

Acknowledgements

Advisory Board

Chair

Margareta Wahlström, Special Representative of the Secretary-General for Disaster Risk Reduction

Members

Wadid Erian, Head of Land Resource Studies, The Arab Center for the Study of Arid Zones and Dry Lands, Damascus, Syrian Arab Republic

Virginia Garcia Acosta, Director, Centre for Research and Advanced Studies in Social Anthropology, CIESAS, Mexico DF, Mexico

Michelle Gyles-McDonough, United Nations Resident Coordinator for the Eastern Caribbean, Bridgetown, Barbados

John Holmes, Director, Ditchley Foundation, Ditchley, United Kingdom.

Michel Jarraud, Secretary General, World Meteorological Organization, Geneva, Switzerland

Randolph Kent, Director, Humanitarian Futures Programme, King's College, London, United Kingdom

Allan Lavell, Coordinator, Programme for Environmental and Disaster Risk, Latin America Social Science Faculty (FLACSO), San Jose, Costa Rica

Patrick Liedke, Former Secretary General, the Geneva Association for Risk and Insurance Economics, Switzerland

Ibrahim Osman, Former Deputy Secretary-General, International Federation of Red Cross and Red Crescent Societies, Geneva, Switzerland

Aromar Revi, Director, Indian Institute for Human Settlements, New Delhi, India

Johan Schaar, Co-Director, Vulnerability and Adaptation Initiative, World Resources Institute, Washington DC, USA

Youba Sokona, Coordinator, African Climate Policy Centre, United Nations Economic Commission for Africa, Addis Ababa, Ethiopia

Dennis Wenger, Programme Director, Element

1638, National Science Foundation, Arlington, USA

Sandra Wu, Chief Executive Officer, Kokusai Kogyo Corporation, Japan

Coordinating Lead Authors

Andrew Maskrey and **Bina Desai**, United Nations Office for Disaster Risk Reduction (UNISDR), Geneva, Switzerland

GAR project team at UNISDR

Julio Serje, national disaster loss data and analysis, Annex 2, on-line tools; **Marc Gordon**, HFA Monitoring, disaster risk reduction investment tracking, Annex 3; **Kazuko Ishigaki**, economic analysis and research; **Manuela Di Mauro**, global risk analysis, Annex 1; **Sylvain Ponserre**, geospatial data visualisation and on-line products; **Frederic Delpech**, editorial assistance, production coordination and administrative support; **Vicente Anzellini**, research assistance, references and case studies; **Vincent Fung**: case studies and online products.

Collaborating Institutions

The following institutions and individuals coordinated, developed and supported research, studies, workshops and peer reviews for GAR13:

Arab Centre for the Study of Arid Zones and Dry Lands – ACSAD, Syria (Wadid Erian); **Blended Capital Group**, Switzerland (Paul Clements-Hunt); **CIMA Foundation**, Italy (Roberto Rudari); **CIMNE and Associates (ITEC S.A.S. INGENIAR LTDA. EAI S.A.)**, Colombia and Spain (Omar Dario Cardona); **Centro Internacional de Metodos Numericos en Ingenieria – CIMNE and Associates, Universitat Politonica de Catalunya** (Alex Barbat); **Corporacion OSSO**, Colombia, (Andres Velasquez, Cristina Rosales); **DARA International**, Spain (Nicolai Steen); **Earth Literacy Programme**, Japan (Shin'ichi Take-mura); **Famine Early Warning Systems Network –**

FEWSNET, USA (Jim Verdin and Greg Husak); the **Geneva Association for Risk and Insurance Economics**, Switzerland (Walter Stahel, Meghan Orie); **Geoscience Australia**, Australia (John Schneider); **Global Earthquake Model – GEM**, Italy (Rui Pinho); **Global Fire Monitoring Centre**, Germany (Johann Goldhammer); **Government of Mexico, Sistema Nacional de Protección Civil**, Mexico (Laura Gurza Jaidar); **Humanitarian Futures Programme**, United Kingdom (Randolph Kent); **Indian Institute for Human Settlements – IIHS**, India (Aromar Revi); **Integrated Research on Disaster Reduction – IRDR**, China (Jane Rovins); **International Institute for Applied Systems Analysis – IIASA**, Austria (Reinhard Mechler, Stefan Hochrainer); **Ipsos Mori**, United Kingdom (Laura Cunningham); **Latin America and Caribbean Center, Florida International University - FIU**, USA (Juan Pablo Sarmiento); Lincoln University, New Zealand (Roche Mahon); **Norwegian Geotechnical Institute- NGI**, Norway (Farrokh Nadim); **Price Waterhouse Coopers – PwC**, Switzerland and United Kingdom (Oz Ozturk and Madiha Bakhir); **Risk Management Solutions – RMS**, London (Robert Muir-Wood); **Save the Children International**, Kenya (Johara Bellali); **University College London, Development Planning Unit**, United Kingdom (Cassidy Johnson); **University of Sao Paulo**, Brazil (Marcos Fava Neves), **United Nations Development Programme**, USA (Angeles Arenas and Chiara Melluchi); **United Nations Educational Scientific and Cultural Organization – UNESCO**, France (Alexandros Makarigakis), **United Nations Environment Programme - UNEP-GRID**, Switzerland (Pascal Peduzzi); **Willis Research Network**, London (Rowan Douglas); **World Agency for Planetary Monitoring and Earthquake Risk Reduction – WAPMERR**, Switzerland (Max Wyss); **World Bank**, USA (Francis Ghesquiere); **World Meteorological Organisation – WMO**, Switzerland (Maryam Golnaraghi, Robert Stefanski).

