries do not receive these warnings directly from NIMET, but need to proactively look for early warning information from the NIMET public website or from the media.

While NEMA has engaged in establishing an early warning system for epidemics, including the institutionalization of the National Influenza Sentinel Surveillance, there is no effective national early warning system in place for floods, either at the federal, state, or local/community levels. The majority of rivers in the country do not have functional water level gauges, while rivers that have stage and discharge stations are not coordinated into an integrated system. The status of hydrometeorology data collection and monitoring for flood warnings is inadequate in the majority of river basins in Nigeria. Hence, overall, the national early warning system on floods is not systematic and there are no clear standard operating procedures in relation to the dissemination of alerts and

how these alerts reach those communities most at risk. Generally, states and local governments have been slow or even reluctant to engage in early warning activities due to limited awareness, an absence of political will, and resource constraints.

In 2008, the Federal Ministry of Environment collaborated with UNDP to organize a National Workshop on Flood Early Warning Systems (FEWS) to create awareness of their importance and to work out modalities for the establishment and implementation of a FEWS.

Central database on past disasters: There is currently no central database on past disasters in place. Historic information on disaster incidents and losses is recorded in decentralized ways but records of previous disasters are not yet systematically stored by a government body. Interviews with NEMA during the PDNA indicate that first steps in that direction have been taken by the agency. The available data has not yet been aggregated, however, and no analysis has been done.

6.3.3 Disaster information, knowledge, and innovation

In Nigeria, there is insufficient evidence-based policymaking and investment prioritization. Improving the evidence base and putting it into action requires working with multiple agencies at multiple levels and on different scales. This is critical to sustaining investment and reducing and preventing risks. For example, data is weak, often fragmented in silos, and not readily shared. Participatory monitoring at local and community levels is rarely practiced, though it could certainly enhance policy and investment performance and help reduce long-term risks from disasters or natural resource overreach. Information access and communications outreach can help unlock greater participation, if strengthened. Specific needs include:

- Development of effective early warning on floods and dam water releases;
- Improvement in collecting, assessing, and sharing data for planning, policy and investment purposes. For example, improvements are needed to develop a

real-time early warning system;

- Better coordination between agencies, both horizontally between agencies and vertically from federal to community levels;
- Ensuring community participation in planning and implementation and monitoring of disaster preparedness activities.

Although much more needs to be done to raise the general public's awareness of disaster risk, some important advocacy work is already under way. The National Orientation Agency and the Ministry of Information are involved in public awareness campaigns on the risks and dangers of hazards, as well as on the basic principles of disaster management. These campaigns are carried out via radio, national television, and print media. They are usually rendered in English and local languages. Furthermore, CSOs such as the Red Cross Society in Nigeria have been playing a key role in raising awareness of disaster risk at the local and community levels.

The 2012 PDNA exercise indicated that there is wide understanding on this topic, but more needs to be done to increase public awareness on disaster risks, especially in relation to floods and building collapses. Although many ministries are already engaging the public to play its part in disaster risk reduction, messages remain too general and do not target specific communities at risk. Community awareness on hazards and risks is low, and public authorities at all levels (with the exception of Lagos state and, to a lesser degree, Adamawa) have not conducted awareness campaigns for local households on the matter.

NEMA includes a Training Department with a mandate to conduct trainings within and outside the agency. One of the aims of NEMA's training activities is to raise DRR awareness among its staff, at the national, state, and local levels and among communities. Since its establishment, NEMA has made some effort to increase its staff capacity in DRR and it has sent some of its officers to attend international DRR courses. Gender is treated as an important aspect of DRR; gender aspects are mainstreamed in DRR training manuals and women's participation in trainings is encouraged.

In light of its limited capacity, NEMA experiences difficulty in implementing its wide mandate, which also includes countrywide DRR training for state, local government, and community authorities. All of these stakeholders need significant DRR capacity building, particularly state and local governments, which seem to focus primarily on disaster response. Local governments have relatively limited administrative and program capacities, and they focus very little of their scant resources on disaster risk reduction. In 2008 and 2009, NEMA trained officers in the six geopolitical zones, with the help of Bournemouth Disaster Management Centre (a U.K. university center), including staff from the local, state, and federal levels on disaster risk management.

NEMA has also supported efforts to take disaster risk management to the community level by conducting community sensitization on flood risks and market fires in many Community Development Councils in the country's six geopolitical zones. The Grassroots Emergency Volunteer Corps (GEVC) program is an effective tool for strengthening local DRR awareness and capacity. It was established in 2008 and so far is represented in 23 states, with a total of 6,408 registered volunteers. NEMA aims to train 200 GEVC volunteers in each local community across the country.

The National Youth Service Corps also participates in DRR mobilization. Moreover, CSOs—the Nigerian Red Cross Society in particular—have undertaken community awareness and DRR capacity development measures. In collaboration with the National Education Research and Development Council, NEMA is in the process of mainstreaming DRR into primary and secondary school curricula. DRR and risk-reduction activities are included in lesson plans, but much remains to be done to integrate these plans at the local level and to train teachers. It is envisaged that information, knowledge, and education on DRR will improve, particularly among youth, when these curricula become operational in schools. Other UN agencies—such as UNDP, FAO, and UNHCR—have also implemented awareness-raising activities.

NEMA has been providing substantive support to six universities in Nigeria since 2009 with the aim of building

disaster risk management capacities. More specifically, NEMA collaborated with universities to train people in Disaster Risk Management (DRM) at the Post-Graduate level. Other Nigerian universities also have DRR-related faculties producing graduates in related areas. A significant achievement of NEMA's Training Department has been the mainstreaming of Disaster Risk Reduction programs into administrative training schools, such as the Police Training College, Armed Forces Command and Staff College, the National Institute for Policy and Strategic Studies, the in-Service Trainings for Civil Servants and National Security and Civil Defense Corps, and the National Youth Service Corps.

6.3.4 Key interventions to reduce underlying risk

Structural context: In Nigeria, major policies to reduce DRR underlying risks—such as National Environment Policy, Food Security, National Policy on Drought and Desertification, National Biodiversity Strategy and Action Plan, National Erosion and Flood Control Policy, Climate Change Adaptation, etc.—are in place, but enforcement and implementation has been weak. A major constraint is that the government has not been able to put in place a comprehensive implementation strategy that would enable these policies to translate into meaningful inter-sectoral activities for environmental management and disaster risk reduction, which could transform the existing policies into anticipatory adaptation and disaster prevention solutions for Nigeria's response to climate change and natural disasters.

Infrastructure and investment deficiencies: In Nigeria, it is critical for flood defense structures to be introduced, rehabilitated, expanded, and complemented by ecological infrastructure.⁴⁸ Countries such as the United States and Netherlands are putting programs in place

⁴⁸ An example from the U.S.: Following the Great Flood of 1993, U.S. researchers estimated that restoration of 13 million acres of wetlands in the upper portion of the Mississippi-Missouri watershed, at a cost of US\$2-3 billion, would have absorbed enough floodwater to have substantially reduced the US\$16 billion in flood damages. Wetlands are also important for livelihoods such as fishing, hunting, and agriculture.

to “make room for the river,” recognizing that erecting civil works to protect existing built assets can have the unintentional effect of building weaknesses into the robustness of the riverine system, and can consequently exacerbate flooding further downstream, as with further damage to the highly exposed city of Onitsha in Anambra state. Specific deficiencies include:

- Flood defense engineering infrastructure is certainly needed but alone is insufficient to reduce all risk; it should complement, not replace, less costly natural defenses.
- Degraded watersheds, forest, wetlands, and floodplains due to improper siting of roads, buildings, settlements, and agricultural production. In the past, such “ecological infrastructure” would have performed important flood buffering services and reduction of erosion, which can alter river characteristics.
- Poor construction and maintenance: under-built and under-maintained buildings and infrastructure contribute to the extent of damage and loss.
- Lack of robust and resilient livelihood options and jobs.

Water management: Poor water resource management is often a source of conflict in Nigeria. On one hand, there is conflict between upstream water management authorities and downstream communities, particularly with regard to floods. On the other hand, there is conflict between pastoralists and farmers. Climate change is contributing to the increasing incidence of drought in the Sahel-Savanna regions, resulting in intense competition for ever-decreasing water points and pasture lands. This problem is aggravated by population growth and the need for more arable lands. Nigeria has more than 200 dams, mainly built for agricultural purposes after the 1972-1973 drought. These dams are often poorly maintained, due to lack of resources, and they face the serious problem of sedimentation. Currently, use of these dams is limited, and in the rainy season their waters are released to avoid dam break. Dam opening then creates floods downstream through drainages that are clogged by the sewage system.

Urbanization, physical and land use planning: Rapid urbanization and continuing population growth in Nigeria have created challenges in the urban environment and have been shifting risk patterns, as infrastructure development lags well behind the pace of urbanization, particularly in the South-West region of the country. Cities lack or have outdated master plans. Population pressure on existing facilities and access to land compelled people to build houses without permission in high-risk areas, such as along river banks.

Although robust laws and policies on physical planning do exist in many cases, the country’s urban centers are faced with problems resulting from ineffective and weak physical planning. Land use management is still widely ineffective and uncoordinated in many states across the country. Reasons for this deficiency are non-adoption of modern planning approaches; outdated land use planning policies, laws, and regulations; inadequate skills and technical capacities; inadequate funding; and inadequate institutional frameworks for land management. At the same time, state ministries of physical planning do not possess enough human resources to effectively operate a physical planning mechanism. Monitoring officers are grossly inadequate, while few of the personnel are knowledgeable in the appropriate techniques of monitoring urban growth.

Such deficiencies in land use planning are one of the underlying factors related to the risk of flood disasters. The lack of appropriate legal frameworks and clear guidelines and the inability to enforce them lead to different interpretations about what should be done to mitigate floods. State ministries of physical planning and urban development do not seem to have established monitoring mechanisms to ascertain whether cities have master plans with hazard/risk maps. Moreover, local governments do not seem to make flood risk maps available to their departments of planning, since they generally appear to work without such hazard maps.

Housing: The lack of adequate measures to enforce laws and policies on construction results in the settlement of poorer segments of the population in flood-

prone areas, as well as in the construction of unsafe structures. Although state governments seek to ensure that new constructions are safe and that legal frameworks are in place against illegal buildings, implementing these regulations has posed a challenge for state governments. Furthermore, the compensation and relocation of the people living in flood-prone areas and unsafe houses remain unresolved. Local governments in Lagos cite urbanization, climate change, and non-compliance with building codes as factors increasing risks in their municipalities.

6.3.5 Preparedness for effective response at all levels

Most SEMAs have warehouses, but prepositioning has been inhibited due to the late release of funds by the government. There is generally little awareness of existing Standard Operating Procedures (SOPs) for emergency response in all states, with the exception of Lagos and the FCT, and harmonization of SOPs is lacking. Contingency planning is unavailable at many levels. For example, during the last flood disaster, NEMA activated the recently signed National Contingency Plan, but compliance posed great concerns. Although the plan spells out stakeholders' roles and responsibilities during a disaster, in line with the National Disaster Management Framework (NDMF), compliance was weak and too slow at national, state, and local levels to mitigate the disaster.

In 2010 and 2011, the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR) provided technical and financial resources to support flood impact assessments, capacity building for disaster preparedness, and specifically conducted a landslide hazard assessment in southeastern Nigeria. In 2011, Nigeria and GFDRR further strengthened their partnership when Nigeria joined as the first African donor country in the global facility. The following main activities have been conducted:

- In 2011, at the government of Nigeria's request, the World Bank/GFDRR conducted capacity-building exercises in disaster preparedness and Post-Disaster

Needs Assessments (PDNAs). So far, more than 100 participants from federal and state governments have been trained in conducting PDNAs.

- GFDRR and the Norwegian Geotechnical Institute (NGI) have signed a Memorandum of Understanding (MoU) to provide just-in-time, highly specialized technical assistance in the field of geo-risks, through which Anambra state benefitted from a landslide impact assessment at selected field sites. Based on the assessment's recommendations, dedicated activity sets were defined within the Nigeria Erosion Water Shed Management Project (NEWMAP) to support institutional strengthening and disaster preparedness at state and regional levels.
- Educational courses on disaster preparedness. In November 2009, a MoU between NEMA and six universities was established to build national capacities for disaster risk reduction by establishing Centers of Disaster Risk Management and Development Studies. This effort is being supported by a US\$660,000 grant from the GFDRR to provide high-level, state-of-the-art tertiary education and research on disaster risk reduction/management to facilitate its mainstreaming in national economic planning.

Other ongoing projects to enhance preparedness in Nigeria include: (i) *Nigeria Erosion and Watershed Management Project* (US\$500 million), which is devoted to supporting institutional strengthening and disaster preparedness at the state and regional levels. In addition to the component on climate change response (US\$30 million), the NEWMAP made provisions for the implementation of a set of activities for strengthening national, state, and local preparedness on disaster risk management; and (ii) following the floods in Ibadan in 2011, a *Flood and Infrastructure Rehabilitation Project* (US\$200 million) is being prepared, which combines investments in the rehabilitation of urban environmental infrastructure with support to urban flood risk management and state and local emergency management agencies to better manage flooding in the city of Ibadan, capital of Oyo state (South-West Nigeria).

6.4. Achieving disaster and climate resilience

Nigeria can strengthen flood risk management and protect human lives, as well as properties and infrastructure, by adopting cost-effective strategies that focus on managing floods and integrating the concept of living with floods, protecting key assets, and minimizing losses. Recommendations to further strengthen Nigeria's flood disaster management capacity are presented below. A number of activities could be financially supported by the Presidential Committee on Flood Relief and Rehabilitation, existing government programs financed by the World Bank and others, and future possible financing from the World Bank lending and UN or bilateral grants. Specific actions are detailed below and summarized in [Table 6.2](#).

Overall, three major areas of investment have been identified: (i) Strengthen DRM and Climate Change Adaptation; (ii) Build Community Resilience; and (iii) Improve Disaster and Climate Change Resilience in Key Sectors.

6.4.1 Strengthen DRM and Climate Change Adaptation

Improve institutions and incentives: Nigeria's institutions at all levels will need to be better networked with one another and put people on the ground to prepare for, respond to, and prevent future impacts from flooding events. Federal planning and data collection agencies will need to be strengthened to provide more efficient and effective and coordinated service delivery, especially on early warning systems. Federal and state emergency management agencies need a full program of capacity support to be able to carry out their mission. State and local governments have attempted to provide limited support for extreme weather events in isolated settings but also face capacity constraints. Communities are often left "shooting in the dark." This effort will thus include establishing a set of principles for flood disaster response and recovery focused on the role of local authorities, communities, and other locally relevant stakeholders. In the process, build the

capacity of these stakeholders to build resilience and more effectively respond to future disasters. Reduce vulnerability to floods and disaster needs to be taken in all appropriate sectoral ministries, especially those involved in infrastructure investments and planning. Local governments also will need to play an increasingly important role in the planning process.

Improve Information: The evidence base for improving preparedness, planning, policy, regulatory enforcement, and infrastructure must be strengthened among numerous actors. Data and information gathering capacities should be further developed among various actors, while remaining connected and openly available to end users. The country will need to ramp up efforts by NIMET, NIHSA, NASRDA and other agencies that collectively observe earth systems to integrate this information into sector activities. Flood and drought early warning systems should be better integrated into development. For example, the old analog hydro-meteorological network density is too low and slow to provide actionable information. Ecosystem monitoring is weak and could benefit from strengthened expert systems and participatory monitoring at the community level.

An open disaster risk information platform and decision support system need to be established that can link PDNA, risk assessment, and early warning information. Such a platform would be capable of providing timely information to all stakeholders, from those producing the information at the federal and state levels, to those using that information. Investment in the following areas is proposed:

1a. Risk assessment and decision support system

- **Assess national flood risk and vulnerability:** The first step in the flood risk management process is developing a comprehensive understanding, analysis, and assessment of flood risks and vulnerabilities that will guide river basin flood disaster risk management strategies, urban development, and land use plans.
- **Develop risk-based national flood management strategies:** Integrated flood risk management

strategies should be implemented at the river basin levels, taking into account the risks and vulnerabilities of the entire system and designing the most cost-effective measures to protect from or respond to flood and other disasters and incorporate locally acceptable and adequate techniques and approaches.

- **Mainstream flood risk management into policy and investments:** Include flood risk management in the national regulatory, policy, and investment system for flood management, including government-financed investment programs, by adopting early risk identification. It is very important that sectoral investments—especially by the government—integrate preventive risk-reduction measures.

1b. Forecasting and early warning

Flood forecasts are just a small piece in the early warning chain. In case of flash floods, such systems play a very crucial role in saving lives. Develop an effective forecasting system linked to weather and river/dam flow data. This will also include strengthening hydrological and meteorological services. Develop early warning and dissemination systems linked to forecasting. Develop emergency response education toolkits that can be easily disseminated and implemented at school and community levels, encouraging planning, simulation drills and community participation in early warning, disaster response, and recovery.

1c. Disaster Preparedness, including flood risk financing and insurance

- **National and State Contingency Plans, disaster awareness, and alerts:** This includes further strengthening national and state emergency plans, ensuring that these are updated and that coordination mechanisms are in place. NEMA's current efforts on national and state disaster risk and alerts should also be strengthened at the national and state levels. Capacity gained through current PDNA exercises should also be assessed to ensure mainstreaming of PDNA in Nigeria, as well as effective dissemination at lower levels.

- **Contingency risk financing facility, risk transfer, and insurance mechanisms:** Due to the increased frequency and intensity of flood disasters in Nigeria, explore opportunities for the gradual implementation of effective risk transfer mechanisms to reduce the impact of disasters and support individuals in expediting recovery from flood events. Contingency risk financing facilities can provide quick resources during disasters. Insurance mechanisms should be designed so as to encourage beneficiaries to avoid occupying high-risk areas, comply with building standards, and further implement flood-proofing and other mitigation measures. A starting point in this direction can be a study to assess the feasibility of risk financing and flood insurance in Nigeria.

6.4.2 Build Community Resilience

Building community resilience is an effective part of overall disaster resilience. This component should be undertaken in places where post-flood reconstruction is taking place, as this provides an opportunity to “build back better” in a manner that reduces flood risk for communities.

Resilient Urban Development: Risk assessment, risk-sensitive land use planning, and investment in resilient buildings, infrastructure, and services are proposed for targeted urban areas. Initially, 10 towns of up to 1 million population can be targeted, including Makurdi (Benue), Yenengoa, (Bayelsa), Asaba (Delta), Lokoja (Kogi), Onitsha (Anambra), Yola (Adamawa), and Birni-Kebbi (Kebbi). Later, such planning and investment can be extended to other cities at risk of recurrent floods.

Resilient Development in Rural Communities: Similar to urban development, community-based disaster-resilient planning and preparedness are proposed in severely flood-affected rural communities. Initially, these sorts of actions are suggested for 250 flood-affected communities. Small community-based grants are proposed to identify disaster risk and proposing risk-reduction measures, such as integrated watershed management, and soil and water conservation. Preparedness will include training communities in rebuilding houses, and

in navigating infrastructure, services, and actions during early warning periods and through actual disasters. The proposed actions can be undertaken through ongoing community development projects, such as Fadama II AF.

6.4.3 Disaster and Climate Change Resilience in Key Sectors

Water resources management and structural flood management measures

A functioning and climate-resilient storm water drainage network and solid waste management system is needed to mitigate floods. Investments in dam safety should be an integral part of water infrastructure planning and should include thorough contingency planning and risk management for possible dam failures. Proposed actions include constructing emergency flood defense structures and multi-purpose reservoirs (small irrigation, hydropower, water supply), along with complementary ecological infrastructure work, such as rehabilitation and protection of floodplains, wetlands, forests, and agricultural lands. Upgrade existing flood defense structures and infrastructure, including roads, drainage, and buildings, and promote permeable surfaces. Provide alternative livelihoods to communities in vulnerable riparian zones. Undertaking river hydraulic studies, river dredging, and dam safety actions are also proposed.

Transportation

There is an undue bias towards new road construction and rehabilitation at the expense of maintenance by all levels of the government. This has led to the severe under-funding of road maintenance, which in turn resulted in a heavy road maintenance backlog. The lack of adequate routine maintenance has led to the silting of drainage and hydraulic structures; as such, when heavy rains are experienced, the roads are easily flooded because the channels for the water runoff have been blocked. Roads that are poorly maintained tend to have potholes, which allow the percolation of water. This leads to weakening of pavement structures and

makes the road more susceptible to washouts when floods are experienced. Edge scouring is also experienced due to the lack of maintenance, both routine and periodic.

The above issues are further compounded by irregular releases of budgetary allocations and the absence of a strategic planning process, coupled with a poor road management information system. The need for a more sustainable funding mechanism for the road sector to enable the relevant actors under the maintenance activities that would reduce the impact of the water and floods on the road is imperative. While most states in the country have developed their own road design standards directly from the federal level, there will nevertheless be need for effective supervision during the construction phase to ensure that standards are met and followed. Road design standards should be upgraded to safety levels, which take into account precipitation levels, flood patterns, groundwater pressure, and climate change effects.

Risk Mapping: A common theme across the country is disjointed regional planning. Settlements develop in an almost uncoordinated and unregulated manner and are based on land availability; due to fragmented planning, development proposals precede infrastructure planning. These lead to people settling in areas prone to the hazards of flooding such as river banks and natural flood plains. There will be a need for greater sharing of information regarding risk mapping between NEMA, the National Space Research and Development Agency (NASDRA), the private sector, and the various federal- and state-level actors to ensure that settlements are discouraged in areas that are most at risk; where this is not possible, higher building standards should be developed and enforced in order to make transport infrastructure more resilient to the effects of disasters.

Risk Management Approaches: The recommended risk management approaches for moderate flooding are: (i) Raising embankments to avoid frequent overrunning; (ii) Providing adequate drainage structures; (iii) Upgrading selected roads to asphaltic concrete paved road standards, and surfacing of other roads with non-slippery

surface-dressed chippings of single or double coat, based on traffic analysis; (iv) Regular preventive maintenance (desilting of culverts/drainages, etc.). Prior to raising roads affected by previous flooding, it is important to conduct hydraulic studies to determine the optimal number and size of the drainage, otherwise the road could raise water levels artificially upstream or act as levees when they run parallel to the river.

It is especially important to ensure safe road access to schools, clinics, markets and critical public infrastructure and improve access to villages and homesteads vulnerable to flooding.

Urban stormwater management requires more comprehensive planning. Rain water and over-spilling water from the outskirts of townships can be carried away by a stormwater system constructed as part of the urban roads.

Roles of the federal government: Most of the critical transport infrastructure is owned by the federal government (primary roads, which are the major trunk roads (trunk A)), while state governments have responsibility for the other roads. Other transport assets such as railways, airports, and ports are all owned by the government as well.

Hence there is a need for the government to take on a greater leadership and coordination role to ensure that all stakeholder efforts are in synergy with one another. In this regard, the federal government could play a facilitating role in the following:

- Vulnerability studies can be undertaken to map areas that are at risk and to grade these risks, taking into account climate change and its predicted impact into the future. Based on the studies above, new design standards can be developed that should make the infrastructure more resilient to future flooding.
- Awareness should be raised at all levels about critical infrastructure issues regarding flooding as informed by studies and risk mapping, and more localized sectoral action plans should be championed and supported.

- From the experience of this flood, the response of the relevant actors was usually slow, disjointed, and of varying quality. There is a need for a coordinated, targeted national measure, including research, training, and education, and promoting good practice. The objective of this initiative would be the institutionalization of responses, so that, in the event of emergency, all actors know what is expected of them, as well as when and how they should coordinate their own efforts.

Redundancy for vulnerability reduction: The Abuja–Lokoja Road, a key trunk road, was overtopped with flood waters and motorists were stranded on it for about five days. Although there were alternative routes (Makurdi–Lafia–Akwanga–Abuja on the eastern flank, and Ilorin–Jebba–Mokwa Road on the western flank), the Ilorin–Jebba–Mokwa Road is in very bad shape and is almost un-motorable due to lack of maintenance. It is highly likely that this scenario occurred in other areas that experienced floods as well.

It is, of course, not feasible to build alternative routes for all roads in the country. However, from a risk-mapping standpoint, areas and roads that are more susceptible to floods can be identified, and provided that costs and location considerations are not problematic, then an alternative/redundant road can be built.

Electricity

Every disaster marks the nation, but it should additionally serve to alert the population to the probable recurrence of such a devastating event and the possibility that it might next occur on an even larger scale.

It is gratifying that most electricity installations are long-term investments, especially transmission lines and, to some extent, distribution lines. This partly accounts for the fact that supply was immediately restored when the floods receded. It will be difficult to estimate any costs, because the entire subsector is undergoing repositioning. Any costs therefore should be factored into the new arrangement. Disaster risk reduction in the subsector should consider the following:

- Replace wooden distribution poles with concrete ones.
- Elevate transformers above possible flood levels in cases where they cannot simply be relocated.
- Ensure safety standards and global best practices.
- Mitigate losses in electricity supply. In electricity supply to final consumers, losses refer to the amounts of electricity injected into the transmission and distribution grids that are not paid for by users. Total losses have two components: technical and non-technical. Technical losses occur naturally and consist mainly of power dissipation in electricity system components, such as transmission and distribution lines, transformers, and measurement systems. Non-technical losses are caused by actions external to the power system and consist primarily of electricity theft, non-payment by customers, and errors in accounting and record-keeping. These three categories of losses are respectively sometimes referred to as commercial, non-payment, and administrative losses.
- Meter and bill for electricity actually consumed by users, as this is integral to the commercial management of an electricity utility. Another critical task is the collection of the billed amounts.
- Ensure the effective performance in both functions, which is critical to the financial viability of the company. From an operational point of view, metering-billing and collection are separate functions and they require distinct management approaches.

Health

- Develop comprehensive national policies on increasing the safety and emergency preparedness of health facilities (HFs) and staff.
 - Draft comprehensive guidelines on how to implement a safe hospital program, including mechanisms on how to control and supervise health infrastructural projects, land-use planning, architectural design, and building codes standards for the development and maintenance of HFs.
 - Develop and coordinate multisectoral programs related to the safety of health facilities and emergency preparedness.
- Ensure that the development of proposals and plans for all new HFs include hazard and vulnerability assessments.
 - Assess existing HFs to identify the priorities for retrofitting and other actions, e.g. using the Hospital Safety Index.
 - Develop training courses in safety and emergency preparedness in undergraduate, graduate, and continuing professional courses for construction, health and other sectors.
 - Initiate programs to reduce underlying risk factors.

Education

Short Term

- At the national level, establish an Education in Emergencies Working Group to coordinate the education response and preparedness/disaster risk reduction in education. When the working group is up and running at the national level, roll out a similar system at the state level.
- Building on the existing Education Management Information System, establish a user-friendly information management system that will allow collection, analysis, and sharing of information essential for partners to make coordinated, informed, evidence-based, and strategic decisions on: a) the education needs of affected populations; b) the prioritization of these needs; c) the key gaps in activities to meet prioritized needs; and d) what capacity (human, material, financial) is required in support of the identified prioritized response needs.
- Preposition appropriate teaching and learning materials in areas with recurrent emergencies, including floods.
- Organize hygiene education trainings for school communities, including cholera prevention and distribution of key health messages.

Medium Term

- Train ministry of education focal points at the federal and state level on education in emergencies:

- Conducting assessments
- Coordinating preparedness
- Coordinating a response
- Revise the education portion of the national contingency plan in line with the Education in Emergencies Working Group's strategy.
- Develop guidelines on the use of schools as shelters, aimed at: a) avoiding the use of schools as shelters, and b) reducing the impact on education when schools are used as shelters.
- Use the experiences with the provision of psychosocial support training to develop a standard training module for use in future emergencies.

Long Term

- Build Back Better in flood-prone areas:
 - Assess the site before reconstructing a school and consider relocation when needed.
 - Elevate the building (on stilts or earth fill).
 - Create (earthen or concrete) flood barriers.
 - Improve buildings to prevent their destruction in the next floods (e.g., do not construct schools or teachers' quarters in mud).
 - Build good drainage systems (also to drain floodwaters if they breach the barriers).
 - Install all electrical, mechanical and plumbing systems above the expected flood level.
 - Ensure that school toilet facilities are located above expected flood elevation and downstream and down slope of school facilities.
 - Divert high tension power lines in the school area.
 - Advocate for the enforcement of building codes.
 - Revise the ministry's building code to ensure that construction is hazard-resilient.
- Assess the extent to which DRR is included in (pre-service and in-service) teacher training and advocate for the necessary reforms.
- Assess the extent to which DRR is included in the school curriculum in primary and secondary schools and advocate for the necessary reforms.

- Assess the need to teach children in flood-prone areas to swim and take the appropriate initiatives.
- Work with School-Based Management Committees and Parent-Teacher Associations to limit the impact of disasters on education in their communities by:
 - Develop maintenance plans for the schools, engaging the community, pupils and local authorities.
 - Prepare school-based preparedness and response plans (including the identification of safe areas, evacuation plans and drills, safe storage of teaching and learning materials in case of an emergency, school response kits, etc.)

Gender

Train and retrain women, empower and involve them in the entire process.

Environmental Management

- Conserve and restore vegetation and forests in mountainous areas, woodlands, etc..
- Maintain and expand the forest population in the river basin by semi-natural reforestation, particularly in mountain and hilly ranges.
- Conserve and restore degraded wetlands and floodplains, including reconnecting rivers with their floodplains. The maintenance of the vegetation edging a waterway is, however, necessary in a way that is both respectful of the wealth and biodiversity of these environments and effective against the risk of flood damage.
- Improve land reclamation, including reducing the drainage of the landscape, reversing the straightening of watercourses and bank reinforcement, while ceasing the drainage of swamps, as it will be contrary to the objective of flood prevention.
- Reclaim former floodplains and lakes by creating buffer zones, relocating dykes, and opening natural levees by creating inlets at the deepest terrain sections, in order to reincorporate these areas as natural retention areas into the discharge dynamic.
- Ensure land uses are appropriate to areas prone to

flooding and erosion, enhance soil conservation by avoiding excessive soil compaction and erosion.

- Develop manageable flood polders, which should preferably be used as extensive grassland or to restore alluvial forests, at selected locations of former floodplains to lower flood peaks.
- Increase the flood conveyance capacity of the flood bed in the middle and lower river sections where the natural slope of the river is too little by

making every possible effort to dismantle manmade obstacles of flow, by encouraging appropriate land uses, e.g. rehabilitation of pastures and mosaic-type floodplain forests in the floodway, by creating bypassing channels in the flood bed (where possible and if necessary), and by increasing the flow capacity of bridge sections.

- Limit soil sealing as part of urbanization. Unsealing measures promote rainwater infiltration.

Table 6.2: Proposed DRM Actions and Indicative Costs

Time Period	Proposed Actions	Indicative Cost (million Naira)	Government Agency
Strengthen DRM and climate change adaptation			
I(i)	Improve institutions and incentives		
Short to medium	Establish an Integrated Flood Risk Management	–	Federal, state, and local governments
I(ii)	Improve Information		
1a	Risk Assessment and decision support system		
Short	Establish a flood risk assessment modeling platform	32	NEMA
Medium	Undertake National Hazard Risk Mapping	320	FMENV, NASDRA, FMWR, FMT
Medium	Establish an open Disaster Risk Information (DRI) and decision support system to improve inter-agency coordination/information	320	NEMA
1b	Forecasting and early warning	0	
Short	Establish an early warning system linked to a decision support system	1,600	NIMET, NIHSA, FME
Medium	Strengthen hydrological services	3,200	NIHSA
Medium	Strengthen meteorological services	3,200	NIMET
1c	Disaster preparedness	0	
Short	Develop national and state contingency plans	320	NEMA, SEMA
Short	National database on past disasters, critical infrastructure, and supplies	32	NEMA
Medium	Establish a database on past disasters in all states	576	SEMA
Medium	National and state disaster risk awareness and disaster alerts	32	NEMA, NOI, FMH, FMENV
Short	Mainstreaming Report into MDA Budgets	16	NEMA
Short	Conduct a DRFI study	48	FMF, NEMA
Long	Implement findings of the studies	-	
SUB-TOTAL		9,696	
Build community resilience and invest in infrastructure			
2a	Resilient urban development		
Short	Preparation in selected cities - Targeted urban risk assessments, risk-sensitive land use planning, building design and compliance, resilient infrastructure and services	800	State, LGA, SEMA, SEMC, NEMA
Medium	Implementation (first phase, waste management, roads, drainage, flood management structures, housing subsidy for the poor, relocation		State, LGA,
Long	Preparation and implementation of Integrated Flood Management in all small and large cities of the country prone to flooding	16,000	State, LGA,
2b	Resilient development in rural communities		
Short	Preparation of targeted/pilot LGA and community DRM plans, Phase I, including integrated watershed management, soil training, community disaster preparedness, risk reduction	400	Works dept of LGA, state FMWARD, SEMA, NEMA
Medium	Implementation of LGA and community DRM plans Phase I emergency infrastructure and disaster preparedness, including setting up of a risk financing facility	4,000	Works dept of LGA, state FMWARD
Long	Preparation and implementation of Integrated Flood Management in all small and large communities of the country prone to flooding		
SUB-TOTAL		21,200	

Time Period	Proposed Actions	Indicative Cost (million Naira)	Government Agency
Disaster and climate change resilience in key sectors			
3a	<i>Water resources management and structural flood management measures</i>		
Short	Assess dam safety and flood management structures	64	FMENV and FMWR
Medium	Dredging, dam safety actions	8,000	FMENV and FMWR
Short	Undertake river hydraulic study	96	FMENV and FMWR
Medium	Undertake river dredging	8,000	FMENV and FMWR
3b	<i>Transportation</i>		
	Determine the optimal number and size of the drainage before designing/reconstructing roads	32	FMTW
Medium	Implement flood prevention measures		FMTW
Medium	Maintain critical roads and bridges that link emergency buildings and services		FMTW
Medium	Guidelines, policy, and training for risk-sensitive land use planning, including transportation and design codes based on risk assessments	80	FMTW
Medium	Crisis management program, procedures and training on a sectoral basis	80	FMTW
Long	Consider building alternate roads in flood-prone areas		FMTW
3c	<i>Electricity</i>		
Medium	Replacing wooden distribution poles with concrete		
Medium	Elevation of transformers		
Medium	Ensure safety standards and global best practices	64	
3d	<i>Housing</i>		
Short	Review current national policy on housing (2012) to include flood-resilient housing guidelines	32	FMLHUD ⁴⁹
Short	National building codes review to include flood-resilient housing codes	32	FMLHUD
Short	Capacity development on resilient prototype housing design, building materials, and construction quality	1,920	FMW, UPBPA
Medium	Long-term advocacy and training programs on safe building linked with incentives	5,920	State, FMW, UPBPA, DCA
3e	<i>Health</i>		
Short	Develop a safe hospitals program	64	FMH
Short	Assess existing HF's	32	FMH
Medium	Training courses in safety & emergency preparedness		FMH
Medium to long	Presence of local capacity in safety and emergency preparedness		FMH
3f	<i>Education</i>		
Short	Establish an Education in Emergencies Working Group to coordinate the education response	32	FMENV
Short	Develop a safe school program	96	FMENV
Medium	Implement safe schools, including retrofitting Development of teachers guide, capacity building	8,000	FMENV, NEMA

⁴⁹ Federal Ministry of Lands, Housing, and Urban Development.

Time Period	Proposed Actions	Indicative Cost (million Naira)	Government Agency
Disaster and climate change resilience in key sectors (cont.)			
3g	Gender		
Short	Train women in recovery and reconstruction		
Medium to long	Involve women in disaster preparedness, risk reduction planning		
	Collect disaster data/ risk assessment by gender		
3h	Environmental management		
Short	Removal of water hyacinth	1,920	FMENV
Medium	Sensitization of stakeholders	1,520	FMENV
Medium	Restore floodplains, initiate integrated watershed management	3,200	FMENV
SUB-TOTAL		39,184	
TOTAL		70,160	

Source: Estimations by the Assessment Team using official information.



Ismail Abdulhi is a pastoralist in Ta Kuti village (Niger State) and beneficiary of Nigeria's Fadama II project.
Photo: Arne Hoel / World Bank

CHAPTER 7: TRANSITIONAL RECOVERY, AND RECONSTRUCTION FRAMEWORK

7.1 Introduction

The calamities wrought by the 2012 floods offer an important window of opportunity to address difficult, long-standing development issues. The challenge now is to make full use of this opportunity. If Nigeria rises to the challenge, it will facilitate modernization of the country overall and the Niger and Benue river basins in particular, with improved living conditions for its population. If it does not rise to the challenge, the country will be increasingly at risk from the impacts of recurrent floods, as well as the negative impacts of possible future climate change.

Instead of letting Nigeria's vulnerability to floods increase, federal and state authorities and the private sector should together shore up Nigeria's flood resilience. With more extreme weather and devastating floods likely in store in the decades ahead, public safety and economic security depend on strengthening vulnerable poor residents' natural resource-based livelihoods and jobs.

A robust recovery and reconstruction framework provides a sequenced, prioritized, programmatic, yet flexible (living) action plan to guide the recovery and reconstruction process that addresses the following questions:

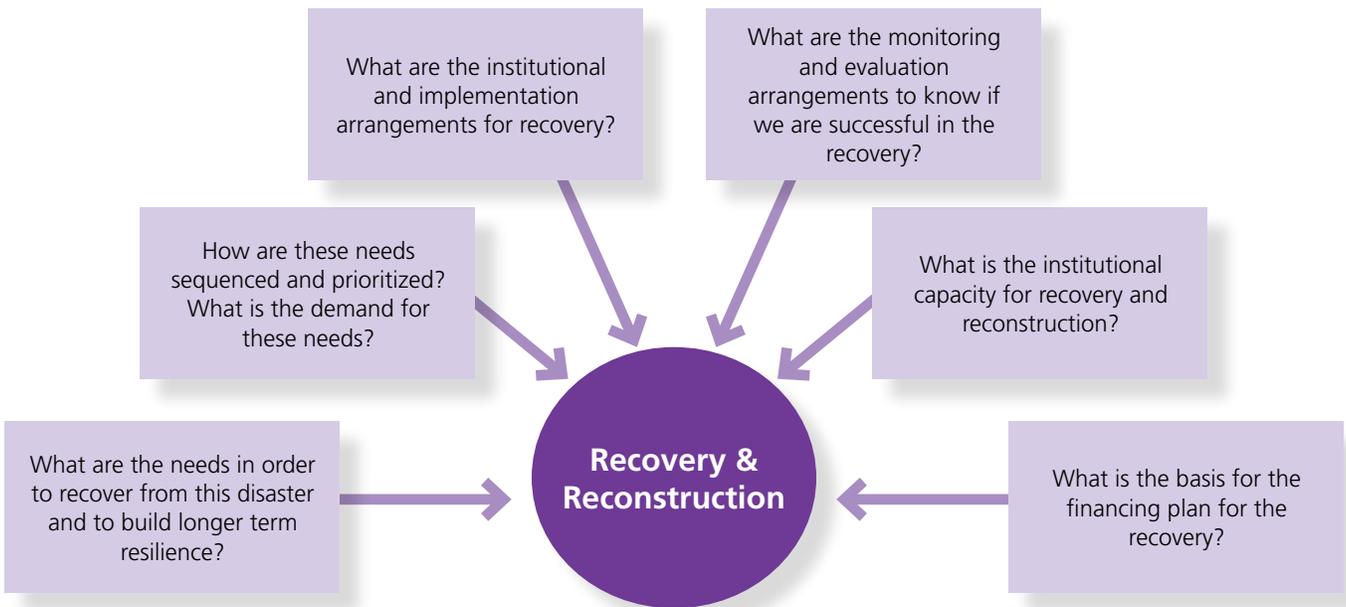
- Why is a recovery and reconstruction framework needed?
- What are the goals of recovery and reconstruction? How to prioritize the identified needs? What is the timeline for implementing identified actions?
- What implementation arrangements can ensure coordinated and efficient actions?
- What are the monitoring and evaluation arrangements to track progress?

- Why and how to ensure social equity, community participation, and public awareness throughout recovery and reconstruction?

When fully fleshed out and operationalized, such a framework could help governments, donors and other stakeholders to:

- Maintain a cohesive and flexible structure for managing the overall recovery and reconstruction process, including communication flows and information feedback loops;
- Clarify roles, responsibilities, and institutional arrangements to capitalize on the strengths of each stakeholder, and augment capacity where needed;
- Effectively prioritize, sequence, and drive multi-sectoral and cross-cutting recovery decisions, activities, and allocation of resources;
- Systematically integrate disaster risk reduction in reconstruction and recovery and formalize policy and strategic linkages across recovery and regular development processes;
- Implement recommendations and strategies outlined in the PDNA;
- Assist in establishing robust and criteria-based monitoring and evaluation systems for recovery;
- Apply lessons learned from other countries and adapt them to national contexts.

This chapter starts by describing guiding principles for recovery and reconstruction, including a discussion on the "build-back-better" approach. Sectoral needs, current interventions, and institutional capacities are presented in the next section. A potential action plan consisting of priorities, timeline, monitoring and evaluation arrangements, financing options, and technical support is presented in Section 7.4. Com-

Figure 7.1: Questions That a Recovery and Reconstruction Framework Can Help Answer

munity involvement is not only important for future resilience but also for ensuring effective implementation and change at the ground level. Section 7.5 presents elements of a comprehensive communication and grievance redressal plan to ensure public awareness, inclusiveness, and equity. Finally, next steps are discussed to finalize the framework and start the recovery and reconstruction process. It must be noted that this chapter is designed to be a living document to serve as reference for the recovery framework consultations. It must first be reviewed and finalized during the recovery framework workshop and must then be periodically updated during the recovery as progress is made and more information becomes available.

7.2 Guiding Principles for Recovery, Reconstruction and Resilience in Nigeria

A successful recovery program must ensure that all stakeholders work towards a common vision for recovery and longer-term resilience. Guiding principles help to align recovery objectives and the actions needed to reach them. They also help to establish an over-arching system for recovery planning across sectors and inform

the prioritization and sequencing of recovery needs. Guiding principles thus serve as a collective vision of the post-recovery future and determine criteria for the recovery process. They are an opportunity to adopt best practices from past experiences. Along with the policies and standards for action they set the tone and pace for the entire recovery process, and allow for the devolution of decision-making.

The formulation of guiding principles is an important part of the recovery planning exercise, and the principles identified should form the basis for recovery planning. Please note that a detailed planning exercise was not conducted in the formulation of guiding principles for this PDNA. The principles below are thus adapted from other international experiences in order to provide a starting point for the discussion on guiding principles. Please note that care must be taken to ensure that these principles are finalized in a consultative manner, are owned by the government and other recovery actors, are pragmatic, and that they help (rather than hinder) decision making. Arriving at the goal of resilient recovery and resilient development involves asking the fundamental questions: what does good recovery from this disaster mean? And what does longer-term resilience mean for Nigeria?

Safe Havens in Bangladesh for Protection against Cyclones

The Paschim Napitkhali Primary School, a nondescript, two-storied building, played a life-saving role in 2007, when Barguna and other coastal regions were hit hard by the storm surge of over five meters (16 feet). During the year, the primary school bustles with children, but during cyclones and other natural disasters, the building doubles as a shelter. In 2007, this cyclone shelter alone helped save more than 800 lives.

Emergency cyclone recovery and restoration projects after the 2007 Cyclone Sidr in Bangladesh are supporting the construction, reconstruction, and improvement of existing shelters in the 13 districts that were classified as severely and moderately damaged by Cyclone Sidr.

While some of the answers may be articulated in DRM strategies and other policy documents, the goal for the government and other stakeholders would be to jointly adopt a vision for recovery, after which a consultative process must be followed to arrive at guiding principles. These would then inform the recovery team's decision making towards achieving the shared goal.

Building Back Better and longer-term resilience:

One of the primary goals of the recovery and reconstruction process is to build long-term resilience. While this may not necessarily entail radical redesign and restructuring, there is a need to ensure that realistic building-back-better measures are considered in the design of infrastructure to be rebuilt. Community involvement, behavioral changes and other "soft" interventions are often equally important in building longer-term resilience. Further, it is not enough to just have the "commitment to build back better" as a stated outcome but it must also be ensured that there is a credible mechanism to measure, monitor, and evaluate the recovery and disaster risk-reduction measures. The box below demonstrates an example (from Bangladesh) of how longer-term resilience-building interventions could be incorporated into recovery and reconstruction programs and how they could reap dividends.

Guiding principles used generally can be broadly grouped under four categories. It should be noted that these principles are currently very generic; a thoroughly consultative process will be needed to identify and adapt the principles that are most relevant to Nigeria.

- Strategy
- Implementation
- Governance, Monitoring & Evaluation
- Coordination

Strategy

- **Focus on the most vulnerable and socially disadvantaged groups**, such as children, women, and the disabled. Disasters increase the vulnerability of all, but especially of those who are already disadvantaged. Recovery programming should give priority to the most vulnerable groups, including female-headed households, children and orphans, and the poor, and take into account those with special needs, to avoid their being overlooked.
- **Augment ongoing emergency assistance operations by building on humanitarian programs.** As the focus moves to recovery operations, some relief efforts will still have to be maintained. The PDNA did not explicitly assess continued humanitarian needs but proposed early recovery interventions will have positive impacts on ongoing needs, help address gaps in the delivery of relief assistance and revitalize the capacity of communities to recover from disasters. However, emergency operations targeting residual relief needs should be scaled down in tandem with the scale of implementing the recovery activities, be targeted at the most vulnerable, and be designed to hasten the socio-economic recovery of affected communities.

Align recovery interventions with key national DRM policies.