Contributors and Authors

Yoganath Adikari (ICCHARM); Mairun Alves Pinto (University of Sao Paulo); Dilanthi Amaralatunga (University of Salford); Angeles Arenas (UNDP); Craig Arthur

(Geoscience Australia); Beatriz Asensio (DARA International); Ali Asgary (York University); Funda Atun (Polytechnic University of Milan); Madiha Bakir (PwC); Haider Awad, (ACSAD); Murat Balamir (Middle East Technical University); Alex Barbat (CIMNE and Associates); Abdul Bashir (Instituto de Altos Estudios, Corporacion OSSO); Adele Bear-Crozier (Geoscience Australia); Susanne Becken (Lincoln University); Johara Bellali (Save the Children International); Gabriel Bernal (CIMNE and Associates); Karen Bernard (UNDP); Sanjaya Bhatia (International Recovery Platform); Guido Biondi (CIMA Foundation); Adriana Bonilla (Latin American Faculty of Social Sciences – FLACSO); Timothy Boothman (PwC); Alice Brenes (Universidad Nacional de Costa Rica); Octavia de Cadiz (Corporacion OSSO); Belén Camacho (DARA International); Alice Caravani (Overseas Development Institute - ODI); Omar Dario Cardona (CIMNE and Associates); Ann Carpenter (Georgia Institute of Technology); Carlos Castillo (PwC); José M. Cepeda (NGI); Martha-Liliana Carreño (CIMNE and Associates); PG Dhar Chakrabarti; Alexandre Cherix (PwC); Donna Childs (Prisere LLC); Paul Clements-Hunt (The Blended Capital Group); Samantha Cook (Secretariat of the Pacific Community – SPC); Jimena Cuevas (CIESAS); Andrea DeBono (UNEP-GRID); Domenico del Re (PwC); Patrick Dahmen (PwC); Herry Darwanto; Nigel Davis (Willis Re); Fabio Delogu (CIMA Foundation); Manuel Díaz (Ministry of Environment and Natural Resources of El Salvador); Daniel Dowling (PwC); Mark Edwards (Geoscience Australia); Wa-did Erian (ACSAD); Miguel Esteban (Waseda University); Marisol Estrella (UNEP); Marcos Fava Neves (University of Sao Paulo); Aurélien Feix (PwC); Al-mudena Fernandez (UNDP); Vanessa Foo (Economist Intelligence Unit); Urbano Fra Paleo (University of Santiago de Compostela); Chris Funk (FEWS NET); Simone Gabellani (CIMA Foundation); Matthias Garschagen (United Nations University); Ebru Gencer (Columbia University); Marci Gerulius-Darcy (Metropolitan State University and Augsburg College) Kari-mi Gitonga (Save the Children International); Sylfest Glimsdal (NGI); Johann Goldhammer (GFMC); Diana M. González (CIMNE and Associates); Peter Gubbels (Groundswell International, Ghana); Fadi Hamdan