- **Move from a culture of response to one of long-term resilience** to address long-term vulnerability and risks. To help prepare effectively to reduce future disaster risks, recovery interventions should be designed to promote resilience to future shocks by including utilizing this window of opportunity to bring attention to the importance of DRR and the need to integrate risk reduction at both policy and sector levels in national, state, and local development. As such, recommended recovery measures should also help catalyze dialogue between government, communities, and development partners to link ex-ante disaster prevention and climate change.
- **Leverage flood recovery to prepare for future and multiple hazard events.** Effective recovery should reduce exposure to and impacts of future hazards, whether they occur as independent events due to climate change or as cascading effects of the current flood hazard. At the time of the PDNA, several communities were still underwater, while the flood waters had subsided in some. Communities expressed concern about further flooding in the 2013 rainy season, given the high level of residual soil moisture due to the 2012 flood and likely high rainfall in 2013. In view of the likelihood of these related future hazards, recovery interventions need to involve measures to reduce underlying vulnerabilities and exposure to multiple hazards. This requires that recommended recovery measures stimulate change and policy development to “build back better” and thus reduce future risks from major hazards (including drought).
- **Include the community and use local knowledge and skills.** This ensures the optimal use of local initiatives, resources, and capacities. Planning and execution is based on local knowledge, skills, materials and methods, and enterprises, taking into account the need for affordable solutions. This principle further promotes community participation in all aspects of the recovery process and partnering with local institutions. This will allow post-flood assistance to support and build on spontaneous recovery

initiatives by affected communities. It encourages decision-making concerning planning, design, and implementation at the lowest level possible, to promote community ownership and empowerment, and to ensure solutions are locally appropriate.

- **Secure development gains while differentiating between regular development and disaster recovery.** Recovery planning must attempt to re-establish and secure previous development gains, and areas not affected by the disaster should not lose out due to increased allocation of public resources to the disaster-affected areas. It must, however, be noted that while disaster recovery provides opportunities for improving the disaster-resilience of affected infrastructure and assets, it should not include improvements or enhancements that fall under the purview of regular development.
- **Adopt a phased approach to recovery involving immediate and longer-term interventions.** The early recovery component of the assistance program should be based on a strategy of meeting immediate needs while providing the first opportunity for the affected population to rebuild the homes, lives, and living environment devastated by the flood. Meeting these priority early recovery needs requires a three-pronged approach, involving: (a) providing quick response to those in need immediately after the humanitarian phase; (b) supporting the repair of vital community infrastructure while providing temporary employment opportunities to restore lost income (this would be scaled down progressively as normal recovery ensues); and (c) facilitating local economic recovery and development to resume economic growth by helping to restore the normal productive livelihoods of affected communities. Longer-term effective recovery requires a comprehensive strategic approach that ensures hazard-resistant reconstruction, sustainable economic recovery, and reduced exposure and vulnerability to disaster risks, thereby ensuring resilience, through: (a) reconstruction and improvement of social and economic infrastructure; (b) livelihood recovery, economic regeneration, and social protection; (c) ecosystem protection and enhancement; and (d) disaster preparedness, response, and risk-reduction capacity development.

- **Prioritize and sequence needs in the overall Recovery Framework.** The prioritizing and sequencing of needs across sectors must be done after internal prioritizing is complete within each sector. This must then be done at a cross-sector level through a consultative process which includes representatives from all sectors, ensuring that the needs of every sector are given due priority. Furthermore, a distinction must be made between what is urgent (must be done immediately) versus what is important (must be done regardless of time).
- **Build on lessons of past experiences in disaster risk management.** Planning and prioritization for recovery should be based on sound lessons of experience and practices while leveraging best practices in the region and worldwide.
- **Strengthen capacities to manage the recovery process.** The capacity of local public administration, including infrastructure, must be strengthened. Along with local and national institutions, encourage and empower all levels of civil society to participate in and manage the recovery process. In this regard, the role of local governments needs to be given priority. It would also be important to mobilize private investment—both human and financial—by ensuring that the local private sector has incentives and technology to participate fully in reconstruction.
- **Further strengthen institutions and their ability to manage risks.** Recovery efforts should strive to strengthen existing institutional structures and build long-term capacity to manage disasters, particularly floods, drought, and food crises.

Implementation

- **Prioritize service delivery support to local governments directly in the short term and implement a program of capacity building over the long term.** Even prior to disasters, affected areas typically have limited capacity to implement development programs. Disasters usually only exacerbate this, and there is a need to assess and prioritize capacity development.
- **Maintain realistic recovery programming while exploring innovative and ambitious approach-**

es for implementation. Planning strategically and conservatively to ensure that there is sufficient capacity to undertake recovery tasks while developing innovative efficiency mechanisms.

- **Institutionalize urgency.** Assessing current institutional arrangements, including processes and procedures for recovery interventions, and if necessary, review and streamline them or develop special dispensation for key recovery processes.

Governance, Monitoring & Evaluation

- **Develop a strong monitoring and evaluation (M&E) system** to ensure that the course of recovery, reconstruction, and DRR activities get completed in a timely way. An M&E mechanism must be used as a tool that brings together all the recovery, reconstruction, and disaster risk-reduction initiatives that have been envisaged towards delivering results as a coherent whole. The users and target audience of the performance management tools should be the managers of these programs and the projects that make up the recovery programs going forward.
- **Employ a dedicated body within the government** to own and implement the results agenda for recovery, reconstruction, and disaster risk reduction with adequate resources for its successful functioning.
- **Leverage existing capacities.** The capacity of existing M&E systems must be first assessed and any existing capacities and resources must be leveraged. Further, the capacities and resources of development partners' M&E must be assessed in order to ensure a harmonized M&E framework for recovery and to leverage synergies.
- **Maximize credibility through independent oversight mechanisms,** third-party monitoring, and community-based grievance redress mechanisms.

Coordination

- **Need for a coordinated effort.** In order to create a lasting impact for affected communities, it is imperative that all actors work in concert to put in

place and successfully execute interventions that are geared toward building long-term resilience. It will be important to ensure harmonization between all stakeholders involved in needs planning and execution. As seen in the next section, there are several institutional stakeholders in recovery and reconstruction, thus there is a critical need to bridge relief, recovery, reconstruction, and disaster risk reduction efforts.

7.3 Institutional Capacity Analysis

Flood recovery and reconstruction

A number of government agencies are likely to be involved in flood recovery and reconstruction at the federal level. These activities are currently conducted with limited intersectoral coordination among the institutions involved. In addition, these institutions are under-funded and have limited technical capacity to address gully erosion in an integrated approach. Capacity analysis of some of the key government agencies is discussed below.

Flood response and recovery: National Emergency Management Agency (NEMA)

Responding to communities affected by disasters such as floods, droughts, erosion, wind/rain storms, and hazards from such disasters as fires, epidemics, and the destruction of infrastructure is the responsibility of the Nigeria Emergency Management Agency (NEMA). NEMA's mandate includes educating the public in order to raise levels of awareness and preparedness, as well as detecting disasters and responding to them in a timely manner. It is an independent agency under the Presidency. The Governing Council, which oversees activities of the Agency, is comprised of representatives from various MDAs.⁵⁰ NEMA's departments include training; search and rescue; relief and rehabilitation; planning, research and forecasting for disaster management;

and two non-technical departments, which are finance and administration. NEMA has six zonal offices, which in the last year have been strengthened by the recruitment of around 192 new staff.

The Mission Control Center

Nigeria's Mission Control Center (MCC) is located in NEMA and is an aid to search and rescue operations, which are able to receive and process distress alerts from aircrafts, vessels, and land users. This is able to provide location information on distress victims to search and rescue teams and as such would be an important tool that can be used in erosion disasters for timely evacuation. The center has been decommissioned and relocated since NEMA's headquarters began renovations in 2009, however, the Spanish MCC is currently providing backup. In 2009, the MCC received 103 distress alert signals and only three were real while others were false alerts due to poor handling of the beacons. This tool would be useful in informing communities of erosion disasters.

State Emergency Management Agencies

NEMA depends heavily on the coordination and collaboration of state and local governments to effectively implement its mandate, which has affected its effectiveness to respond to disasters in a timely manner. The Act establishing NEMA⁵¹ calls for state governments to establish their autonomous State Emergency Management Agencies (SEMAs) to take charge of disaster management in the states while NEMA operates at the federal level and is only called upon to participate in disaster management operations that are beyond SEMAs' capacity. Many SEMAs lack training from state government to prepare them for the task of managing disasters in their individual states.⁵² This has led to NEMA functioning mostly in isolation.

NEMA Zonal Officers

In addition to the challenges faced by SEMAs, most zonal offices experience difficulties in responding effi-

⁵⁰ Members of the Governing Council include the Federal Ministries of Aviation, Foreign Affairs, Health, Internal Affairs, Transport, Environment, Water Resources, Works and Housing, Nigeria Police Force, Nigeria Red Cross Society and is chaired by the Vice President of Nigeria.

⁵¹ Act 12 as amended by Act 150 of 1999.

⁵² NEMA, Annual report 2009, July 2010.

ciently to disasters. These include equipment with limited functionality and a lack of funding due to delays in allocating funds from Headquarters. For example, some zonal offices lack the drivers and vehicles necessary for conducting operations.⁵³ There have been delays in the procurement and delivery of relief materials by contractors to zonal warehouses, which has affected logistical activities. In addition, the failure to carry out direct distribution of disaster relief materials to local governments has made delivery to disaster victims very uncertain.

So far, limited activities have been conducted by NE-MA's zonal office in the southeast regarding erosion. Rescue activities have focused mainly on flooding, fires, and rain/wind storms. Zonal offices mainly organize sensitization workshops on disaster management for civil servants in relevant state MDAs and carry out assessment of disasters that have taken place, thereby providing recommendations for relief assistance to affected communities. For example, in Anambra, an assessment was carried out on erosion, while another was conducted in Ebonyi regarding wind storms.

Recovery and Reconstruction in Agriculture – Ministry of Agriculture

The Federal Ministry of Agriculture is the key Ministry responsible for sustainable land management issues. Its mandate includes the implementation of the national agriculture policy, technical support to land-use planning, soil management, soil capacity evaluation, and soil resource management. The Ministry is divided into various technical departments and soil erosion and watershed management activities fall under the Department of Agriculture and Land Resources. The mandate of the Department of Agriculture and Land Resources includes continuous inventory and assessment of land resources, for agriculture, rehabilitation of degraded land area affected by drought, desert encroachment, soil erosion, and flood.

The Department has four technical divisions dealing with erosion and watershed management: soil and fer-

tility testing, soil survey and land evaluation, soil fertility management, and land use conservation. In addition, there is a specialized GIS and remote sensing division under the Department. Each division comprises a desk officer and five to 10 support staff members. The unit on land use conservation is responsible for conducting studies on erosion in agricultural land. Much of the work on erosion undertaken by this Department is in the form of studies on the causes of land degradation and types of mitigation measures in relation to agricultural land. Proposed projects include farmland erosion control projects focusing mainly on Anambra and Edo states. The department has limited funding of its own and depends largely on the Ecological Fund or other donors for financing.

Recovery, reconstruction and resilience in Water Resources: Federal Ministry of Water Resources

The key ministry at the federal level that is responsible for all matters related to water resources and their management is the Federal Ministry of Water Resources. The Federal Ministry of Water Resources is responsible for policy formulation and coordination of activities relating to irrigation and drainage, conservation, as well as quality and quantity control of inland water bodies.⁵⁴ The Ministry enforces the mandate through its component Departments & Inspectorates (e.g., 12 River Basins, Dept. of Dam & Reservoir Operations, Dept. of Irrigation & Drainage, Hydrological Services Agency (NIHSA)) and the Nigeria Integrated Water Resources Management Commission (NIWRMC). The 12 River Basin Development Authorities (RBDAs) have the mandate to implement projects on erosion control under the FMWR.

River Basin Development Authority (RBDA)

The 1979 River Basins Development Authorities Act establishes and regulates 12 river basin authorities. These are Anambra-Imo, Chad Basin, Cross River, Benin Owe-na, Lower Benue, Lower Niger, Hadeja-Jama'are, Up-

⁵³ Ibid.

⁵⁴ Ropsin, Review of Public Irrigation Sector in Nigeria, Irrigation Institutions Volume III.

per Benue, Upper Niger, Ogun-Osun and Sokoto-Rima. They are parastatals and major implementing arms of the FMWR and are funded by the FMWR. The Director of River Basin Operations and Inspectorate based in the FMWR in Abuja performs the coordination function for all RBDAs. This newly created coordinating secretariat for RBDAs at the federal level is not yet fully staffed.

Since their creation, the RBDAs have undergone some operational and structural changes to improve their relevance and efficiency as spelt out in Decree No 35 of 1986.⁵⁵ The core mandate of the RBDAs is irrigation, drainage, and water supply. Apart from this, the RBDAs are implementation agencies for erosion control projects financed directly by the Ecological Fund, which are within the catchment, as well as constituency projects.⁵⁶ RBDAs are also involved in collecting hydrological data from the basins and continue to do so, although the mandate is with NIHSA.

At present, RBDAs are undergoing an organizational transformation; their future recommended structure will include a division on Integrated Water Resource Management. It is not yet known how this division would explore the possibility of integrated water management and coordinate its functions with the newly formalized Integrated Water Resources Management Commission (IWRMC).

Integrated Water Resources Management Commission (IWRMC)

A Bill is in its final stages (Senate deliberations are completed and it now awaits the President's signature) to establish the IWRMC for the regulation and coordination of water resources development and management. The Commission aims to introduce regulations to ensure efficient water service delivery.

IWRMC will have representative offices within each of the basins, but these would report directly to the feder-

⁵⁵ Commission for the European Communities, Support to the Federal Ministry of Water, Water Resource Management Policy, June 2006, page 10.

⁵⁶ These projects are funded directly by the National Assembly to be implemented in the relevant constituent.

al-level IWRMC and are not governed by a cooperative arrangement of the states. Additionally, the Board of the IWRMC is comprised predominately of representatives from federal ministries and has no state-level representation. The Bill does not refer to existing RBDAs or any succeeding organizations to be established under the draft Water Resources Bill. Relationships between the IWRMC and both existing and proposed organizations are not clearly defined. In addition, the IWRMC seems to focus mainly on regulating public and private water services, without specific attention to adverse basin-wide environmental impacts, such as: (i) the impact of large water diversions for further irrigation development on floodplain communities & fisheries, and (ii) basin-wide flooding caused by high spillway discharges.⁵⁷

At the state and local government level, the IWRMC will carry out its functions by establishing a catchment management officer (CMO) in each of the eight hydrological zones. The CMO will have multidisciplinary professional staff, headed by a water resources management professional with a rank not lower than that of a civil service Deputy Director. CMOs for each hydrological zone will be set up essentially as line departments of the IWRMC. This approach conflicts with the concept of integrated water resources management and cooperative state governance of river basins. There is no clear definition of which functions will be delegated to the eight CMOs. The advisory Catchment Committees are headed by a CMO with wide representation from federal water resource development and public water service provider agencies, NIHSA, the State Water Board, State Emergency Management Agency, and community organizations. These Catchment Committees will advise the CMO on the implementation of the Commission's functions.

National Hydrological Services Agency (NIHSA)

NIHSA is the custodian of all water resources data. The Agency was established by the Federal Executive

⁵⁷ Aide Memoirs for the Irrigation and Water resources Management project, Joint World Bank and FAO Identification mission (28th February – 15th March, 2011)

Council Approval EC 18 (07) 4 of May 16, 2007. Specifically, it provides services required for assessment of the nation's surface and groundwater resources in terms of quantity, quality, distribution and availability in time and space; for the efficient and sustainable management of water resources it operates and maintains hydrological stations nationwide and carries out groundwater exploration; and finally it is responsible for monitoring, using various scientific techniques in order to provide hydrological data needed for planning, design, execution and management of water resources and allied projects.

The Act establishing the Agency provides for a Board in order to allow NIHSA to carry out its mandate independently and maintain an autonomous budget. The Governing Board includes a Chairman and representatives of FMAWR, NIMET, three public figures, and Director General of Agency. The powers of the Board include, among other things, formulating policies and guidelines to supervise management and draft regulations regarding data collection. However, the Board that has been named is yet to be inaugurated and the Agency is currently headed by an Acting Director General, which means NIHSA continues to depend on the FMWR for its budget.

There are other agencies involved in collecting hydrological data, but for specific purposes, such as power generation (PHCN), water transportation (NIWA), water supply (State Water Boards), irrigation (RBDA), and enforcement (NESREA). The Agency collects data through various means: direct field measurements of relevant parameters; secondary sources, such as other agencies involved in hydrological data collection; Project Reports, Dissertations and Publications; and collaboration with international and local agencies on data collection activities.

There are six departments within the Agency, one for general services (Administration and Finance) and five technical departments: Hydrology, Hydro Geophysics, Hydrogeo Information, Operational Hydrology, and Engineering Hydrology. There are various Units, such as Legal, Audit, Procurement, etc. that function directly under the office of the Director-General.

NIHSA's activities and functions have a direct relationship to the management of watersheds. NIHSA provides data to federal and state MDAs, such as the Ministry of Environment, RBDAs, and international organizations, such as FAO and UNDP. For example, the agency has shared its study on special catchment areas, program on gathering of sediment transport data, hydrological mapping, baseline data for all required floodplain mapping, etc. The agency additionally collects hydrological data on watersheds across the eight hydrological zones. EFCZM Department's flood forecasting, monitoring and control division uses hydrology information from NIHSA for flood forecasting and floodplain zoning.

National Water Resources Institute (NWRI) in Kaduna

The NWRI is a training institute, located in Kaduna. It is a parastatal organization under the FMWR, designated to provide capacity-building training and education, as well as data collection and dissemination services in the field of water resources development and management. NWRI is currently conducting research on water quality for domestic use, sedimentation levels of selected dams/reservoirs and their downstream socio-economic impacts on communities and on causes of flooding. Core functions of the institute include promoting and developing training courses on Water Resources (Regular and Short Courses), carrying out capacity development assessments of sector organizations, and providing skill-oriented training courses.

Flood resilience: Federal Ministry of Environment (FMENV), Department of Erosion, Flood and Coastal Zone Management (EFCZM)

Given the FMENV's mandate to supervise all environmental activities in Nigeria, it is the central authority for activities related to flood resilience issues. The FMENV's overall core functions include: (1) defining the policy, legal and regulatory framework for environmental management, including assisting in collaboration with sectoral ministries and stakeholders; (2) environmental monitoring, data collection, and analysis; (3) EIA

BOX 1: Ecological Fund

The Ecological Fund is a funding resource to support initiatives that promote improved environmental management. The fund is financed through an annual provision of 2 percent of the Federal Budget. The Secretariat of the Fund is located in the Presidency and is responsible for processing all requests for funds, documentation of all disbursements, monitoring and co-ordination and general administration of the funds. The fund allocation is decided by the National Committee on Ecological Problems, which is chaired by the Minister of Environment and includes representatives from various line ministries and the River Basin Development Authorities (RBDAs). It has four technical subcommittees that include (1) Desertification, (2) Erosion, (3) Gas and Oil, and (4) General Environmental matters. Each of these subcommittees recommends projects to the National Committee for financing.

The subcommittee on Erosion included technical representatives (mostly permanent secretaries) from the various ministries at the federal and state levels (Environment, Agriculture, and Works), relevant agencies and the CEOs and Managing Directors of Operations of all the River Basin Development Authorities.

review, training, and clearances, including environmental education and public awareness; (4) managing ecosystems and promoting sustainable use of natural resources; and (5) setting and enforcing environmental quality norms, standards and rules.⁵⁸ The Ministry was created by incorporating environmentally relevant units from numerous sector ministries, such as Water Resources, Agriculture, and Works, and it comprises five technical departments. These include: (i) Forestry; (ii) Drought and Desertification; (iii) Erosion, Flood, and Coastal Zone Management; (iv) Environment Assessment; and (v) Pollution Control and Environmental Health. At first, the Department of Soil Erosion and Flood Control of the Federal Ministry of Water Resources was transferred to the now-defunct Federal Environmental Protection Agency (FEPA). Later, with the creation of the Federal Ministry of Environment, the Department merged with the Flood and Erosion Control Division of the Federal Ministry of Works to form the current Department of Erosion, Flood, and Coastal Zone Management (EFCZM) in the Federal Ministry of Environment in 1999.

The EFCZM Department consists of four divisions: Coastal Zone Management; Soil Erosion Monitoring

& Control; Flood Forecasting, Monitoring, & Control; and Water Management & Harvesting. The EFCZM Department is involved in policy formulation, as well as implementation of erosion projects funded by the federal government, Ecological Fund, and international donors.

The EFCZM Department receives funding from the federal budget, the Ecological Fund, and international donors. Ecological Funds has been the main source of funding for erosion projects. Funding is allocated according to project proposals approved by the Fund.

The federal budget allocations for environmental management have often been limited, since what is approved and what is disbursed do not often match. For example, a project is designed according to the allocated funds, however once work on a project commences the allocated funds are not released or may be reallocated to another project. This has led to projects getting implemented at 50 percent or less in certain cases.

Long-term resilience

Cutting across all the points is the fact that institutional capacities for action need to be strengthened. For example, planning and preparedness need to be carried out with good coordination and participation both ver-

⁵⁸ According to the 1999 Presidential Order.

tically (federal, state, local) and horizontally (across sectors). Clear responsibilities and mandates need to be identified and various actors empowered to participate in multi-sector, multi-scale work, especially on long-term planning, policy and public expenditure management. Regulatory development and enforcement need strengthening at all levels to transform planning processes into muscular tools that can deliver public goods and protect private benefits. Lastly, governance issues such as contracting irregularities and supervision challenges have been known to interfere with putting durable infrastructure in place. Specific deficiencies include:

- No integrated water resources planning at national, state, or international transboundary levels, and weak integration of climate variability into planning;
- Weak territorial and town/community planning, and enforcement of plans, with few incentives in place to transform the status quo;
- Readiness and preparedness for flood and other disaster responses (i.e., erosion, drought) are weak at all levels, from the community level up to the federal level;
- Weak community land use bylaws, although there are some isolated good examples in Nigeria of, for example, controlling bush burning or of community forest management;
- Room for improvement in public expenditure planning and execution on long-term, multi-sector, and multi-scale planning and investment.

The points above are becoming the norm due to weak contracting, supervision, and regulatory development and enforcement;

For long-term resilience, Nigeria's institutions at all levels will need to be better networked with one another and with people on the ground to be able to prepare for, respond to, and prevent impacts from flooding events. Federal planning and data collection agencies will need to be strengthened to provide more efficient, effective, and coordinated service delivery, especially on early warning systems. Federal and state emergency management agencies need a full program of capacity

support to be able to carry out their mission. State and local governments have attempted to provide limited support for extreme weather events in isolated settings but also face capacity constraints. Communities are left "shooting in the dark."

7.4 Action Plan

With the majority of damages and losses coming from just two sectors, housing and agriculture (52 percent and 22 percent of total damages and losses, respectively), recovery of these sectors must be prioritized and properly sequenced while ensuring that other affected sectors are not left unaddressed, and that recovery and reconstruction needs having multi-sectoral implications (such as the restoration of transport infrastructure) are given priority to ensure a robust recovery.

In order to address the most urgent needs of the housing and agriculture sectors alongside those of other sectors, the tables below present the needs for recovery and reconstruction in all sectors, prioritized in three tiers. It is important to note that the prioritization was carried out by the assessment team and should be vetted and possibly reordered during the follow-up recovery planning workshop. Implementation of Priority 1 needs should begin immediately, whether they are short- or long-term interventions; many will overlap with the implementation of tier 2 and 3 needs. The timeframes for these interventions are meant to be indicative only, as institutional arrangements, financial support, and other factors will influence timetables and lengths of involvement. Following the tables, details about each sectoral recovery plan provide guiding principles for each sector and can help in establishing goals and milestones while implementing recovery.

Table 7.1: Priority 1 Recovery and Reconstruction Activities

Sector	Need	Activities	Estimated Cost (million Naira)	Responsible	Indicative Timeframe
Housing	Immediate Recovery	Temporary shelter program	42,409		Short term
		Demolition, cleanup, and environmentally-safe disposal of debris and mud			
	Flood-Resilient Housing Design	Determine technical flood-resistant housing designs and construction guidelines for reconstruction	3,594		Short term –2014
		Train artisanal workers in safer house construction			
	Soft-term credit program for housing reconstruction and replacement of household goods	Make low-interest, long-term loans available through the central, development, and private banks for creditworthy homeowners facing reconstruction	252,373		Q2 2013–2014
	Financial support for reconstruction of housing for the poor	Provide cash grants and/or in-kind donations of construction materials for the reconstruction of housing for the poor and replacement of household goods	355,856		Q2 2013–2014
Site planning and preparation for relocation of affected populations to safer sites	Determine and acquire suitable locations for relocation of communities occupying unsafe areas (flood plains)	8,096		Q1 2013–Q4 2013	
	Plan and install minimum basic services (water, sanitation, electricity)				
Transport	Restore road transport routes	Reconstruction of primary roads and structures (federal)	55,233		Q1 2013–Q4 2013
		Reconstruction of secondary roads and structures (state)			
	Reconstruction of bridges and culverts	7,080		Q1 2013–Q4 2013	
Agriculture	Immediate food assistance	Provide food assistance to farmers who lost their food stocks in the floods	–		Short term
	Agricultural inputs for next crop	Provision of flood-resistant seeds, fertilizers, and pesticides to ensure upcoming harvest	54,594		Short term
	Recovery package for livestock and fishery owners	Provide package to over 600,000 affected livestock and fishery owners to enable restart of their businesses	59,644		Q1–Q2 2013

Sector	Need	Activities	Estimated Cost (million Naira)	Responsible	Indicative Timeframe
Health	Cleanup and disinfection	Demolition, cleanup, and environmentally-safe disposal of debris and mud; Disinfection of functioning and temporary clinics to prevent further disease spread	32		Q1–Q3 2013
	Temporary clinics	Set up temporary health care centers to compensate for decreased capacity of affected centers	1,989		Short term
	Additional temporary health care programs	Provide health care for an increased number of individuals after the floods	2,410		Short term
Education	Demolition and debris removal	Demolition, cleanup, and environmentally-safe disposal of debris and mud	364		Q1–Q3 2013
	Continuation of current school year	Payment of overtime to teachers to compensate for education lost to students	11,778		Q1–Q2 2013
		Rental of temporary school premises			
Psychosocial attention	Provide psychological and mental health services to affected communities, especially vulnerable populations, to help them cope with the effects of the disaster	3,069		Q1–Q4 2013	
WASH	Restoration of water supply and sanitation facilities	Provision of potable water, water quality control and testing, cleaning of water supply sources	?		Short term
Water Supply & Sanitation	Reconstruction of water supply and sanitation	Reconstruction and repair of water supply infrastructure, such as tube wells and boreholes, and of sanitation infrastructure such as latrines, all with more flood-resistant design	18,432		Q1 2013–2014
Income Generation	Temporary “cash-for-work” program	Fund and oversee a “cash-for-work” scheme that allows affected individuals to work towards recovery and reconstruction to make up for lost income due to flooding	69,000		Q1–Q3 2013
Commerce	Cash grants for micro-traders	Provide cash grants to micro-traders to replenish working capital and loan rescheduling	1,896		Q1 2013–2014
Disaster Risk Reduction	National Disaster Risk Management	Strengthen Risk Assessment, Forecasting and Early Warning and Disaster Preparedness (short-term needs in 1a, 1b, 1c of Table 5.2) Disaster Risk Reduction in Key Sectors (short-term needs in Table 5.2)	6,443		Short term–2014
Disaster Risk Reduction	State and Local Disaster Risk Management	Resilient Urban and Rural Development Planning (short-term needs in 2a and 2b for identified communities)	1,125		Short term–2014

Source: Estimations by the Assessment Team using official information.

Table 7.2: Priority 2 Recovery and Reconstruction Activities

Sector	Need	Activities	Estimated Cost (million Naira)	Responsible	Indicative Timeframe
Agriculture	Irrigation infrastructure replacement	Irrigation infrastructure reconstructed with flood-resistant measures and replacement of equipment	1,600		Q3 2014–2014
Health	Reconstruction of hospitals and clinics	Rebuild destroyed health centers using flood-resistant measures and repair and retrofit damaged centers	14,742		Q2 2013–2015
	Replacement of furniture and equipment	Replace necessary furniture and medical equipment	4,355		Q2 2013–2015
	Replacement of destroyed medical supplies	Restock medical supplies, such as medicine	4,471		Q2 – Q4–2013
Education	Reconstruction of safe schools	Reconstruction of destroyed schools with disaster-resilient standards	100,959		Q2 2013–2014
		Repairs and retrofitting to partially damaged schools			
		Replacement of furniture, equipment, and materials			
Commerce	Soft-term credit lines for SMEs	Provide soft-term credit lines for SMEs to finance the repair and reconstruction of their enterprises	1,464		Q2 2013–2014
		Provide soft-term credit lines for SMEs to finance working capital lost in the floods, as well as the rescheduling of non-performing loans	657		
Manufacturing	Soft-term credit lines for SMEs	Provide soft-term credit lines for SMEs to finance working capital lost in the floods, as well as the rescheduling of non-performing loans	1,547		Q2 2013–2014
		Provide soft-term credit lines for SMEs to finance the repair and reconstruction of their enterprises	3,064		Q2 2013–2014
Disaster Risk Reduction	National Disaster Risk Management	Strengthen Hydro-met services, disaster preparedness (medium-term actions ¹ a, b, and c in Table 6.2)	7,728		2015–
	State and Local Disaster Risk Management	Implementation of Resilient Urban and Rural Development	20,000		2015–

Source: Estimations by the Assessment Team using official information.

Table 7.3: Priority 3 Recovery and Reconstruction Activities

Sector	Need	Activities	Estimated Cost (million Naira)	Responsible	Indicative Timeframe
Transport	Repair and reconstruction of roads, culverts, and drainage works	Reconstruction of tertiary roads	5,602		Q4 2013–2015
Health	Prevention campaigns	Training for and launch of disease prevention and vector control campaigns	18		Q3 2013–2015
Electricity	Replacement of damaged electrical equipment	Replacement and repair of damaged electrical equipment and backup equipment	337		TBD
Manufacturing	Soft-term credit lines for repair and reconstruction of large industries	Provide low-interest soft-term loans for large industries to reconstruct and repair flood damage, some of which may already be insured	24,407		Q3 2013–
	Soft-term credit lines for capital financing and loan rescheduling for large industries	Provide low-interest soft-term loans for large industries to replenish raw materials, restore operations, and reschedule non-performing loans	4,397		Q3 2013–
Disaster Risk Reduction	Disaster Risk Reduction in Key Sectors	Flood prevention measures (medium- to long-term actions in 3 Table 6.2)	34,784		2015–

Source: Estimations by the Assessment Team using official information.

Sectoral Recovery Plans

Housing

The vision in the housing and settlements sector is to undertake recovery and reconstruction efforts through appropriate and sustainable methods that will not only provide shelter to the affected people but also help in building livelihoods, creating employment, and reducing poverty. The recovery and reconstruction program supports the current National Housing Policy thrust of providing decent shelter to all Nigerians. The guiding principles of this plan are to be:

- In line with existing national policies and plans on housing, settlement development, poverty reduction, etc.;
- Community driven, with active participation by the beneficiaries;
- In line with the traditions of the beneficiaries;

- Based on building better and flood-proof housing and settlements;
- Designed with coordinating mechanisms in place to ensure effective participation of all relevant institutions and stakeholders;
- Supported with effective resource mobilization for further follow-up and timely implementation of all recommendations.

Major assumptions for the proposed strategy and recovery outputs are:

- Many poor households cannot afford the cost of reconstruction of dwellings by themselves and should be assisted with grants;
- Some middle- and high-income earners may be able to afford to individually rebuild their houses, using soft-term credit lines;

- Efforts must be made to ensure that all reconstructed and newly built houses are flood-proof;
- Skills and knowledge of building are available in the communities; what is needed is to train more hands to meet the demand.

Education

The goal of the recovery process in the education sector is to re-establish educational services in the flood-affected areas to a standard equal to or better than what existed before the disaster. The recovery and reconstruction process in the education sector is affected by the strategies in a number of other sectors. These include:

- The repair and reconstruction of schools has to be carried out in collaboration with the water and sanitation sector, in order to make sure that schools are equipped with drainage facilities, adequate water supply, and latrines (separate for boys and girls, and accessible for people with disabilities).
- Close collaboration with the nutrition sector should focus on developing strategies for the provision of sufficient food to families that have been adversely affected by the floods, resulting in little food at home, including for school-going children. The school feeding program that existed prior to the floods should be restored, and the introduction of similar program in states where they do not exist should be considered, be it for the short- or long-term. Moreover, the provision of micronutrient supplements (such as vitamins, iron, and iodine), and de-worming to treat parasitic infections can be organized together with the nutrition sector.
- In cases in which schools are still being used as shelters for internally displaced persons, the education sector should collaborate with the housing sector to find alternative housing for the families concerned, to restore educational activities, and to ensure that the facilities are returned in a useable state.
- Also gender, disability and child protection concerns need to be raised with the appropriate authorities. This is especially true in cases where children are attending a different school after theirs was destroyed

by the floods, as this puts them—especially girls—at risk of dropping out. Special attention has to be paid to children with disabilities, as the post-flood situation might make it more difficult for them to attend school. Lastly, the use of damaged buildings for classes causes protection risks that must be addressed.

Health

Health sector recovery needs basically consist of treating injured and displaced persons, both physically and psychosocially, conducting immunization campaigns, and monitoring/controlling disease outbreaks. Shoring up this sector also involves vector control and the provision of special nutrition supplements to children. Reconstruction needs in this sector include the construction of hospitals and clinics and the refurbishment of damaged and/or procurement of new equipment. This vision for health sector recovery and reconstruction is meant to facilitate and fast-track the achievement of health development goals in the sector, in line with the national strategic plans and vision, in such a way as to “build back better.” The guiding principles forming the foundation upon which this vision will be realized are as follows:

- Rapid rebuilding of livelihoods: there is a need to rapidly jumpstart local economies and a critical need for the revitalization of production, trade, and creation of income and employment opportunities. As the need arises, innovative strategies and a conducive environment are critical to achieving early recovery. The direct and indirect effects of this will also form the backbone of recovery in many sectors, including health.
- Community involvement and ownership: Recovery is faster when communities are involved and carried along. This principle encourages collaborative decision making in planning, design, and implementation, and promotes community ownership and empowerment, while encouraging the implementation of locally appropriate and affordable solutions.
- Focus on the most vulnerable and socially disadvantaged groups: Disasters increase the vulnerability of all, but especially of those who are already dis-

advantaged. Recovery programming needs to give priority to the most vulnerable groups, including female-headed households, children and orphans, and the poor, and take into account those with special needs, so that they are not overlooked.

- **Secure developmental gains:** Recovery efforts must, as a rule, seek to re-establish and secure developmental gains without comprising development in non-affected areas. In the health sector, recovery should present an opportunity to incorporate resilience that otherwise would have been neglected. This principle also takes into consideration any major setbacks in pre-disaster progress achieved towards meeting sector MDGs and other national/regional targets, and proposes measures for bridging such gaps in the course of regular development.
- **Building back better and long-term disaster management:** Recovery plans will take into consideration the need to build back in such a way that health infrastructure and assets are more resilient to future disasters to a large extent. In making the sector less vulnerable, employ the principles of practicability, simplicity, appropriateness, social acceptability of methods and technology, and affordability, while stressing the importance of participation by host communities in a spirit of self-reliance and self-determination.
- **Coordinated and coherent approaches to recovery:** Health sector recovery and reconstruction will be built on the full and effective coordination and collaboration with other relevant sectors through information exchange, flexibility in administrative procedures, and uniformity in policies. This should be done in such a way that they complement one another and build upon their respective activities.
- **Restoring capacity to manage the recovery process:** it is critical that the capacity of local public administrations be rebuilt to manage the recovery process. In addition, local and national institutions, as well as civil society and the private sector, should be encouraged to join in the recovery process by committing both human and financial resources.
- **Transparency and accountability:** Achieve transparency through open processes and the wide dissemination of information on all aspects of the recovery process.

Agriculture

The 2012 flood caused losses to food crops amounting to ₦305,070.1 million and affected livelihoods. Indeed, large areas of agricultural land were inundated just before harvest time. Food prices in many flooded areas have risen by 30 to 70 percent, increasing food insecurity among the affected populations. To facilitate their recovery and ensure their food security, a number of actions must be taken in the short and medium/long term. These include immediate food assistance, provision of agricultural inputs, a recovery package for livestock, and a recovery package for fisheries.

To ensure the timely and effective planting of the next harvest, an estimated ₦54,600 million is required for the provision of flood-resistant seed varieties to farmers, together with fertilizers and pesticides.⁵⁹ The Ministry of Agriculture (MARN) has already begun assisting affected farmers and has been providing in-kind food assistance to those that sustained destruction of their food stocks due to the floods.⁶⁰

In addition, an estimated ₦22,500 million is required to provide a recovery package to 375,000 affected livestock owners, which includes for each household 10 immunized pullets, a mature cockerel, two goats or sheep, and veterinary assistance for these animals.⁶¹

The fishery subsector will require an estimated ₦37,100 million to provide 240,000 affected fisher folk with of fingerlings and the fisher feed needed to restart their business.⁶²

The only cost of reconstruction in this sector—estimated at ₦1,600 million—is that of rebuilding and re-

⁵⁹ In the case of food crops, needs have been estimated at 18 percent of the value of production losses.

⁶⁰ As indicated in the social sector recovery program, the value of food assistance should be deducted from the “cash-for-work” program in the case of the agriculture sector.

⁶¹ This so-called recovery package in fact includes the partial restoration of capital assets and animal health prevention needs.

⁶² This fishery “recovery” package in fact refers to restoring the capital assets of aquaculture, which explains why needs exceed the value of production losses in the sector.

pairing irrigation channels and equipment that were destroyed by the floods, whose functioning is essential to ensure full water availability during future dry seasons. In that sense, these reconstruction works are urgently required to avoid additional production losses in crops requiring irrigation.

Commerce and Manufacturing

In manufacturing, needs refer to working capital requirements and non-performing loan rescheduling to ensure recovery of production for the affected small, medium and large industries. The funding is to be channeled through special, soft-term (in both interest rate and repayment terms) credit lines that should be made available through the development and private banks.

In the case of affected traders, only micro-traders and SMEs are included, since no large traders were reportedly affected. Their immediate need is for working capital to acquire goods to sell and meet some operational requirements, as well as to reschedule non-performing loans. Recovery needs in this sector include cash grants to micro-entrepreneurs and soft-term credit lines for creditworthy traders, channeled through the private banks.

The reconstruction needs of affected small- and medium-sized enterprises (SMEs) as well as those of large industries have been estimated at ₦3,065 million and ₦24,400 million, respectively.⁶³ These amounts should be channeled through special, soft-term credit lines to be opened via the development and private banking system.

In the case of the commerce sector, reconstruction needs have been estimated at ₦1,465 million, to enable traders to rebuild their physical facilities using improved quality standards and flood-resilient features.⁶⁴

⁶³ To estimate these manufacturing reconstruction needs, the value of damage for SMEs has been increased by 35 percent, and the value of damage for large industries was increased by 25 percent, in order to allow for an improved technological design that involves modernization and the introduction of flood-resilient characteristics.

⁶⁴ In this sector, reconstruction needs were estimated at 125 percent of the estimated value of damage to physical facilities, to allow for modernization and the introduction of flood-resilient standards.

Water and Sanitation

The vision of Water supply, Sanitation, and Hygiene (WASH) is to bring about success in related issues in Nigeria. National policies on water supply, sanitation, and hygiene are in varying stages of implementation, with greater progress being made in water supply. Policy implementation remains a great challenge, while sector investment strategies are absent. There is little emphasis on disaster risk reduction, or on standard operating procedures to enhance scope for timely, proportionate responses to emergencies. Development programs with external support is primarily project-focused, covering both urban and rural needs. National programs to install filtration plants at local government levels have not succeeded, owing to poor planning, design, and maintenance. Overlapping mandates among government ministries and agencies pose serious challenges to WASH sector coordination.

The key principles for the proposed strategy include:

- Re-establishing WASH services, not simply repairing or replacing infrastructure;
- Ensuring that proper and skilled service management providers are available to operate and maintain assets, deliver services, and recover costs;
- Creating new models for rural and urban water supply, sanitation, and hygiene service delivery that are customer-focused, performance-driven, and financially sustainable;
- Ensuring that experienced managers, skilled technicians, and sound operating systems are maintained and that private sector expertise is tapped into;
- Providing hygiene education and ensuring water conservation; and
- Encouraging better disaster preparedness; in the absence of new management structures, however, such knowledge is unlikely to be retained or used.

Electricity

The 2012 floods did not have devastating effects on the electricity subsector, however, considering the overall

importance of the sector within the entire economy and the fact that the sector is currently undergoing privatization, efforts should be made not only to expand generating, transmitting, and distribution infrastructures, but also to make existing installations functional and optimize their capacities. Meeting some conditions during the privatization process could be useful in achieving a stable electricity supply. These include:

- Ensuring global competitiveness in the management of the subsector;
- Making investments in the subsector very friendly;
- Improving regulatory oversight; and
- Demonstrating greater commitment by the government to expand and make the subsector truly functional.

It is self-evident that the dismal performance of the sector is a key factor in the overall economic environment of the country.

Transport

The enormity of the damage on the road sector requires strategic planning in order to meet up with the reconstruction needs in the short, medium and long terms. Medium-term intervention would require bringing the roads to pre-flood levels through the reinstatement of washout road embankment/pavement layers and damaged hydraulic structures (bridges and culverts). It is also necessary that damaged sections of strategic roads at the federal, state and local government levels be repaired and made functional before the onset of the next rainy season, as a medium-term plan.

Long-term plans would need to incorporate innovative approaches to road construction through research and development for improved resilience of road pavement and hydraulic structures in the face of the challenge posed by climate change. This would bring about improved design as well as improved construction techniques. The rehabilitation of alternative routes is also necessary, especially with respect to the Ilorin-Jebba-Mokwa federal road. The construction of the proposed second Niger Bridge is a matter of utmost national priority. The state and local governments need to adopt

similar measures in the construction of viable alternative routes. In order to meet these construction needs, a thorough analysis of basic units of construction materials and labor was taken into consideration.

Institutional and Implementation Arrangements

Presently, the National Emergency Management Agency (NEMA) at the federal level and the State Emergency Management Agencies (SEMAs) at the state level, along with relevant offices of the local governments, are mandated to manage relief, recovery, and reconstruction. However, considering the scale of the disaster and challenges related to such large-scale recovery and reconstruction efforts, drawing from certain guiding principles based on international experience could help to improve the effectiveness of the recovery program. These principles are summarized below.

Although the government is presently involved in relief efforts, international development partners will want to see a credible institutional mechanism in place for recovery and reconstruction as early as possible in order for them to consider mobilizing longer-term commitments of financial support. Therefore, it will be important for Nigeria's federal government to articulate its strategy for governing reconstruction efforts and to signal to donors its commitment to an effective, transparent, and accountable mechanism for the management and implementation of these resources.

Disaster Risk Management

In order to ensure flood resilience, all recovery and reconstruction efforts should be based on the principle of managing floods and integrating the concept of living with floods, protecting key assets, and minimizing losses. Recommendations to further strengthen Nigeria's flood disaster management capacity are presented in an earlier chapter under three categories: (i) Strengthen DRM and Climate Change Adaptation; (ii) Build Community Resilience; and (iii) Develop disaster and Climate Change Resilience in Key Sectors. These will have to be considered when finalizing priorities for the recovery and reconstruction framework.

Key Premises of Proposed Institutional Arrangements

1. **Delivering a Recovery Program: Fast, Efficient, Transparent, and Accountable:** Institutional arrangements for recovery must be founded on the principle of delivering a recovery program with greater flexibility and speed while maintaining accountability and transparency.
2. **Institutionalizing lessons learned:** Decisions on institutional arrangements should be based on sound lessons drawn from both national and international experience.
3. **Building capacity to manage future disasters:** Flood recovery should work to develop the long-term capacity to manage and mitigate disasters in the future.

Core Structure of Proposed Institutional Framework

Central coordination and local implementation should be key features of whatever institutional framework is ultimately established:

1. **A central coordinating agency is the backbone for:**
 - a. Mobilizing a global fundraising campaign;
 - b. Managing multi-source funding and coordinating with donors;
 - c. Developing an overarching policy framework, standards, and principles;
 - d. Ensuring equity/quality across the country; and,
 - e. Implementing federal projects.
2. **Local governments are the key for actualizing recovery:**
 - a. Implementing a recovery program: planning, designing, approving, and implementing;
 - b. Monitoring;
 - c. Managing grievance redress.

Key Requirements

Implementation

- Prioritizing immediate implementation support to local governments directly in the short term and a program of capacity building over the long term.
- Matching greater flexibility and speed of implementation with greater ex-post accountability.
- Maintaining realistic reconstruction policies and plans while exploring innovative and ambitious approaches for implementation: Planning conservatively to ensure that sufficient time and funds exist to complete reconstruction while developing innovative efficiency mechanisms (i.e., in procurement/contracting).
- Realize that no “one size fits all” approach will work: Develop sector- and geographic-specific approaches.

Fiduciary governance & oversight

- Channeling funds into the hands of those with the strongest incentive to use them for the intended purposes: This includes direct transfers to recipients and community-driven implementation and oversight.
- Maximizing credibility through an independent oversight board, Ombudsman, third-party monitoring and a grievance redress mechanism: Involving prominent citizens and professionals.
- Utilizing substantive real-time financial reporting/fiduciary arrangements to ensure transparency and accountability and maintain credibility for beneficiaries and donors, matching greater flexibility and speed in public financial management with greater ex-post accountability.
- Utilizing both on-budget and off-budget support.

Coordination

- Managing multi-source funding and providing overarching guidelines: Coordinating and prioritizing fund flows and developing overarching guidelines.
- Overseeing public information and relations, including coordination, facilitation and harmonization with donors and the international community.

Ten Steps in Designing, Building, and Sustaining Results-Based M&E Systems

Traditional results-based M&E systems can be built and sustained by following the ten steps outlined below. With some modifications, these steps can be applied to the Nigerian context to create strong M&E systems.

1. Conducting a readiness assessment
2. Agreeing on outcomes to monitor and evaluate
3. Selecting key indicators to monitor outcomes
4. Determining baseline data on indicators – where are we today?
5. Planning for improvements – selecting results targets
6. Monitoring for results
7. Defining the role of evaluations
8. Reporting findings
9. Using findings
10. Sustaining the M&E system within the organization

Source: Kusek and Rist 2004.

Example of Grievance Redress Mechanism in the Pakistan Earthquake of 2005

The Earthquake Rehabilitation and Reconstruction Authority (ERRA) set up after the 2005 disaster in Pakistan had a grievance redress mechanism from which useful lessons might be drawn. The mechanism was of a fast-track and informal nature, operating at the community (village) level and mostly run by partner organizations, which included local and national NGOs. On a formal level, various local government offices at the sub-province (district) level were put in charge of addressing and resolving complaints. To deal with complaints regarding registration, data errors, and payment records, the national-level government authority dealing with the registration of individuals and issuance of identity cards was given the appropriate authority at the sub-provincial (district) level, as it already had “data registration offices” in these locations.

However, the system was not without its share of problems. Notably, most local-level records were kept manually, which led to significant delays at the time of complaint registration and to a sense among staff of being overwhelmed. However, the system itself was MIS-based at headquarters.

Source: ERRA.

- Bridging relief efforts, early recovery, and long-term reconstruction.
- Coordinating reconstruction efforts throughout the country.

7.5 Next Steps

Once the PDNA findings are accepted, it will be important for the government to adopt a fairly consultative yet relatively speedy process for finalizing the recovery and reconstruction framework. This will include:

1. Finalizing guiding principles for recovery and reconstruction (see Section 7.2).
2. Agreeing on the priorities, timeline, and budget under the Action Plan (see Section 7.4).
3. Finalizing financing arrangements, including consultations with MDAs and development partners, such as the World Bank, to assess which actions can be supported by ongoing or new interventions and which actions will need new funding from the national government.
4. Adopting an effective implementation arrangement (see Section 7.4, Key Premises of Proposed Institutional Arrangements), including monitoring and evaluation systems).
5. Ensuring that recovery and reconstruction planning and implementation can lead to flood resilience (following recommendations from Chapter 6 on Disaster Risk Management).

Given the federal system of government in Nigeria, an action plan that supports national interventions related to strengthening disaster risk management, climate change adaptation, water resources management (for example, dam safety and river dredging), and other sectors, with matching local interventions by the states (see “build community resilience” and “invest in infrastructure” in Chapter 6, Table 6.2) for recovery and reconstruction. The bulk of the intervention will be needed at the local level, involving communities, to ensure that they are not only recovering from this flood but are prepared for similar future events.

Mainstreaming PDNA

This assessment is a first effort in Nigeria to conduct PDNA on such a large scale. The PDNA exercise has offered an opportunity to train federal and state officers and to develop a national roster of PDNA experts. To keep up the momentum and sustain these capacity-building efforts, it will be important for NEMA to develop a PDNA platform, in which baseline data, damage collection data templates, training materials, and the contact information of trained staff are stored. Some of these points are discussed in detail below:

- *Data readiness*: NEMA will need an online platform to host all the baseline and damage data collected during the current PDNA exercise, so that it is available for all subsequent exercises, as well as for research purposes. More importantly, developing a current baseline will be important to enabling readiness for any future disaster response.
- *Team’s capacity-building and simulation exercises*: To sustain the current capacity-building efforts, it will be important to follow up with routine training and simulation exercises. New DRM centers in universities can play a key role in this regard.
- *Roster of PDNA experts*: The names and contact information of all trained PDNA experts in the country should be archived by NEMA to ensure that properly trained and experienced experts are available for any future disaster assessments.
- *Learning and feedback loops*: It will be important to adapt the PDNA methodology to the Nigerian context. Thus, learning from the current PDNA, and receiving feedback from the team will be of the utmost importance to NEMA. Ideally, a session on lessons learned should be organized, and knowledge notes developed in order to learn from this exercise and plan for future ones.
- *Information flow and decision support system*: Information flow before, during and after a disaster plays an important role in the resiliency of a country or a state. Thus, maintaining an efficient information and decision support system will be at the heart of mainstreaming PDNA methodology. Such a system will help the government to respond more quickly to

a disaster, to make informed and efficient decisions, as well as to plan recovery and reconstruction efforts.

- *Dedicated resources for PDNA, and disaster response:* The government of Nigeria has invested in disaster response over the last few years, as evidenced by the development of NEMA, SEMA, and local EMAs. However, to be more efficient in responding to disasters, effective assessment and response mechanisms are needed. A dedicated budget and credit line for undertaking national and state PDNAs, as well as for relief, recovery, and reconstruction, will be needed to sustain current capacity-building efforts.



ANNEXES

Annex 1: Breakdown of 2012 Flooding Situation in Nigeria - NEMA

S/ No	Location of Flood	Causes in the Identified Location	No. of Affected/ Displaced Persons (IDPs)	Estimated Amount of Infrastructure/Properties lost	Estimated No. of Deaths
1	Abia State	Rainfall, windstorm, and fire of June 26, 2012	*2,643		L = 2
	Umuamano-Iheiyi Community in Ugwuagbo LGA, Nlugu in Obingwa LGA, and Ode-Ukwu in Osisioma LGA				
2	Adamawa State	Persistent rainfall resulting in the release of water from the Lagdo Dam in the Republic of Cameroon on August 24, 2012	**46,030 currently in refuge at 12 IDP camps. The number is increasing by the day, as the release of the water has not abated and is expected to continue as long as rainfall swells the dam.	Destruction of houses and farmlands washed away, worth millions of Naira.	L = 21
	Kofare, Damilu, Saminaka, Rugangr, Njiboliyo, Yeldifate, Jada, Shuwa, Lumadu, Jhau, Kwambula, Kirchinga, Beman, Dubangun, Ngodogurun, Tino Kogi, Nasarawo-Demsa, Nzugaling, Zuran, Dwam I, Belachi, Bare, Greenvillage, and Ngalag communities	Torrential rainfall of August 20, 2012			L = 15
3	Akwa-Ibom State	Rainfall of August 2, 2012	** 847	Destruction of 70 Houses	L = 0
4	Anambra State	Heavy precipitation and release from Jebba and Kainji hydroelectric power Dams	** 9,964	Destruction of residential homes, places of worship, markets, schools, hospitals and farmlands; Orient Petroleum Resources Oil Well totally submerged.	L = 0
	Ogbaru, Ekwusigo, Anambra East and Anambra West Local Government Areas: Aguleri-Otu, Enugwu-Out, Otuocha, Mmiata, Umuenwelum, Umuobalije, Umueze-Anam, Ifite-Anam, Umuoba-Anam, Ossomala, Ogwulikpe, Atani, Ochuche, Ohite, Odekpe, Anyamelum communities.				
5	Bauchi State	Floods on September 11, 2012	** 370	Destruction of buildings, livestock, farmlands, properties worth millions of Naira	L = 0
6	Benue State	Release of water as of September 20, 2012	* 33,000 ;	More houses submerged	L = 1
	Makurdi metropolis		** 3,189		
	Makurdi and 25 other communities in four LGAs	Rainstorm and release from the Dams on 14th September 2012	*25,000; ** 10,054	Destruction of houses, schools, worship places and farmlands washed away	L = 0
	Otukpo district of Otukpo	Rainstorm of August 24, 2012	** 300	Destruction of 60 households	L = 22

S/ No	Location of Flood	Causes in the Identified Location	No. of Affected/ Displaced Persons (IDPs)	Estimated Amount of Infrastructure/Properties lost	Estimated No. of Deaths
7	Borno State 3 LGAs (Gwoza, Askira/Uba and Hawul) of 12 communities: Tashan Alade, Ghung, Gwoza, Kwajaffa, Yelwa, Lokoja, Pelabirni, Lassa, Hambagda, Ngelleri, Bulla Waziri, and Gidan Bolo	Rainstorm of September 10, 2012	*405	Destruction of residential houses, farmlands and livestock worth N50,000,000.00	L = 3
	Cross River State Agwagune community and other wards of Biase LGA, namely: Abanyong, Erel South, Erel North, Umon North, Ikun/Etono and Agwagune/Okurike	Flood on August 29, 2012	** 2,656	Destruction of 178 houses	L = 3; I = 12
9	Delta State Sapele	Flood on July 20, 2012	** 5,000	Destruction of 100 houses, public properties, and farmlands washed away	L = 0
	Ebonyi State Ikwo, Izzi, Afikpo, North Ohozara, Onicha and Ivo LGAs: Ndiagu-Echara, Inyimagu-Ofenakpa, Igbudu-Umeh, Ekpoamaka, Enyim, Amaegu, Nnodo, Ebyia, Igbeagu, Uburu, Okposi, Akpuoha, Ozizza, Onicha, Abaomege, Ishiagu	Release of water from the Kiri in Adamawa State and from Lagdo Dams	** 6,986	Cultivated farmlands, houses, markets, schools, hospitals and worship places	L = 0
11	Gombe State Gombe metropolis	Flood on September 11, 2012		Destruction of 250 households	L = 4
	Dadin -Kowa		** 1,500	Destroyed houses, roads, culverts and farmlands washed away worth millions of Naira	L = 4
	Jigawa State 17 LGAs affected: Miga, Ringim, Dutse, Gumel, Jahun, Kiyawa, Buji, Birnin Kudu, Hadejia, Gwaran, Babura, Sule Tankarkar, Maigatari, Auyo, Kaugama, Kira Kasamma, and Birnawa.	Heavy rainfall and windstorm of August 25, 2012	** 15,718	Destroyed houses and farmlands worth millions of Naira	L = 23
13	Kaduna State Kaduna Metropolis: Rafin Guzai, Tudun wada, Fulani/Husawa road, Ugan Romi, Gona gora, Abubakar Kigo Road, Ungwar Rimi, Haliru Dantoro (Malali), Barnawa, and two communities in Jema'a LG	Rainstorm of September 14-15, 2012	*570; ** 2850	517 Houses destroyed, 1 church, 1 primary school and 2 secondary schools, farm crops washed away, submerged 1 car. Destruction worth millions of Naira.	L = 0
	Kubua and Ikara LGAs	Flood and Rainstorm June 8, 2012		Destruction of 840 houses and farmlands washed away	L = 0
	Igabi LGA	Rainstorm and dam breakage of September 3, 2012	** 1,219	Destruction of 37 houses and 79 farmlands	L = 0
	Aboro and Fadan Karshi in Sanga LGA	Flood and rainstorm of September 3, 2012	** 328		

S/ No	Location of Flood	Causes in the Identified Location	No. of Affected/ Displaced Persons (IDPs)	Estimated Amount of Infrastructure/Properties lost	Estimated No. of Deaths
14	Kano State Gabasawa, Sumaila, Bebeji, Nassarawa, Dala, Gwale, Bichi, Bagwai, and T/Wada LGAs	Flood of September 12, 2012	** 4,417		L = 18; I= 53
	Tudun-wada and Doguwa	Rainstorm and Flood July 20, 2012	** 1,049	Houses, roads and farmlands washed away	L = 0
15	Katsina State 8 Local Government Areas affected: Maiadua, Bindawa, Kusada, Batsari, Kurfi, Safana, Kankia, and Jibia.	Torrential rainfall of August 24, 2012	** 2,730	Destruction of houses, submerged farmlands	L = 0
	16	Kogi State 9 LGAs of 332 communities affected	Release of water from the dam as of September 22, 2012	*900,000; ** 5,000	Destruction of thousands of hectares of farmlands
85 communities in Lokoja, Ajaokuta, Koton Kogi, Bassa, Ofu, Ida, Igalamela, Ibaji, and Omalana LGAs		Rainfall and release of water from Kainji and Jebba Dams of September 13-15, 2012	*10,000; **5,000	Destruction of houses and farmlands washed away, properties worth millions of Naira.	L = 0
17	Lagos State Lagos	Flood on July 16, 2012	*430	Destruction of houses	Mp = 5 Mda = 200
	18	Nassarawa State 54 communities	Rainstorm	*432; ** 57	farmlands
19		Niger State Mokwa, Lavan, Edati, Borgu, Bida, Chanchaga, Shiroro, Bosso, Munya and Wushishi LGAs in 157 communities: Zdagu, Ketso, Kpashafu, Ekegi, Fangan, Tswako, yinfa, Lugura... Sugi, Dadi, Basagi, Shigaba... Wuya kanti, Tama... Fadukpe... Manta... Koro village... Koro village.. Kyari... Pompom... Jigbe... Lemu... full nos available	Prolonged torrential rainfall and the release of excess water from Kainji and Shiroro Dams	** 220	Mud houses and farmlands washed away. Losses to properties worth an estimated N250,000,000.00
	20	Oyo State Ibadan	Flood on August 2, 2012	Figures not available at the time of report	Destruction of 7 bridges and buildings
21		Plateau State 6 LGAs affected: Wase, Lantang North, Lantang South, Kanam Mikan, and Shedam (226 villages)	Torrential rainfall of August 10, 2012 that lasted thirteen hours, August 12, 2012	** 10,000	Destroyed houses and washed away bridges and farmland.
	Jos North: Rikkos, Gangare, Rukuba and Kwana Shagari villages	Flash flood of July 22, 2012	*4,583; ** 3,000	Houses and farmlands washed away worth millions of Naira	L = 37; Mp = 35
	Lantang North	Flood, Rainstorm, and Fire of July 17, 2012		Destruction of 500 houses and properties worth millions of Naira	I = 0

S/ No	Location of Flood	Causes in the Identified Location	No. of Affected/ Displaced Persons (IDPs)	Estimated Amount of Infrastructure/Properties lost	Estimated No. of Deaths
22	River State Rumuokwachi and Kaa	Flood and fire of September 10, 2012	** 2,000	Destruction of 800 houses	I = 2
	Rumuchinda community in Rumuene Obio/Akpor and Okposi and Zor and Luusue communities in Sogho, Khana LGA	Flood/Communal clash of July 11, 2012	** 471	Destruction of 107 houses	I = 3
	Ikpokiri I and II communities of Ogubolo LGA	Flood on June 1, 2012	** 500	Destruction of 100 houses	I = 0
23	Taraba State Ibbi - 30 communities and Warawa village, Wukari LGAs	Release of water from the Lagdo Dam of September 11 and 21, 2012	** 14,636	Destruction of houses, submerged places of worship, markets, cut- off bridges, schools and farmlands	I = 10
	Sardauna LGA	Flood of August 27, 2012	** 375	Destruction of houses and properties worth millions of Naira	
24	Yobe State Gashua, Bade LG Areas in Garin Lamido, Kisawa, Sabon Gari, Abuja Amare, Zango, Isari, Tundun Yan Rariya communities and Federal Low-cost housing	Hours of torrential rainfall on August 28, 2012	*3,720; ** 1,578	Destruction of houses, roads and farmlands washed away worth millions of Naira	I = 0
	Total	June, July, August and September period	*955,783; ** 157,744	Total value in Naira not yet available	L = 207; I = 71; Mp = 40 Mda = 200

NOTE:

* No. of affected persons or families reported; ** No. of displaced recorded; L = Lost lives; I = No. of injured persons; Mp = No. of missing persons; Mda = No. of missing domestic animals.

Source: NEMA, NIGERIA (Interim Report).

Date: September 25, 2012

Annex 2: Post-Disaster Needs Assessment (PDNA) Team Composition

Team Composition

High-level Management Team

Name	Designation	Contact Details (email & phone)
Alhaji Muhammad Sani Sadi	National Emergency Management Agency	(+234)09-2905777)
Ms. Marie Françoise Marie-Nelly	Country Director, World Bank	
Mr. Daouda Toure	UN Resident Coordinator	daouda.toure@undp.org , +2347064186371
Pierre Philippe	Country Delegate, EC	

PDNA Coordination Team

Name	Designation	Contact Details (email& phone)
Aliyu Baffale Sambo	NEMA	baffalesambo@yahoo.com +2348032555372
Doekle Wielinga Stephen Danyo Joseph Akpokodje	World Bank	dweilinga@worldbank.org sdanyo@worldbank.org jakpokodje@worldbank.org +2348033740948
	EC	
Janthomas Hiemstra & Rita Missal	Deputy Country Director Programmes, UNDP	janthomas.hiemstra@undp.org , +2347039264250 +2348102541772

Drafting Report Secretariat

Name	Designation	Contact Details (email and phone)
Aliyu Baffale Sambo	NEMA	baffalesambo@yahoo.com +234803255372
Doekle Wielinga	World Bank	dweilinga@worldbank.org
Roberto Jovel		rjovel@jovel.org
Asmita Tiwari		atiwari1@worldbank.org
Sajid Anwar		sanwar@worldbank.org
Stephen Danyo		sdanyo@worldbank.org
Keiko Saito		ksaito@worldbank.org
Nnaemeka Chukwuone		nnachukwuone@yahoo.com +234805124211
Joseph Ese Akpokodje		jakpokodje@worldbank.org +2348033740948
Amos Abu		aabu@worldbank.org +2348037529220
Omezikam Eze Onuoha	omezikam@yahoo.com +2348106928160	
	EC	
Seth Vordzorgbe & Hossein Kalali	UN	Seth.vordzorgbe@undp.org

Sector	UN	World Bank	GoN	NEMA
1. Housing, Land, and Settlements	Kabir Yari UN Habitat	World Bank Asha Kambon Michael D. Wong Robin Hofmeister	Min. of Lands and Housing Akasseh J.M. Vandu S. Tsakma Anene Chimezie	Arch Dimas E.S.
2. Education	UNICEF Alice Akunga Annelies Ollievz	Olatunde Adekola Irajen Appasamy	Min. of Education Sobogun O.O. Dr. Folake O. Onehi A.H. Ameh Mary A. Okoli Etolue Ihekweba O. Anyaoaku O.N.	Akiode S.A.
3. Health	WHO Dr. Irene Isibor Dr. Agriekspoon UNFPA Godwin Asuquo	World Bank Dinesh Nair Oluwole Odutolu Dr. Joe Oranuba	Min. of Health Dr. S. Belgore Dr. Fadahunsi K. Adamu S.W. Ismalia Shinkafi NARSDA Olojo Olabamiji	

Sector	UN	World Bank	GoN	NEMA
4. Water, Sanitation, and Hygiene	UNICEF Kannan Nadar Bade Olokun	World Bank Hassan Kida Masood Ahmad	Min. of Water Resources Edu Folorunso A. Obuzor V.N. Allahyafi M. Daniel Mbama Charles NISHA Rev. M.I. Nwabufo Bashir Sulaiman Fashe Francisca Kunsuk P.T. Bisong J.B. Engr Amodu D. Usoroh A.U.	
5. Agriculture, Fisheries and Livestock	Ms. Louise Sethswade FAO	World Bank Sheu Salau	Min. of Agriculture and Natural Resources Oshadiya O.O. Babatunde J.O. NARSDA Abdulkareem Isa	Fred Anusim Abbani I. Garki
6. Livelihoods and Employment	ILO Antonio Cruciani Prof. Olaseni B. Chinyere Emeka Dennis	World Bank	Min. of Labor Murna Joy Loma Joseph Akpan Frank Uko D. Yunusa Abdul Archibong C.D. Aprezi A.C. Imeh Rhoda O.	
7. Trade and Industries	UNIDO Alh. Mustapha	World Bank Richard Sandall	Min. of Trade & Investment Hassan Usman Nkem Anucha National Planning Lanre Adekanye	
8. Energy		World Bank Ereno Edouard Erik Fernstrom	Min. of Power Engr. Abel Philip Shanu R.A. Metu C. Francis PHCN Abdulkareem A. National Planning Comm. Ochepa Thomas National Pop. Comm. Moses C. John	

Sector	UN	World Bank	GoN	NEMA
9. Irrigation		World Bank Lucas Akapa	Min. of Water Resources	
10. Transport		World Bank Olatunji Ahmed Mohammed Aliyu	Min. of Works Engr. Onokpasa Chidawa Paul A. Engr. Usman Y. Osuji U. G. Engr. Edmond	
11. Telecommunications		World Bank	Min. of Info & Comm.	
12. Governance & Public Infrastructure	David Andrew UNDP	World Bank Ikechukwu Nweje Jens Kristensen	Min. of Works	TBC
13. Disaster Risk Reduction	Macdonald & Matthew Alao Prof. E.O Igusi Kemi Kuponu Katrin Schweppe WMO Datius R.	World Bank Asmita Tiwari	GoN – NEMA NIMET Wilson S.M	As stand-alone and cross-cutting sector Musa Abdulrazaq Raji Adejoke Ufondu Mercy Aro-Lambo A. Nwite-eze A. Shafiu Sidi
14. Environment	Muyiwa Odele UNDP	World Bank Amos Abu Joseph Ese Akpokodje	Min. of Environment Hanson Ifiok Kopada M.A Labaran Musa Jegede G.B. Dr. Mrs. Oyeleke Bankole Babalola NOSDRA Ayodele Folusho Engr Igwe C.O. Ani Ifeoma	As stand-alone and cross-cutting sector
15. Gender	Desmond Osemhenje UN WOMEN Gloria Eneuze UNFPA	Dr. Asha Kambon Adora Ikenze Caroline Sage	Min. of Women Affairs Onwukwe Nkechi Adamu S.W. Mrs Bulus F.K. Samalia Adamu	Aminu Saleh cutting sector
16. Social Protection	UNHCR			As a cross-cutting sector
17. Macro economics		Gloria Joseph-Raji Babalola Yinka	Nwokedi Ngozi Obasi Philp Eme Dada Tochukwu N.	

Each sector team was led by GoN officials from line ministries and representatives from the World Bank and UN agencies.

Annex 3: Agenda for Nigeria 2012 Floods Post-Disaster Needs Assessment Orientation and Training, November 5–7, 2012

DAY 1	Topic	Description	Facilitator
8:30 – 9:00	Registration		
9:00 – 10:00	Opening remarks Disaster background Scope and objectives of the assessment		NEMA
10:00 – 10:15	Break		
10:15 – 1:00	Introductory remarks		WB, UN, EC Government ministries and agencies
1:00 – 2:00	Lunch		
2:00 – 3:00	Introduction to PDNA and case studies	Define scope and objectives of the PDNA, including sectors and implications for recovery and reconstruction planning Clarify roles of WB, UN, Government staff, and other partners Examples and case studies	Asmita Tiwari (WB)
3:00 – 4:00	Conceptual framework of the PDNA 1. Damage and Loss Assessment Methodology (DaLA) 2. Human Recovery Needs Assessment methodology (HRNA)	Definitions and concepts of the damage and loss assessment methodology, with practical application examples Outline of standard procedures for conducting assessments	Sajid Anwar (WB) Rita Missal (UN)
4:00 – 4:15	Break		
4:15 – 4:45	Generic assessment procedure	Overview of general assessment procedure	Rami Quttaineh WB
4:45 – 5:00	Wrap up and question & answer session	Q&A	Sajid Anwar (WB)
DAY 2	Topic	Description	Facilitator
8:30 – 9:00	Registration		
9:00 – 10:30	Baseline data requirements	Presentation and brief discussion of procedures and examples of sector data requirements	Sajid Anwar (WB)
	Damage data collection	Presentation on types of damage, extent of damage, and creating standard definitions by sector	Sajid Anwar (WB)
	Other data collection tools and issues	Setting up and conducting field questionnaires, collecting data, data management, and logistics for data sharing	Sajid Anwar (WB)
10:30 – 10:45	Break		
10:45 – 12:00	Exercise: Baseline data, sources for data collection and management		Sajid Anwar (WB)
12:00 – 1:00	Lunch		

DAY 2	Topic	Description	Facilitator
1:00 – 2:00	Conducting the sectoral assessments	Introduction to sectoral assessment: an overview	Asmita Tiwari (WB)
2:00 – 3:30	Disaster Risk Reduction Sector assessment Governance sector assessment	Overview of the key issues assessed in the sector	Rita Missal (UN)
3:30 – 3:45	Break		
3:45 – 4:30	Health sector assessment Education sector assessment Housing sector assessment	Overview of the key issues assessed in the sector	Asmita Tiwari (WB)
DAY 3	Topic	Description	Facilitator
8:30 – 9:00	Registration		
9:00 – 10:00	Conducting the assessment Productive Sectors	Sector-by-sector overview of typical damages and losses, short exercises on determination of damages and losses	Sajid Anwar (WB)
10:00 – 10:45	Conducting the assessment Cross-cutting sectors	An overview of gender issues	Abimbola Oyelohunnu (UN)
10:45 – 12:00	Recovery Framework: an overview	Key issues to be considered in planning Recovery and Reconstruction Framework	Doekle Wielinga (WB) Rita Missal (UN)
12:30 – 1:30	Lunch		
1:30 – 2:30	Risk Mitigation	Approaches to flood management and mitigation	Asmita Tiwari (WB)
2:30 – 3:15	Presentation of report of the Rapid assessment		UN OCHA
2:30 – 3:30	Sector Group work	Sector team group work for finalizing damage collection data sheets	Sectoral Experts
3:30 – 3:45	Break		
3:45 – 4:15	Report writing and sector analysis General process and outline Key issues to include Summary report		Doekle Wielinga (WB) Rita Missal (UN)
4:15 – 4:30	Concluding discussion and next steps		NEMA

Agenda for Nigeria 2012 Floods Post-Disaster Needs Assessment: Sectoral Assessment Training November 13, 2012

DAY 1	Topic	Description	Facilitator
10:00-10:15	Registration		
10:15-10:30	Welcome remarks Scope and objectives of the assessment		NEMA , WB
10:30-11:00	Overview of the Conceptual Framework of the PDNA – the Human Recovery Needs Assessment Methodology (HRNA)	Definitions and concepts of the damage and loss Human Recovery Needs Assessment methodology, with practical application examples	UNDP
11:00 -11:15	Questions and clarifications		
11:15 – 12:30	Overview of the Conceptual framework of the PDNA/ Generic Assessment procedure: The Damage and Loss Assessment (DaLA) methodology	Definitions and concepts of the DaLA methodology, with practical application examples	Roberto Jovel, World Bank
12:30 – 1:00	Questions and clarifications		
1:00 – 2:00pm	Lunch		
2:00 – 3:30	Group Work – Sectoral Teams	Opportunity for Sector Teams to clarify data requirements for assessment	Roberto Jovel, Asha Kambon, Rami Quttaineh, WB
3:30 – 4:00pm	Plenary to finalize logistics for Field Visits		NEMA,WB, UNDP

Annex 4: List of Participants

NEMA/World Bank Orientation Training On Post-Disaster Needs Assessment

(Day 1) November 5, 2012

S/No	Name	Designation	Organization	Phone number	E-mail Address
1.	Nwachukwu Henry A.	Director of Agriculture Abia state.	Ministry of Agric. Abia state	08036298700	akijnobi@yahoo.com
2.	Daniel I. Moze	Rehabilitation officer	Benue SEMA	08064612328	dimnesunds@gmail.com
3.	Sammuel B. Arokoji	Director CDRMS Uniport	UniPort	08033412733	Samarokaju@yahoo.com
4.	Alao Mattew	DRR Officer	UNDP	08096095983	mato_@yahoo.com
5.	Kabir M.Yari	Program manager	UN Habitat	08033141100	kabir.yari@undp.org
6.	Abdulsalam M.B.	Coordinator	NEMA NC JOS	07067477772	salambib001@yahoo.com
7.	Bldr. Garba Musa	DDPB	BASG	08034367917	gmusa83@yahoo.co.uk
8.	Umaru A. Gwamna	PM	MANR (REP)	08069213186	usgwamna@yahoo.com
9.	Tunde Wale Temowo	SNR. Associate	KPMG	08025011432	twale-temowo@kping.com
10.	James Ker	Prog. Manager	Benue ADP	07039049128	bnarda89@yahoo.com
11.	Uche Ezeonyesi	Es. SEMA	Imo state	08033218992	ezeonyesiuche@yahoo.com
12.	Vandu Stephen Tsakma	Deputy Director	National Population Commission	08036305881	vs_tsakma yahoo.com
13.	Engr. E.ONI	Director planning R&S	Min. of Works, Benin city	08035706361	
14.	Dr. M. Arene	Director Epieml. project	Ministry of Health	08065488809	aree_kouv@yahoo.com
15.	Prof E.O.Igusi	Director CDRMS	ABU Zaira	08037037516	ediguisi yahoo.com
16.	Bintan S. Wuyep	DRR	SEMA-Plateau	08066387314	bwuyep@yahoo.com
17.	Akinbola H.G.	DFA	NEMA	08053271850	higzole@yahoo.com
18.	Bade Olokun	WASH specialist	UNICIEF	08034020878	aolokun@unicief.org
19.	Alhaji Mustapha	UNIDO	UNIDO	08030644817	almus_2@yahoo.com
20.	Frank Uko Daniel	AG AD(SC)	FMLSP	08062848011	frankuko@yahoo.com
21.	Sajid Anwar	DRM	World Bank		sanwar@worldbank.org
22.	Rami Quttaineh	DRM	World Bank		rquuttaineh@worldbank.org
23.	Dr. J. Giwa Amu	Educ. officer	UNICIEF Abuja	08033149205	jgiwaamu@unicief.org
24.	Mr. Dele Olatunji	Consultant	JICA	08037871140	olatunjawaheed.y@jico.go.jp
25.	Mr. Igbinosun Emmanuel	Chief Lab Officer Min. of Labor & Productivity	MOL&P	07034054991	emanox@yahoo.com
26.	Mrs. Nwittize	SDRRO	NEMA	08024237054	nwittize@yahoo.com

S/No	Name	Designation	Organization	Phone number	E-mail Address
27.	Andrew D. Adejo	Prog. Analyst	UNDP	08033900599	aderjoandrew@yahoo.com
28.	Rita Missal	Recovery	UNDP		ritamissal@undp.org
29.	Odele M.O.	TLM/Environment	UNDP	0802336263	reachodele@yahoo.com
30.	Prof. A.M.Jinadu	Director	FUT Minna	08034052367	jinaduolaoti@yahoo.com
31.	Comrade Musa Toly	DEP president	TUC	08036025424	Musa_toly@yahoo.co.uk
32.	Joseph A. Daudu	Director Prod.	Min. of Agric. Niger state	08083123026	Josephdandu62@yahoo.com
33.	Aliyu Ibrahim	ES SEMA	Jigawa state	08066053679	Aliyugmelg77@gmail.com
34.	Alh. Bappah Azare	Hon. comm.	Bauchi state	08036089361	bappaha_azare@yahoo.com
35.	Amama S. A.	DRRO1	NEMA	08039452007	ask4amamasunny@yahoo.com
36.	Engr I. B.Okeke	DD(M/ES)	Min. of works Anambra state	08063803209	okeke_kema25@yahoo.com
37.	Mahmaid A. Garba	Perm. sec.	SEMA BAUCHI	08036110748	muhamaid_gawoi@yahoo.com
38.	Dr. Kingsley C. Ogboi	Director	Nsukka UNN DRM&DS	08034032643	boi.ogboi@gmail.com
39.	Abdullahi Saleh Dokaji	Director	Min. for Local Government	08066212717	
40.	Olanrewaju Kazeem Akinade	SDRRO	NEMA	08063141170	kazoalhaji01@yahoo.com
41.	Aikpokpo Ebahi O.	SDRRO	NEMA	08023164891	nemalagos@yahoo.com
42.	Obolo Funmilayo	SPO GIS	NEMA	08138333124	funmob@yahoo.com
43.	Ogundu Chidiebere	SDRRO	NEMA	08036751222	chidiogundu@yahoo.com
44.	Eric Ebhodaghe	PDRRO	S/S NEMA	08133370856	ericisi@rocketmail.com
45.	Umar Gambo	PAS 1	NEMA	08176195033	
46.	Enwo Nnachi N.	DD INFO	SEMA	07032983885	nnachinnachi@yahoo.com
47.	Ongele D. L.	D.Agric.	Ministry of Agriculture Ebonyi State	08077472395	ongelehpnton@yahoo.com
48.	Medugu John Sunday	Director	Ministry of Agric. Lokoja	08166000412	medugujohn@yahoo.com
49.	Victor Nwaubahi	PPO	NEMA	08033180741	vugo1@yahoo.com
50.	Musa Ilallah	Zonal Coordinator N/west	NEMA	08033146397	musahk123@yahoo.com
51.	Akude Sao	ACTO	NEMA	08037195633	saoakeode@yahoo.co.uk

S/No	Name	Designation	Organization	Phone number	E-mail Address
52.	Afolayan O. A.	PPO	NEMA	07065990518	segsmart2000@yahoo.com
53.	Dr Abdullah I. E.	E/S	SEMA/Nasarawa	08037022808	dr.abdullahiidris@yahoo.com
54.	Aliyu Suleiman	Director	Bauchi State	08033941616	aluysulamam24@yahoo.com
55.	Hammed S. Abdul	Director	SEMA Kogi State	08078372025	seguabdulhammed@yahoo.com
56.	Izuakor Vivian I.	LEGAL	NEMA	08037785801	duchess4u67@yahoo.com
57.	Azumu C. Aprezi	FML&P/CLOFML&P		08023592878	zumyzume8@yahoo.com
58.	Dennis Zulo	Deputy Director	ILO	08031981185	zulu@ilo.org
59.	Chinyere Emeka Anuna	Pro Officer	ILO	08075066557	emeka.anuna@ilo.org
60.	Damachi Joyce	Fed. Min. of Labor & Productivity	FML&P	08028674944	happyjoyce4life@yahoo.com
61.	Danladi I.Umann	Director	NASEMA	08065326696	
62.	Amina Saleh	SDRRO	NEMA	08188808333	mina3015@aol.com
63.	Shafiu Sidi	DRRO	NEMA	08032422022	shafiu102@yahoo.com
64.	Simon Katu	SDRRO	NEMA	08067796177	pofizmail@yahoo.com
65.	Anusim Manfred	PDRRO	NEMA	08038476809	iykemanus@yahoo.com
66.	Dr. U. M. Maryah	Director CDRM&DS Uni. Maid	Uni. of Maiduguri	08022522878	maryahuman@yahoo.com
67.	Dr. Badrul Haque	Sr.Ops. Officer	World Bank		bhaque@worldbank.org
68.	Dr. Amos Abu	Snr. Env. Specialist	World Bank	08037529220	aabu@worldbank.org
69.	Asmita Tiwari	DRM Specialist	World Bank		atiwari1@worldbank.org
70.	Daniel E. Obot	AD (CR & R)	NEMA	08036124213	danielobot16@yahoo.com
71.	Joseph Akpokodje	Snr. Env. Specialist	World Bank	08033740948	jakpokodje@worldbank.org
72.	Efeuko John Onah	NYSC	NEMA	08065123532	deejaystone@yahoo.com
73.	Abbani Imam Garki	PDRRO	NEMA	08065123532	abbanii@yahoo.com
74.	Engr. Chris Omera	DDCE	Min. of Works Lokoja	07063663355	chisekele@yahoo.com
75.	R. C. Anyanw (Mrs.)	CPO	Nat. Planning Comm.	08039739095	anyonurahb@yahoo.com
76.	Aisha Abbas	DPR&NDM	SEMA KADUNA	08034724566	
77.	Ufondu Mercy E.	DRR	NEMA	08036878172	mercydamsel2009@yahoo.com
78.	Ishaya Isah Chonoko	CDRRO	NEMA	08030606130	chonokoi@yahoo.com

S/No	Name	Designation	Organization	Phone number	E-mail Address
79.	Ula Mala	Medical Officer	WHO		malap@who.int
80.	Aro-Lambo Amina	DRR	NEMA	08054449998	amilycious@yahoo.com
81.	Cephas Ityonzughul	NPO	WHO	08037009963	ityonzughulc.ng.afro.who.int
82.	Philomena D. Allu	PEO	Min. of Works & Transport Nasarawa	08069172206	
83.	Yoshiro Masvda	PEP	JICA	07059835350	masoda.yashiro@jiko.go.jp
84.	Dr. I. Isbir	NSO	WHO	08023019104	
85.	Engr. Abuba Kabir	ES	SEMA, KANO	08036359068	abubakarjibiril21@yahoo.com
86.	Sani Datt I.	IO	NEMA	08036106972	sandalti@yahoo.com
87.	Oparachukwu G.	EO	NEMA	08035968876	gerald.oparachukwu@yahoo.com
88.	Mrs. O. A. Awodiyi	PNO	FMOH	08033504742	funmilola6707@yahoo.com
89.	Shehu Suleiman			08033628760	sollypee@yahoo.com
90.	Engr. Imoni Samson	Civil Engineer	MOW&T, Makurdi	08039737428	imonisam@yahoo.com
91.	Keghku, S. Atsem	SSA	BLGCA Benue	07036064434	keghkmea@yahoo.com
92.	Engr. Gambo S. Malan	DCE	Min. of Works & Transport Duste	08036266992	gbaraujarae@yahoo.com
93.	Lanre Adekanye	AD	National Planning Commission	08033200204	ladekanye@yahoo.com
94.	Osemhenjie D. O.	PO	UN Women	08032355584	osalobo.osemhenjil@unwomen.org
95.	Achi A.K.	Executive Secretary	SEMA	08037417572	adakachi4u@yahoo.com
96.	Ajiboye Olatunde J.	PPO (GIS)	NEMA	08066416076	tundenemagis@yahoo.com
97.	Dimas Edward Skari	ACDRRO	NEMA	08035398956	dewardsk@gmail.com
98.	Sadiq M. Awwal	PO	NEMA	08054041207	smawwal05@yahoo.com
99.	Aliyu B.Sambo	DD/DRR	NEMA	08032555372	baffalesambo@yahoo.com
100.	Anusim Jennifer C.	Search & Rescue	NEMA	08034284586	ibe_jennifer@yahoo.com
101.	Engr. D. E. Okwuora	DD (Civil)	Ministry of Works Imo State	08033273806	domokwue@yahoo.com
102.	Onuoha Omezikam Eze	Consultant	World Bank	08106928160	omezikam@yahoo.com
103.	Roberto Jovel		World Bank		rjovel@jovel.org

NEMA/World Bank Orientation Training On Post-Disaster Needs Assessment**(Day 2) November 6, 2012**

S/ No	Name	Designation	Organization	Phone number	Email Address
1.	Engr D. E. Okwuora	DD civil	Ministry of Works Imo state	08033273806	domokwu@yahoo.com
2.	Jennifer C. Anusim	Saro	NEMA	08034284586	ibe_jenny@yahoo.com
3.	Mohammed Ahmed	Dir. Planning	NSEMA Niger state	08054470197	ijagbagyi@yahoo.com
4.	Mahamoud A. Garba	Perm. sec.	SEMA Bauchi state	08036110748	mahmoudgarba01@yahoo.com
5.	Bldr. Garba Musa	DDPB	MOW& T Bauchi state	08034367917	gmusa83@yahoo.com
6.	Bar Paul Daniel Gyang	DLGI	Min. for LG&CA Plateau state	08035906832	
7.	Dr. Justin Nwabufoljezie	Executive Director	SEMA Anambra state	08037424242	ijezieconsultants@yahoo.com
8.	Avm Gabriel Abdul	S.A. disaster Management	Kogi state	08059175527	gababd@yahoo.com
9.	Odiyo H. O. (Mrs)	Dir. Environment	Min. of Enviroment Kogi state	08036538845	onyihann@yahoo.com
10.	Umar Gambo	PAS 1	Min. Agric. Jigawa state	08176195033	
11.	Engr I. B. Okeke	DD (M/ES)	Min. of Works Anambra state	08063803209	
12.	Aliyu Ibrahim	ES	SEMA Jigawa state	08066053679	aliyugumel977@gmail.com
13.	Ogundu Chidiebere	SDRRO	NEMA Enugu	08036751222	chidiogundu@yahoo.com
14.	Anusim Manfred I.	PDRRO	NEMA HQRTS	08038476809	iykemanus@yahoo.com
15.	Aliyu Suleiman	Director	SEMA Bauchi	08033941616	aliyusuleiman24@yahoo.com
16.	Enwo Nnashi N.	DD, info	SEMA Ebonyi state	07032983885	nnachinnachi@yahoo.com
17.	Ongele D. I.	D. Agric.	Min. of Agric. Ebonyi state	08077472395	ongelelyaton@yahoo.com
18.	Dr. Um Maryah	Director CDRM&DS	University Maiduguri	08022522878	maryahumar@yahoo.com
19.	Musa Ilallah	Zcnw	NEMA	08033146397	musahk123@yahoo.com
20.	Sadiqmuhid Anwal	PO	NEMA	08054041207	smawwal05@yahoo.com
21.	Medugu John Sunday	Director	Ministry of Agric. Lokoja	08166000412	medugujohn@yahoo.co.uk
22.	Dimas E.sSkari	ACDRR	NEMA	08035398956	dewardsk@gmail.com
23.	Victor Nwaubani	PPO	NEMA	0803318024	vngo@yahoo.com
24.	Obolo Fumilayo	SPOGIS	NEMA	08138222124	funmob@yahoo.com
25.	Tunde Ajiboye	PPO(GIS)	NEMA	08066416076	tundenemagis@yahoo.com
26.	Engr. Imoni Samson	Civil Engr.	MOW&TMarkurdi	08039737428	imonisam@yahoo.com
27.	Prof. Samuel Arokoyu	Dir. CDRMDS	UNIPORT	08033412733	samarokoyu@yahoo.com

S/ No	Name	Designation	Organization	Phone number	Email Address
28.	Joseph A. Daudu	Dir. Prod.	Min. Agric. Minna	08083123026	Josephdaudu62@yahoo.com
29.	Umaru A. Gwamana	PM	REP-MANR	08069213106	umagromna@yahoo.com
30.	Hammed S. Abdul	Director	SEMA	08078373825	hassanhamed788@yahoo.com
31.	Com. Musa Toly	Deputy President	TUC Lagos	08036025424	musa.toly@yahoo.com
32.	Mrs. A. Nwittieze	SDDRO	NEMA	08024237054	nwittieze@yahoo.com
33.	Engr. Gambo S. Malan	DCE	MOW&T Dutse	08036266992	gbaraujara@yahoo.com
34.	Ebhodaghe I. Eric	PDDRO	S/S NEMA	08133370856	ericisi@rockectmail.com
35.	Vandu Stephen Tsakma	DD	National Population Commission	08036305881	vs_tsakma@yahoo.com
36.	Frank Uko Daniel	AG AD(Agric.)	FMC&P	08062848011	frankuko@yahoo.com
37.	Mrs. O. A. Awodiji	PNO	FMOH	08033504742	fumilola67072yahoo.com
38.	Nwachukwu Henry	Director of Agric.	MOA Abiastate	08036298700	akijuobi@yahoo.com
39.	Simon Katu	SDRRO	NEMA N/W	08067796177	pofizmail@yahoo.com
40.	Jonathan Ndezi	Humanitarian Specialist	UNFPA		ndzi@fpa.org
41.	Abbani Imam Garki	PDRRO	NEMA HQ	08065123532	abbani@yahoo.com
42.	Obot Daniel Etim	ADCR&R	NEMA HQ	08036124213	danielobot16@yahoo.com
43.	Alhaji Musatapha	Nat. Expert	UNIDO	08030644817	almus_2@yahoo.com
44.	Aro-lambo Amina	DRR	NEMA HQ	08054449998	amilycious@yahoo.com
45.	James Keri	Prog. Manager	BNARDA	07039049128	bnarda89@yahoo.com
46.	Engr. E.Oni	Dir. PR&S	Edo state Min. of Works Benin city	08035706361	
47.	Aikpokpo Ebanu O.	SDRRO	NEMA SW	08023164891	nemalagos@yahoo.com
48.	Achi A. K.	Ex. Sec.	SEMAAbia	08037417572	adakachi4u@yahoo.com
49.	Olanrewaju Kazeem	SDRRO	NEMA NC	08063141170	kazoalhazi01@yahoo.com
50.	Alh Bappah Azare	Bauchi state	Ms Duties	08036089361	bappahazara@yahoo.com
51.	Moze Daniel	Rehabilitation officer	SEMA Markurdi	08064612328	dimnesunds@gmail.com
52.	Ufondu Mercy	DRR	NEMA HQ	08036878172	mercydamsel2009@yahoo.com
53.	Philomena D. Allu	Principal officer	Nasarawa state MOW&T	08069172206	
54.	Keghku E. Atsem	SSA	BLGCA Benue	07036564434	keghkuea@yahoo.com
55.	Afolayan O	PPO	NEMA	070685990518	segessmart200@yahoo.com
57.	Mbama Charles	PA D(WQC &S)	FMWR	08034606065	charlyzbomma@yahoo.com
58.	Amama S. A.	DRRO1	NEMA	08039452007	ask4amamasunday@yahoo.com
59.	Hon. James G. Dugo	Commissoner	Ministry of L.G& Land	08037771970	jamesdugo@yahoo.com

S/ No	Name	Designation	Organization	Phone number	Email Address
60.	Emmanuel Igbinosun	CLO	Min. of Labour Abuja	07034054991	emanox@yahoo.com
61.	Chukwu A. Uju	PAO	Min of finance	08058913001	chukwuanthoniauju@yahoo.com
62.	Tochi O. Odele	Prog. Analyst	UNFPA	08073893000	odele@unfpa.org
63.	Alao Matthew	DRR Officer	UNDP	08096095983	malo_ao@Yahoo.com
64.	Aliyu B. Sambo	DRR	NEMA	08032555372	baffalesambo@yahoo.com
65.	Bintan S. Wuyer	DRR	SEMA Plateau	08066387314	bwuyel@yahoo.com
66.	Damachi Joyce	ACLO	FML &P	08028674944	happyjoyce4life@yahoo.com
67.	Aprezi Azume C.	CLO	FML &P	08023592878	zumyzum08@yahoo.com
68.	Engr. Chris Omera	DDCE	Min. of Works Kogi	07063663335	chrsekele@yahoo.com
69.	Uche Ezeonyeasi	ES SEMA	SEMA Imo	08033218992	ezeonyeasiuche@yahoo.com
70.	Abimbola Oyelohunnu	Prog Officer	UN Women	08037009185	bimbo.oyelohunnu@unwomen.org
71.	Suleiman Shehu			08033628760	sollypee@yahoo.com
72.	Aisha Abbas	DPR &NDM	Kaduna State SEMA	08034724566	
73.	Abdullahi S. Dokaji	Director Social	Jigawa Min. for LG	08066212717	
74.	Abdulsalam M. B.	Coordinator	NEMA-NC Jos	07067477772	salambib001@yahoo.com
75.	Akeode SAO	ACTO	NEMA	08037195653	saodked@yahoo.com
76.	Imoka U. L.	Program Manager ADP	ADP/Min. of Agriculture Anambra State	08033724066	Leouzo2009@yahoo.com
77.	Amina Saleh	SDRRO	NEMA Abuja	08188808333	mina3015@aol.com
78.	Eteuko John Onah	CORPER	NEMA Abuja	07032901916	deejaystone@yahoo.com
79.	C. L. Okpalake	Assistant Director	Federal Min. of Water Resources	08052529600	christainokpaleke@yahoo.com
80.	Engr. Yohanna Waje	Deputy Director	Ministry of Works & Transport Kaduna	08036186086	dadyeey@gmail.com
81.	Bade O. Colin	WASH Specialist	UNICEF	08034020878	aolkah@unicef.org
82.	R. C. Anyanwu Mrs.	CPO	National Planning Commission	08039739095	anyanwurahab@yahoo.com
83.	Hassan Usman	Admin. Officer	Federal Ministry of Transport	08029046661	hassanugwandu@yahoo.com
84.	Nkem Anuchi	Senior Executive	Federal Ministry of Transport	08025594031	
85.	O. Adelekan	Head of Department	University of Ibadan	08023470003	ibiadelekan@yahoo.com
86.	Saratu A. Yunusa	Education Specialist	UNICEF	08035350956	syunusa@unicef.org
87.	Stephen Ibem	Ministry of Agriculture	Ministry of Agriculture	08069250205	steveibam@yahoo.com
88.	Umoh S. George	ACS	NBS	08023846648	sungmoh@yahoo.com
89.	Onuoha Omezikam Eze	Consultant	World Bank	08106928160	omezikam@yahoo.com
90.	Asma T. Ibrahim	CSO, Head Climate Change & Modelling Division	NASRDA ABUJA	08062950591	asmabbfarouk2002@gmail.com

S/ No	Name	Designation	Organization	Phone number	Email Address
91.	Shafiu Sidi	DRRO	NEMA Abuja	08032422022	shafiu102@yahoo.com
92.	Andrew D. Adyo	Analyst	UNIIDP	08033900599	adyoandw@yahoo.com
93.	R. A. Shanu	PTO1	Ministry of power	08033809853	adeshinashanu@yahoo.com
94.	Young Julie	PS SEMA	SEMA	08034016121	julieyoung15@gmail.com
95.	Fidel Okafor	Special Adviser	Ministry of Local Government Anambra State	08036708603	fidelokah@yahoo.com
96.	Izuakor Vivian I.	Legal	NEMA Abuja	08037785801	duchess4u67@yahoo.com
97.	Hon. James Dugo	Comm. Ministry of Local Gov. Bayelsa	Comm. Ministry of Local Gov. Bayelsa	08037771970	jamesdugo@yahoo.com
98.	Prof E. O. Iguisi	Director CDRMS	CDRMDS ABU	08037037516	ediguisi@yahoo.com
99.	Prof. A. M. Jinadu	Director CDRMS	FUT Minna	08034052367	jinaduolaoti@yahoo.com
100.	Dr. Abdullahi I. E.	ES	SEMA Nasarawa	08037022808	dr.abdullahidris@yahoo.com
101.	Andrew David Adejo	Prog. Analyst	UNDP	08033900599	aderjoandrew@yahoo.com
102.	J. A. Kehinde	DD(HER/DM)	FMOH	08023210923	akonjkindinde@yahoo.com
103.	James Eno West	Director	Min. of LGA Cross River	08032736729	jamesuket@yahoo.com
104.	Judith Giwa Anu	EO	UNICEF	08033149205	
105.	Rami Quttaineh	DRM	World Bank		rquuttaineh@worldbank.com
106.	Sajid Anwar	Management Specialist DRM	World Bank		sanwar@worldbank.com
107.	Asmita Tiwari	Disaster Risk	World Bank		
108.	Joseph Akpokodje	Snr.Environmental Specialist	World Bank	08033740948	jakpokodje@worldbank.org
109.	Engr. Tan A.Diriyayi	Assistant Director	Min. of Works Yenagoa	08036727868	
110.	Lanre Adekanye	Assistant Director	National Planning Commission	08033200204	ladekanye@yahoo.com
111.	Roberto Jovel		World Bank		rjovel@jovel.org

NEMA/World Bank Orientation Training on Post-Disaster Needs Assessment

(Day 3) November 7, 2012

S/ No	Names	Designation	Organization	Phone number	E-mail address
1.	Rami Quttaineh	DRM	World Bank		rquuttaineh@worldbank.org
2.	Ianthoman Huemstna	DCOP	UNDP		
3.	Rita Missal	Recovery	UNDP		rita.missal@undp.org
4.	Sajid Anwar	DRM	World Bank		sanwar@worldbank.org
5.	Joseph Akpokodje	Snr.Environmental Specialist	World Bank	08033740948	jakpokodje@worldbank.org
6.	Aliyu B. Sambo	DD/DRR	NEMA	08032555372	baffalesambo@yahoo.com
7.	Ibidun Adelekan	Director CDRMS	University of Ibadan	08023470003	ibiadelekan@yahoo.com
8.	Prof. Samuel B. Arokoyu	Director CDRMDS	Uniport	08033412733	samarokoyu@yahoo.com
9.	Aliyu Suleiman	Director	SEMA, Bauchi	08033941616	aliyusuleiman24@yahoo.com
10.	Bldr. Garba Musa	DDPM	Min. of Works & Transport Bauchi	08034367917	gmusa83@yahoo.com
11.	Aikpokpo Ebahi	SDRRO	NEMA S/W Lagos	08023164891	nemalagos@yahoo.com
12.	Achi, A. K.	EX SEC	SEMA ABIA	08037417572	adacaclou4@yahoo.com
13.	Engr. Chris Omera	DDCE	Min. of Works Kogi	07063663335	chirseklu@yahoo.com
14.	Moze Daniel I.	Rehabilitation officer	SEMA Benue	08064612328	dimnesunds@gmail.com
15.	Engr. Yohanna Waje	DDCE	Min. of Works & Transport	08036186086	dadyey@gmail.com
16.	Mohammed Ahmed	D/Planning	SEMA Niger	08054470197	ijagbagyi@yahoo.com
17.	Engr. Gambo S. Malan	DCE	MOW & T Duste	08036266992	gbaraujara@yahoo.com
18.	Fidel Okafor	Special Adviser	Anambra state Min. of Local Govt.	08036708603	fidelokah@yahoo.com
19.	Alao Matthew	DRR Officer	UNDP	08096095983	malo_a@yahoo.com
20.	Umar Gambo	PAS1	Min. of Agric. Jigawa	08176195033	
21.	Ebhodaghe I. Eric	PDRRO	S/S NEMA	08133370856	ericisi@rocketmail.com
22.	Prof A. M. Jinadu	Director	FUT Minna	08034052367	jinaduolaoti@yahoo.com
23.	Engr. I. B. Okeke	DD (M/E)	Min. of Works Anambra state	08063803209	
24.	Mohamoud A. Garba	Perm. Sec.	SEMA Bauchi	08036110748	mahmoudgaraba01@yahoo.com
25.	Uche Ezeonyeasi	ES SEMA	SEMA Imo	08033218992	ezeonyeasiuche@yahoo.com
26.	Umoh S. George	ACS	NBS Abuja	08023846648	sungmoh@yahoo.com
27.	Engr. Imoni Samson	Civil Engr.	Min. of Works & Transport Makurdi	08039737428	imonisam@yahoo.com
28.	Musa Ilallah	NW –ZC	NEMA	08033146397	musahik123@yahoo.com
29.	Imoka U. L.	Program Manager ADP	ADP/Min. of Agric. Anambra	08033724066	leouzo2009@yahoo.com
30.	Dr. V. M. Maryah	Director CDRM & DS	Uni. Of Maiduguri	08022522878	maryahumar@yahoo.com
31.	Bintan S. Wnyep	DRR	SEMA Plateau	08066387314	bwwwyep@yahoo.com

S/ No	Names	Designation	Organization	Phone number	E-mail address
32.	Dr. Justin Nwabufo Ijezie	Executive Director	SEMA Anambra	08037424242	ijezieconsultants@yahoo.com
33.	Shehu Suleiman			08033628760	sollypee@yahoo.com
34.	Damachi Joyce	ACCO	FML &P	08028674944	happjoyce4life@yahoo.com
35.	Abbani Imam Garki	PDRRO	NEMA HQ	08065123532	abbanii@yahoo.com
36.	Hassan Usman Gwandu	Admin Officer	Federal Ministry of Trade	08029046661	hassanogwandu@yahoo.com
37.	Shadrach Daniel Barub	ES (AD SEMA)	AD SEMA Yola	07039439926	adsemayola@yahoo.com
38.	Vandu Stephen Tsahma	DD	National Population Commission Abuja	08036305881	Js_tsahma@yahoo.com
39.	Ufondu Mercy	DRR	NEMA HQ	08036878172	mercydamself2009@yahoo.com
40.	Jennifer C. Ibe	SARO	NEMA HQ	08034284586	ibe_jenny@yahoo.com
41.	Enwo Nnachi N.	DD INFO SEMA	SEMA Ebonyi	07032983885	nnachinnachi@yahoo.com
42.	Saidu M. Bello	Sec. Min. of Works Yola	Sec. Min. of Works Yola	07067304588	
43.	Arc. Sunday S. G.	Min. of Works Jalingo	Min. of Works Jalingo	08065302877	
44.	Odiyo H. O. (Mrs)	Director Environment	Kogi state Min. of Environment	08036538845	onyihann@yahoo.com
45.	Joseph A. Dauda	Director Prod.	Min. of Agric. Niger State	08083123026	juhuskarma@gmail.com
46.	James Ker	Prog. Mgr.	BNARDA	07039049128	bnarda89@yahoo.com
47.	Alhaji Mustapha	National Expert	UNIDO	08030644817	almus_2@yahoo.com
48.	Akasseh J. Mathias	Estate Officer	FMLH&CCD	08033494488	akassehmakasseh@yahoo.com
49.	Aliyu Ibrahim	ES	SEMA Jigawa	08066053679	aliyugmel77@gmail.com
50.	Umaru A. Gwamana	PM	REP-MANR	08069213106	umagromna@yahoo.com
51.	James Eno Uket	Director	Min. of Local Govt. CRS	08032736729	jamesuket@yahoo.com
52.	Ogundu Chidiebere	SDRRO	NEMA	08036751222	chidiogundu@yahoo.com
53.	Engr E. Oni	Director PR&S	Edo state Ministry of Works	08035706361	
54.	Obolo Fumulayo	SPOGIS	NEMA HQS	08138222124	funmob@yahoo.com
55.	Frank Uko Daniel	Ag AD (SC)	FML&P	08062848011	frankuko@yahoo.com
56.	Barr Paul Daniel Cryang	Director LGI	Min. for Local Govt. Jos	08035906832	
57.	Anusim, Manfred I.	PDRRO	NEMA HQ	08038476809	iykemanus@yahoo.com
58.	Ongele D. Igwe	Director Agric.	Min. of Agric. Ebonyi	08077472395	ongelelyntone@yahoo.com
59.	Medugu John Sunday	Director Agric.	Min. of Agric. Lokoja	08166000412	medugujohn@yahoo.com
60.	Dimas E. Skari	ACDRRO	NEMA HQ	08035398956	dewardsk@gmail.com
61.	Avm Gabriel Abdul	SA Dist. MGT	Kogi	08059175527	gababd@yahoo.com
62.	Amama S. A.	DRRO 1	NEMA HQ	08039452007	ask4amamasunny@yahoo.com
63.	Keghku E. Atsem	SSA	BLGCA Benue	07036564434	keghkuea@yahoo.com
64.	Amina Saleh	SDRRO	NEMA HQ	08188808333	mina3015@aol.com

S/ No	Names	Designation	Organization	Phone number	E-mail address
65.	Young Julie	PS	SEMA Delta	08034016121	Julieyoung15@gmail.com
66.	Aisha Abbas	DPR &NDM	SEMA Kaduna	08034724566	
67.	Philomena D. Ailu	Prin. Est.Officer	Min. of Works & Transport Nasarawa	08069172206	
68.	Abdullahi Saleh Dokaji	Director Social	Min. For Local Govt. Jigawa	08066212717	
69.	Temitayo Omole	Project Officer	European Union	08033504742	Temitayo.omole@ecas.europa.eu
70.	Mrs. O. A. Awodiji	PNO	Federal Min. of Health Abuja	08033504742	Funmilola6707@yahoo.com
71.	Afolayan O. A.	PPO	NEMA	07068990517	segement2000@yahoo.com
72.	Shadrach Daniel B.	Exec. SEC	AD SEMA Yola	07039439926	adsemagala@yahoo.com
73.	Hammed S. Abdul	Director	SEMA Kogi	08078372025	hassanhammed788@yahoo.com
74.	Olanrewaju Kazeem A.	SDRRO	NEMA NC	08063141170	kazoalhaji01@yahoo.com
75.	James Dugo	Commissioner	Min. of Local Govt. Bayelsa	08037771970	jamesdugo@yahoo.com
76.	Izuakor Vivan I.	Legal	NEMA HQ	08037785801	duchess4u67@yahoo.com
77.	Ishaya Isah Chonok	CDRRO	NEMA	08030606130	chonokoi@yahoo.com
78.	Sarafu A. Yunusa	Education Specialist	UNICEF	08035350956	syunua@yahoo.com
79.	Shafiu Sidi	DRRO	NEMA HQ	08032422022	shafiu102@yahoo.com
80.	Oluseyi Soremekun	NPO/CI	UNESCO	08033030002	o.soremekun@unesco.org
81.	Victor Nwabuan	PPO	NEMA HQ	08033180741	vugo1@yahoo.com
82.	Akiode S. A.	ACTO	NEMA HQ	08037195603	saoakode@yahoo.com
83.	Abimbola Oyelohunnu	Prog. Officer	UN Women	08037009185	bimbo.oyelohunnu@unwomen.org
84.	Alh. Bappah Azare	HC	MS	08023531800	baphazae@yahoo.com
85.	Engr. Abubakar Jibil	EX	SEMA Kano state	08036359068	abubakarjibil@yahoo.com
86.	Nwachukwu Henry A.	Director of Agric. Abia state	Min. of Agric. Abia	08036298700	akijuobi@yahoo.com
87.	Simon Katu	SDRRO	NEMA NW	08067794177	pfizmail@yahoo.com
88.	Onuoha Omezikam Eze	Consultant	World Bank	08106928160	omezikam@yahoo.com
89.	Aro-Lambo Amina	DRR	NEMA HQ	08054449998	amilycious@yahoo.com
90.	Bunmi Olaorupekun	Assistant Protection Officer	UNHCR	07034059580	olaonpe@unhcr.org
91.	Alae Ballal C.		UNHCR	08134596208	ballahcolunhcr.org
92.	Dr. Judit Giwatan	EO	UNICEF	08033149205	judygiwa@yahoo.com
93.	Ngozi Awuzie	NPO	UNESCO	08037871118	n.awuzie@unesco.org
94.	Mrs. A. Nwite Eze	SDRRO	NEMA HQ	08024237054	nwutteeze@yahoo.com
95.	R. A. Shanu	PTO 1	Ministry of Power	08033809853	adeshunashanu@yahoo.com
96.	Engr. Tani A. Diriyai	Assistant Director	Min. of Work Yenagoa	08036727868	tagdiriyai@yahoo.com
97.	Dr. Isbr	NSO	WHO		
98.	Okunwia Paul	Prog. Officer	UN Habitat	08023045058	paul.okunlola@undp.org

S/ No	Names	Designation	Organization	Phone number	E-mail address
99.	Daniel Etun Obot	ADCR&R	NEMA HQ	08036124213	danielobot16@yahoo.com
100.	Andrew David	Prog. Analyst	UNDP	08033900599	
101.	Stephen Ibem	SA Media	Min. of Agric. Bayelsa	08069250205	stevibem@yahoo.com
102.	Aprezi A. C.	CLO	FML &P Abuja	08023592878	zumyzum08@yahoo.com
103.	Mbana Charles	PAD (WQC&S)	Fed. Min. of Water Resources	08034606065	charllzbomma@yahoo.com
104.	Comrade Musa T.	Deputy President	TUC	08036025424	musa.toly@yahoo.com
105.	Dr. M. Arene	Director	Fed. Min. of Health	08069488809	arene_kano@yahoo.com
106.	Yinusa Deji G.	SAO	NEMA	08033589243	deji16@yahoo.com
107.	Nkea Anucha	SEO	Fed. Min. of Tech.	08025594031	
108.	Tunde Ajiboye	PPO(GIS)	NEMA		tundenemagis@yahoo.com
109.	Lawal Amidun	Prop off	CDD	08065238587	amidunlawal2006@yahoo.com
110.	Dr. Asma T. Ibrahim	CSOHCCM	NASRDA	08062950591	asmabbfarouk2002@gmail.com
111.	R.C. Anyanwu (Mrs)	CPO	National Planning Comm.	08039739095	anyanwurahab@yahoo.com
112.	Lanre Adekanye	Assistant Director	National Planning Commission	08033200204	ladekanye@yahoo.com
113.	Abdulsalam M. B.	Coordinator	NEMA NC JOS	07067477772	salambib001@yahoo.com
114.	Chukwu A. Uju	PAO	Min. of Finance	08058913001	chukwuanthoniauju@yahoo.com
115.	Tochie Odele	Prog. Analyst	UNFPA	0807389300	odele@unfpa.org
116.	Nkiou Igbokwe	Nat.Prog. Officer	UNFPA	08073893009	igbokwe@unfpa.org
117.	Sadiq Muhammd Anwal	PO	NEMA/AOO	08054041207	smawwal05@yahoo.co.uk
118.	Chimezie Anene	Deputy Director	Fed. Min. of Lands & Urban Development	08033498153	aneneode@yahoo.com
119.	C. I. Okpaleke	AD (WS)	Fed. Min. of Water Resources Abuja	080525296	christainokpaleke@yahoo.com
120.	Igbinosun Emma	CLO	Min. of Labour & Productivity	07034054991	emanox@yahoo.com
121.	Engr. D. E. Okwuora	DD Civil	Min. of Works Imo state	08033273806	domokwu@yahoo.com

PDNA Team Training November 14, 2012

S/ No	Names	Designation	Organization	Phone number	Email address
1.	Rev. M. I. Nwabufo	Rep. DG	NIHSA/FMWR	08037861797	mnwabufo@yahoo.com
2.	Aprezi A. C.	CLO	FML&P	08023592878	zumyzum08@yahoo.com
3.	George Igelegbai	Edu Sector	UNICEF	08034035234	gigelegbai@unicef.org
4.	Laetitia Barnier		World Bank	08102007145	laeliha.barnier@hotmail.org
5.	Godwin Auguio	Prog. Specific	UNFPA	08073893007	asuguo@unfpa.org
6.	J. A. Kehinde	DD Health Emergency Response	FMOH	08023210923	akinjkhinde@yahoo.com
7.	Kuponu Olowakemi		UNDP	08051810669	sesikop2@yahoo.com
8.	Jonathan Klent	C Pai	UNDP		
9.	Odele M. O.	TLM	UNDP	08023361263	muyiwa.odele@undp.org
10.	Dr. Isibor	NSO	WHO	08023079104	isibori@ng.afro.who.int
11.	Damachi Joyce	ACLO	Fed. Min. of Labour	08028674944	happyjoyce4life@yahoo.com
12.	Frank Uko Daniel	Ag AD (SC)	Fed. Min. of Labour	08062848011	frankuko@yahoo.com
13.	Rami Quttaineh	DRM	World Bank		rquuttaineh@worldbank.org
14.	Abbani Imam Garki	PDRRO	NEMA	08065123532	abbanii@yahoo.com
15.	Amama S. A.	DRRO1	NEMA	08039452007	ask4amamasunny@yahoo.com
16.	Aro Lambo Amina	DRR	NEMA	08054449998	amilycious@yahoo.com
17.	Shafiu Sidi	DRRO11	NEMA	08032422022	shafiu102@yahoo.com
18.	Raji M. A.	SPO	NEMA	08028617847	raji.adejoke@nema.gov.ng
19.	Onuoha Omezikam Eze	Consultant	World Bank	08106928160	omezikam@yahoo.com
20.	Nwokedi N. F.	AD	NBS	08039224637	ngwokedi@gmail.com
21.	Rita Missal		UNDP		rita.missal@undp.org
22.	Alao Mattew		UNDP		mato_a@yahoo.com
23.	Asha Kambon		World Bank		a_kambon@hotmail.com
24.	Anusim Manfred I.	PDRRO	NEMA	08038476809	iykemanus@yahoo.com
25.	Etenko John Onah	Corper	NEMA	07032901916	deejaystone@yahoo.com
26.	Ufondu Mercy Ebele	DRR	NEMA	08036878172	mercydamsel2009@yahoo.com
27.	M. Aliyu		World Bank		maliyu@worldbank.org
28.	Amina Saleh	SDRRO	NEMA	08188808333	mina3015@aol.com
29.	Bankole Babalola	Project Manager	Shebath lid	09090940102	bankolebabalola@yahoo.co.uk
30.	Roberto Jovel		World Bank		rjovel@jovel.org
31.	Alhaji Mustapha	Nat. Expert	UNIDO	08030644817	almus_2@yahoo.com
32.	Omole Temitayo	Project Officer	ECL	08037018490	temitayo.omole@ecas.europa.eu
33.	Engr A. E. Uwueyuen	AD EIS	FMP	08055204502	umuenyen20002001@yahoo.com
34.	Shanu R. Adeshina	PTO 1	Power Ministry	08033809853	adeshina_shanu@yahoo.com
35.	Abel Philip	ELECT ENGR	FMP	08036352892	idokophilip@yahoo.com
36.	Hassan Usman G.	AOR	FMT&L	08029046661	hassangwandu@yahoo.com
37.	Dimas E. Skari	ACDRRO	NEMA	08035398956	dewardsk@gmail.com

S/ No	Names	Designation	Organization	Phone number	Email address
38.	V. S. Tsakma	DD	National Pop. Comm.	08036305881	vs_tsakma@yahoo.com
39.	Moses C. John	DD	Nat POP comm.	08034501551	mosesiknlu@yahoo.com
40.	Mrs O. A. Awodiji	PNO	FMOH	08033504742	funmilola6707@yahoo.com
41.	Engr. M. A. Kopada	AD	FMENV	08055220685	kopada1m@yahoo.com
42.	Dr. K. P. Fadahnnsi	MO	FMOH	07033237819	phikfada@yahoo.co.uk
43.	Mrs. Nkechi Onwukwe	AD	FMWASD	08037880498	kerisgold@yahoo.com
44.	Engr. Umunna Ekenna	DD	FMW	08033091493	ucekenna@yahoo.com
45.	Musa Abdulrazar	PDRRO	NEMA	08058013035	abdulrazaqmusa@hotmail.com
46.	Asma T. Ibrahim	CSO	NASRDA	08062950591	asmabbfarouk2002@gmail.com
47.	Abdulkareem Isah A.	SO	NASRDA	08035903551	abkdom@yahoo.co.uk
48.	Wilson S. M.	GM	NIMET	08050504953	smpsnwilson@yahoo.com
49.	Dr. E. Musa	DPC Adviser	WHO	08035354870	musa@ng.afro.who.ink
50.	Mrs. A. Nwite-Eze	SDRRO	NEMA	08024257054	nwitteeze@yahoo.com
51.	Anene Chimezie O.	Deputy Director	Fed. Min. of Land, Housing & Urban Dev.	08033498153	aneneode@yahoo.com
52.	Antonio Cruciani		ILO	08068010967	crcuiani@ilo.org
53.	Ihekwa Obiageli	Deputy Director	FME	08033113445	obykwabidis@yahoo.com
54.	Mary Ameh	Assistant Director	FME	08037222800	aladiameh@gmail.com
55.	Uwuzuruonye Justin	Head GIS	NEMA	08034801603	juwazuruonye@yahoo.com
56.	Akpan J. J.	CLO	FML&P	08027098922	josephjonahakpan@yahoo.com
57.	Abnbakar Halima	PO	NPC	08131657631	awuwakarhalima@yahoo.com
58.	Lanre I. Adekanye	AD	NPC	08033200204	ladekanye@yahoo.com
59.	Nkem Anucha	PEO	Trade & Invest	08025594031	
60.	Engr Musa Labaran	PE	Fed. Min. of Environment	08033493751	musalabara04@yahoo.com
61.	Kabir M. Yari	Program Manager	UN Habitat	08033141100	kabir.yari@undp.org
62.	Klaus Gautsch	HOS	EU		
63.	Dr MrsD S. Bellgore	DD NCDC	FMOH	08033144442	beldoc@yahoo.com
64.	Mr. Okezie H. C.	PAO (P)	FMT & I	08036693261	Henzee1965@yahoo.com
65.	Dr. Mrs. M. A. Oyeleke	Program Coordinates	FMENV	08033143792	
66.	R. C. Anyanwu (Mrs.)	CPO	NAH Plan. Comm.	08039739095	anyanwurahafi@yahoo.com
67.	Yinka Babalola	Economist	World Bank	07032704505	ababaloba@worldbank.org
68.	Salau Sheu	RDS	World Bank	08033241506	ssalan@worldbank.org
69.	Pst. Friday D. Afiakurue	DD (EA Dept)	FMENV	08027454695	fridayfiakurue@yahoo.com
70.	Stephen Danyo	Senior NPR specialist	World Bank		sdanyo@worldbank.org
71.	Joseph Akpokodje	Senior Environmental Specialist	World Bank	08033740948	jakpokodje@worldbank.org
72.	Ngozi Awuzie	NPO Education	UNESCO	08037871118	n.awuzie@unesco.org
73.	Bashir Sulaiman	AD (HGI)	NIHSA	08027990783	najibsalim@yahoo.com
74.	Jennifer Anusim	SARO	NEMA	08034284586	ibe_jenny@yahoo.com

S/ No	Names	Designation	Organization	Phone number	Email address
75.	Prof E.O Iguisi		UNDP Consultant	08037037516	ediguisi@yahoo.com
76.	Onehi A.H Mrs	Muti ACEO	FME	08023736084	Onehi2012@yahoo.com
77.	Anyaku O. N. Mrs.	AD (multi)	FME	08037242884	Onyeka.anyaku@yahoo.com
78.	Alyiu Sambo B.	DD/DRR)	NEMA	08032555372	baffalesambo@yahoo.com
79.	Oladipo C. F.	CWO/HR	FMWASD	08023337426	funkeoladipo@aol.com
80.	Abubakar Bashir	Planning Officer	NPC	08034112991	damanidada82@gmail.com

PDNA Team Training November 16, 2012

S/ No	Name	Designation	Organization	Phone number	Email
1.	Ezekiel S. Kwambo	Director	MOE Jalingo	08029880043	
2.	Paul M. Tino	Director	SEMA Jalingo	08126659090	paulmtino@yahoo.com
3.	Shuaibu Bello Mohd	–	NEMA	07063600616	fadeelaho@yahoo.com
4.	Dr. (Mrs.) Folake Olatunji D.	Asst. Dir.	FME	08023433190	folatunjisp@yahoo.com
5.	Sobogun Oluwasegun	CEO	FME	08033352208	segbog2020@yahoo.com
6.	Ajaezi, Godwin O.	GM	NIMET	08032870075	goajaezi@yahoo.co.uk
7.	Bashir Sulaiman	AD (HGI)	NIHSA	08027990783	najibsalim@yahoo.com
8.	Awoibi Joe - Ukairo	Hgl.	NIHSA	08023353771	awoibit@yahoo.com
9.	Dimas Edward Skari	ACDRRO	NEMA	08035398956	dwardsk@gmail.com
10.	Abbani Imam Garki	PDRRO	NEMA	08065123532	abbanii@yahoo.com
11.	Mrs. A. Nwite Eze	SDRRO	ENMA	08024237054	nwite-eze@yahoo.com
12.	J. E Alozie	GM/CS	NIMET	08038620950	jealozie@gmail.com
13.	Kangheh A. Caphas	PM (OH&S)	PHCN	08036128032	kanghecephas@yahoo.com
14.	A. Abdulkareem	OFFR. 2 (OH&S)	PHCN	08062710506	asquare7000@yahoo.com
15.	Usoroh A. U.	CTO	NIHSA	08065564226	usorohakpan@yahoo.com
16.	Kunsuk P. T.	AC Hydrologist	NIHSA	08065849593	pehutar@yahoo.com
17.	Tadanori Kitamura	Hydrologist	JICA Proj. Team	0815-950-3363	kitamura@ctii.co.jp
18.	J. B. Bisong	Asst. Director	Nig. Hydro/SA	08034243224	jimbisong@gmail.com
19.	Moha Stephen Nwaeze	Principal TO	NIHSA	08038021840	moha-stephen@yahoo.com
20.	Margaret Allahyafi Daniel	Principal Scientific Officer	Water Resources	07035995134	margaretallahyafi@yahoo.com
21.	Bashir Sulaiman	Water	NIHSA	08027990783	najibsalim@yahoo.com
22.	Mrs. Fashe F. H. Adam	Water	NIHSA	08061664139	mafashe@yahoo.com
23.	Awoibi Joe Ukairo	Water	NIHSA	08023353771	awoibit@yahoo.com
24.	Ajaezi Godwin O.	Agromet	NIMET	08032870075	goajaezi@yahoo.com
25.	Shafiu Sidi	DRRO 11	NEMA	08032422022	shafiu102@yahoo.com
26.	Amina Saleh	SDRRO	NEMA	08188808333	mina3015@aol.com
27.	Jegede Bayode	Asst. Director	FMENV	08037868521	gbj@yahoo.com
28.	Raji M. Adejoke	SPO	NEMA	08028617847	raji.adejoke@yahoo.com
29.	Engr. E. Onyechokwa	SCE	FMW	08023001803	edmondon@yahoo.uk
30.	Igwe Chibunna O.	Oil and gas	National Oil Spill Detection and Response	08027608286	coigwe@gmail.com
31.	Sunday S. Garba	Director Planning	Min. of Works	08065302077	shemgarba@yahoo.com
32.	Isiyaka E. Bashir	ProgramManager	Taraba RUWASSA	08026263663	isiyakabashir@yahoo.com
33.	Margaret Allahyafi Daniel	Prog. Manager	Water Resource	07035995134	margaretallahyafi@yahoo.com

S/ No	Name	Designation	Organization	Phone number	Email
34.	Mrs. F. K. Bulus	Assistant Director	FMWASD	08065492113	friakinade@yahoo.com
35.	Dr. Abdullahi Idris	E/S	SEMA Nasarawa	08037022808	dr.abdullahiidris@yahoo.com
36.	Mbama Charles	PA (D: WQC&S)	Min. of Water Resources	08034606065	charlyzbomma@yahoo.com
37.	Oladipo C. F.	FMWASD	CWDO	08023337426	funkeoladipo@aol.com
38.	Engr R. A. Agbaminaja	Engineer	FMWR	08052460090	rap_agbas@yahoo.com
39.	Alao Matthew	DRR	UNDP	08096095983	mato_a@yahoo.com
40.	E. O. Iguisi	UNDP Consultant	UNDP	08037037516	ediguisi@yahoo.com
41.	Hanson Ifiok	Environmental Scientist	FMENV	08062376471	ifiokhanson4real2yahoo.com
42.	Babatunde J. O.	Asst. Director	FMA&RD	08033150343	babatundejhn@yahoo.com
43.	Oshadiya O. O.	Asst. Director	FMA&RD	08023279119	oshadiyapekun@gmail.com
44.	Gloria Enueze	Gender UNDP	UNFPA	08056596968	enueze@unfpa.org
45.	Amos Abu	Snr. Env.Specialist	World Bank	08037529220	aabu@worldbank.org
46.	Bankole Babalola	Consultant	Shebath	08090940102	bankolebabalola@yahoo.co.uk
47.	Engr. Musa Labaran	Fed. Min. Envir.	PE	08033493751	musalabaran04@yahoo.com
48.	Ufonde Mercy E.	NEMA	DRR	08036878172	mercydamsel2009@yahoo.com
49.	Ani Ifeoma O.	Oil & Gas	NOSDRA	08035926933	folusoayodele@yahoo.com
50.	Fashe F. H. Adam	HGL	NIHSA	08096166413	mafash@yahoo.com
51.	Engr. Amodu D. A.	ACHY	NIHSA	08033498574	danamodu@yahoo.com
52.	E. Kosoko King	Asst. Director	FMARD	08033511465	eddylizzyking@yahoo.com
53.	Abdulkadir Ibrahim	I.O 11	NEZ	08039149667	abdulkezo01@yahoo.com
54.	Osuj Uchechukwu G.	EE11 Civil Engr.	FMW	08039577856	uchmandxyz@yahoo.com
55.	Onokpasa Edward	EE11 Civil Engr.	FMW	08030968812	k.onokpasa@yahoo.nz
56.	Engr. Usman Yakubu	PCE	FMW	08036788411	yakubu24@yahoo.com
57.	Chidawa Paul A.	CTO	FMW	08033145351	paulchidawa@yahoo.com
58.	Seth Vordzorgbe		UNDP	08163693867	Seith.vordzorgbe@undp.org
59.	Aro-Lambo Amina	NEMA	DRR	08054449998	amilicious@yahoo.com
60.	Joseph Akpokodje	Snr. Envir. Specialist	World Bank	08033740948	jakpokodje@worldbank.org
61.	Engr. Kopada M. A.	AD	FMENV	08055220685	Kopada1m@yahoo.com
62.	Laetitia Barnier	World Bank		08102004571	Laetitia.Barnier@hotmail.com
63.	Nkechi Onwukwe	FMWASD	AD	08037880498	kerisgold@yahoo.com
64.	Aliyu B. Sambo	NEMA	DD/DRR	08032555372	
65.	Pst. Friday D. Afiakubue	FMENV	DD	08027454695	fridayafiakurue@yahoo.com
66.	Edu Folorunso A.	FMWR	GEO1	08058471452	Edfolly2003@yahoo.com
67.	Okolie V. N. (Mrs.)	FME	AD	08037808386	okotel@yahoo.com
68.	Amama Sunday	NEMA	DRRO1	08039452007	Ask4amamasunny@yahoo.com
69.	Musa Abdulrazaq	NEMA	PDRRO	08058013035	abdulrazaqmusa@hotmail.com

Field Work Team November 21-27, 2012

Name	Subsector	Organization	Phone number	Email
Abubakar Bashir	Macroecon P. S.	Nat. Planning Com.	8034112991	damanidada82@gmail.com
Wilson S. M.	DRM	NIMET	8050504953	smpsnwilson@yahoo.com
Daniel Etim Obot	DRM	NEMA	8036124213	danielobot16@yahoo.com
Eric Ebhodaghe	DRM	NEMA	8133370856	ericisi@rockectmail.com
Ayodele Foluso	Environment	NOSDRA		
Nwokedi Ngozi	Macroecon. / P. S.	NBS	8039224637	ngnwokedi@gmail.com
Fashe F. H. Adam	WASH	NISHE	8096166413	mafashe@yahoo.com
Engr. Agbaminoja	WASH	FMWR		
Dr. Fadahunsi K. P.	Health	FMOH	7033237819	philsfad@yahoo.co.uk
Sobogun Oluwasegun	Education	FME	8033352208	segbog2020@yahoo.com
Mrs. Nkechi Onuwka	Gender	FMWASD	8037880498	kensgold@yahoo.com
Babalola B.	Environment	FMENV		
Frank Uko Daniel	Livelihood / Employ.	Fed. Min. of Labor	8062848011	frankuko@yahoo.com
Aliyu Mohammed	Transport	World Bank		maliyu@worldbank.org
A. C. Kangeh	Power	PHCN		
Ihekwa Obiegeli	Education	FME	8033113445	obykwabidis@yahoo.com
Dimas Edward Skari	DRM	NEMA	8035398956	dewardsk@gmail.com
Ogundu Chidiebere	DRM	NEMA	8036751222	chidiogundu@yahoo.com
Anene Chimezie	Housing	FMLH &UD	8033498153	aneneode@yahoo.com
Mrs. O. A. Awodiji	Health	FMOH	8033504742	funmilola6707@yahoo.com
Dr. Ms. M. A. Oyeleke	Environment	FMENV	8033143793	keji4_jesus@yahoo.com
Muyiwa Odele	Environment	UNDP	8023361263	muyiwa.odele@undp.org
Nkem Anucha	Trade / Industries	Trade and Invest.	8025594031	hassanugwandu@yahoo.com
Aprezi A. C.	Livelihood / Employ.	Labour & Product.	8023592878	zumyzum08@yahoo.com
Joseph Akpokodje	Cross cutting	World Bank	8033740948	jakpokodje@worldbank.org
Prof. Olaseni Bello	Livelihood / Employ.	ILO	7066807750	seni_bello@yahoo.com
Philip Obasi	Energy	NPC	8035436352	philobasi@yahoo.com
Igwe C. O.	Environment	NOSDRA	8027608286	coigwe@gmail.com
Engr. O. Uchechukwu	WASH	NIHSA		
Anyanwu, R. C.	Macro Econ. P. S.	NPC	8039739095	anyanwurahab@yahoo.com
Sajid Anwar	Transport	World Bank	8102007938	sanwar@worldbank.org
Akeode Saheed	DRM	NEMA	8037195653	saodked@yahoo.com
Usman Yakubu	Transport	FMW	8036788411	yakubu24@yahoo.com
Hansen Ifiok	Environment	FMENV	8062376471	talk2hanson@gmail.com
Kunsuk P.T.	WASH	NIHSA	8065849593	pekutar@yahoo.com
Ezekiel Kwambo	Gender		8029880043	
Abdukadir Ibrahim	DRM	NEMA		
Godwin Asuquo	Health	UNFPA	8073893007	asuquo@unfpa.org
Joy Micheal	Gender	UNFPA	8053566658	

Name	Subsector	Organization	Phone number	Email
Anusium Fred	DRM	NEMA	8038476809	iykemanus@yahoo.com
Prof E.O. Iguisi	DRM	UNDP	8037037515	ediguisi@yahoo.com
Vandu S. Tsakma	Macro Econ. P. S	Nat. Population Com.	8036305881	vs_tsakma@yahoo.com
Ameh M. A. (Mrs.)	Education	FME	8037222800	aladiameh@gmail.com
Ishaya I. Chonoko	DRM	NEMA		
Musa Abdulrazaq	DRM	NEMA	8058013035	abdulrazaqmusa@hotmail.com
Ani Ifeoma	Environment	NOSDRA	8035926933	ifeoma.queen@yahoo.com
Moha Stephen Nwaeze	WASH	NISHA		
Oladipo C. F.	Gender	FMWASD	8023337426	funkeoladipo@aol.com
Friday D. Afiakurie	Environment	FMENV		
Kitamura Tadanori	WASH	World Bank/CTI Japan	8159503363	kitamura@cti.co.jp
Chidawa Paul A.	Governance and Public Infrastructure	FMW	8033145351	paulchidawa@yahoo.com
R. A. Shanu	Energy	FMP	8033809853	adeshinashanu@yahoo.com
Archibong, C. D.	Livelihood and Employment	FML & P	0806401129	crysdm@yahoo.com
Roberto Jovel	Cross cutting	World Bank	8102007955	rjovel@jovel.org
Laetitia Barnier	Cross cutting	World Bank		laetitia.barnier@hotmail.fr
A. Abdulkareem	Power	PHCN		
Lanre Adekanye	Energy	Nat. Population Com.	8033200204	ladekanye@yahoo.com
Doekle Wielinga	Cross cutting	World Bank		dwielinga@worldbank.org
Damachi, Joyce	Livelihood and Employment	NPC	8033200204	happyjoyce4life@yahoo.com
Salau Sheu	Agriculture, Fisheries and Livestock	World Bank	8028674944	ssalau@worldbank.org
Olarewaju Kazeem	DRM	NEMA	8063141170	kazoalhji01@yahoo.com
Ayaoku, Onyeka N.	Education	FME	8027990783	onyeka.anyaoku@yahoo.com
Joseph Alozie	Transport	NIMET		
Idowu Araonyigbo	Health	UNFPA	8054119724	araonyigbo@unfpa.org
Gloria Enueze	Gender	UNFPA	8056596968	enueze@unfpa.org
Shafiu Sidi	DRM	NEMA		
Abdulsalam M. B.	DRM	NEMA	7067477772	salambib001@yahoo.com
Kupada Mustapha A.	Environment	FM of Environment	8055220685	kopada1m@yahoo.com
Engr. Amodu D. A.	WASH	NIHSA	8033498574	danamodu@yahoo.com
Esmond Onyechokun	Transport	FMW		
Philip Abel	Energy	FMP	8055204502	idokophilips@yahoo.com
Rev. M. I Nwabufu	WASH	FMP	8036352892	mnwanufu@yahoo.com
Bachir Sulaiman	WASH	NIHSA/FMWR	8037861797	najibsalim@yahpp.com
Hassan Usman Gwandu	Trade and Industries	FME	8037242884	hassangwandu@yahoo.com
Asha Kambon	Gender + PDNA Trg.	World Bank	8102007948	a_kambon@hotmail.com
Simon Katu	DRM	NEMA	8067796177	profzmail@yahoo.com
J. B. Bisong	WASH	NIHSA		

Name	Subsector	Organization	Phone number	Email
Okpuno J. U.	Livelihood and Employment	FML & P	8055179383	uljessie@yahoo.com
G. B. Jegede	Environment	FMENV		
Okoli Etolue	Education	FME	8037808386	okotel@yahoo.com
Kehinde John	Health	FMOH	8023210923	
Edu Folorunso	WASH	FMWR	8058471452	edfolly2003@yahoo.com
Akasseh J. Mathias	Infrastructure	FML		
Andorbe Sunday	DRM	NEMA		
Mbama Charles	WASH	FMWR	8034606065	charlyzbomma@yahoo.com
F. C. Meto	Energy	FMP	8030870362	metufrank@yahoo.com
Margaret Allahy	WASH	FMWR	7035995134	margaratallahyah@yahoo.com
Mrs. Friya Kimda Bulus	Gender	FMWASD	8065492113	friyakimde@yahoo.com
Oshadiya O. O.		FMA	8023279119	oshadiyapekun@gmail.com
Alpan Joseph	Livelihood / Employ.	Labour & Product.	8098636296	josephalapan@yahoo.com
Engr. Musa Labaran	Environment	FMENV	8033493751	musalabaran04@yahoo.com
Mrs. Hadiza Onehi	Environment	FMENV	8029046661	onehi2012@yahoo.com
Moses, C. John	Energy	NPC	8034501551	mosesikulv@yahoo.com
Abbani Imam Garki	DRM	NEMA	8065123532	abbani@yahoo.com
Musa Ilallah	DRM	NEMA	8033146397	musahk123@yahoo.com
Sunday S. Ganba				
Amanda Lumun Feese		World Bank		afeese@worldbank.org
Onkpasa E.		FMW	8030968812	k.onokpasa@yahoo.com
Usoroh A. U.	Water, Sanitation, and Hygiene	NISHA	8065564226	usorohakpan@yahoo.com
Isiyaka E. Bashir	Water, Sanitation, and Hygiene	NIHSA	8027990783	najibsalim@yahoo.com

ANNEX 5

Description of the HRNA Community Consultation and Validation Survey

	Geo-political Zones	States	Number of LGAs	Settlements	Number of Households	Institutions/Consultants
1	North-West Center zone	Jigawa, Zamfara	7	35	383 (Jigawa only)	Prof. E.O. Iguisi, Ahmadu Bello University, Zaria, Kaduna
2	South-South Center zone	Bayelsa, Delta, Rivers	18	203	780	Prof. Samuel Arokoyu, University of Port Harcourt, Rivers state
3	North-East Center zone	Adamawa, Taraba	6	8 (Taraba only)	757	Prof. Umar Maryah, University of Maiduguri, Bornu state
4	South-East Center zone	Anambra, Imo	4	31	750	Dr. Kingsley Ogboi, University of Nigeria Nsukka, Enugu state
5	North-Central Center zone	Kogi, Niger	6	10	685	Prof. Ola Jinadu, Federal University of Technology Minna, Niger state
6	South-West Center zone	Oyo, Ogun	13	21	969	Dr. Ibidun Adelekan, University of Ibadan, Oyo state
Total	6	13	54	308*	4303	

*Excluding Adamawa



National Emergency Management Agency

Address: Plot 439 (No. 8), Adetokunbo Ademola Crescent,
Maitama, Abuja, Nigeria
Telephone: (+234)09-2905777
Email: info@nema.gov.ng

World Bank Nigeria Country Office

Address: 102 Yakubu Gowon Crescent, Opposite ECOWAS Secretariat,
P.O. Box 2826, Garki, Abuja, Nigeria
Telephone: +234-703-583-0641
Email: otohomdet@worldbank.org