(Disaster Risk Management Centre, Lebanon); Guoyi Han (Stockholm Environment Institute); Masahiko Haraguchi (Columbia University); Carl B. Harbitz (NGI); Christian Herold (UNEP-GRID); Celine Herweijer (PwC); Harvey Hill (Agriculture and Agri-Food Canada, Government of Canada); Gabriela Hoberman (FIU); Stefan Hochrainer (IIASA); Rubem Hofliger (Government of Mexico); Solomon M. Hsiang (Princeton University); Alvaro I. Hurtado (CIMNE and Associates); Greg Husak (FEWSNET); Sanaa Ibrahim (ACSAD), Bingi Ingirige (University of Salford); Oscar Ishizawa (World Bank); Michel Jaboiedoff (University of Lausanne); Garima Jain (IIHS, India); Harikishan Jayanthi (FEWSNET); Rohit Jigyasu (IIHS); Nayibe Jimenez (Corporacion OSSO); Amir S. Jina (Columbia University); Ase Johannessen (Stockholm Environment Institute); Cassidy Johnson (University College London); David Johnston (Institute for Geological and Nuclear Sciences, Massey University, New Zealand); Susan Rachel Jose; Irene Karani (LTS Africa, Kenya); Bassem Katlan (ACSAD); Jan Kellett; Randolph Kent (Humanitarian Futures Programme, Kings College); Hanne Louise Knaepen (Kyoto University); Jeremie Kreitz (Economist Intelligence Unit); Oded Kunik (Syngenta, Kenya); Upmanu Lall (Columbia University); Joanne Linnerooth-Bayer (IIASA); Finn Løvholt (NGI); Roché Mahon (Lincoln University); Ana Maria Majano (INCAE Business School, Costa Rica); Tariq Magsood (Geoscience Australia); Mabel-Cristina Marulanda (CIMNE and Associates); Reinhard Mechler (IIASA), Chiara Melluchi (UNDP); Ouejdane Mejri (Polytechnic University of Milan); Scira Menoni (Polytechnic University of Milan); Takahito Mikami (Waseda University); Kazu Miyamura (PwC); Marcus Moench (ISET, Nepal); Giovanni Molina (Ministry of Environment and Natural Resources of El Salvador); Miguel Mora (CIMNE and Associates); Farrok Nadim (NGI, Norway); Tadashi Nakasu (ICHARM); Tristan Nguyen (WHL Graduate School of Business and Economics); Bettina Ngweno (Aga Khan University, Kenya); Toshio Okazumi (ICHARM); Juan C. Olaya (CIMNE and Associates); Onesmo oleMoiYoi (Nairobi University); Richard Olson (FIU); Mario Ordaz (UNAM CIMNE advisor); Meghan Orie (The Geneva Association for Risk and Insurance Economics); Jose Carlos Orihuela (Pontificia Universidad Católica del Perú); Bassem Ouldbedy (ACSAD), Oz Ozturk (PwC); Belén Paley (DARA International); Jyotiraj Patra (Concern Worldwide); Marco Pagani (GEM); Abhilash Panda (UNISDR); Diego Pedreros (FEWS NET); Pascal Peduzzi (UNEP-GRID and University of Geneva); Giulia Pesaro (Polytechnic University of Milan); Georg Pflug (IIASA); Rui Pinho (GEM, Italy); Jeremy Pittman; Soledad Posada (DARA International); Juan Pujadas (PwC); Byron Quan Luna (NGI); Fernando Ramirez (Corporacion OSSO); Raj Rana (The Wolfgroup); Fabrice Renaud (United Nations University); Hamish Rennie (Lincoln University); Joseph Rizzo (PwC); Cristina Rosales (Corporacion OSSO); Arno Rosemarin (Stockholm Environment Institute); Philippe Rosset (WAPMERR); Laura Rossello (CIMA Foundation); James Rowland (FEWS NET); Roberto Rudari (CIMA Foundation); Keiko Saito (World Bank); Mario Salgado (CIMNE and Associates); Juan Pablo Sarmiento (FIU); John Schneider (Geoscience Australia); Barbara Schwendtner (NGI); Alpesh Shah (PwC); Shri K. Singh (UNAM CIMNE advisor); Francesco Silvestro (CIMA Foundation); Walter Stahel (The Geneva Association for Risk and Insurance Economics); Nicolai Steen (DARA International); Thor Axel Stenström (Stockholm Environment Institute); Jan Sturesson (PwC); Karen Sudmeier-Rieux (University of Lausanne); Megumi Sugimoto (ICHARM); Asa Gerger Swartling (Stockholm Environment Institute); Hiroshi Tagaki (Tokyo Institute of Technology); Tran Thu Tam (Ho Chi Minh City University of Technology); Kannika Thampanishvong (Thailand Development Research Institute); Nguyen Danh Thao (Ho Chi Minh City University of Technology); Andrew Thurley (PwC); Stavros Tolis (WAPMERR); Peeranan Towashiraporn (Asian Disaster Preparedness Centre); Stefania Traverso (CIMA Foundation); Andres Velasquez (Corporacion OSSO); César Velasquez (CIMNE and Associates); James Verdin (FEWS NET); Claudia P. Villegas (CIMNE and Associates); Gregor Vulturius (Stockholm Environment Institute); Scott Williams (PwC); Keith Williges (IIASA); Neville Wright; Max Wyss (WAPMERR); Lilian Yamamoto (United Nations University); Luis Yamin (CIMNE and Associates), Ebrahim Zaghi-

ty (ACSAD), Othon Zevallos (Empresa de Aguas y Alcantarillado de Quito, Ecuador), Paola Zuddas (University of Cagliari, Italy), Daniela Zuloaga (CIMNE and Associates).

2011 – 2013 HFA Progress Review

National progress reports as of 25 March 2013 were submitted by the governments of:

Anguilla, Argentina, Armenia, Australia, Bahrain, Bangladesh, Barbados, Belarus, British Virgin Islands, Bulgaria, Burkina Faso, Cambodia, Canada, Chile, China, Colombia, Comoros, Cook Islands, Croatia, Czech Republic, Djibouti, Dominican Republic, Ecuador, Ethiopia, Fiji, Finland, France, Gambia, Georgia, Germany, Ghana, Greece, Guatemala, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Jordan, Kazakhstan, Kenya, Kiribati, Lebanon, Lesotho, Malawi, Malaysia, Maldives, Marshall Islands, Mauritania, Mauritius, Mexico, Micronesia (Fed. States of), Monaco, Morocco, Myanmar, Nauru, Netherlands, New Zealand, Niger, Niue, Norway, Pakistan, Palau, Palestine (State of), Panama, Papua New Guinea, Peru, Poland, Portugal, Republic of Korea, Romania, Rwanda, Saint Kitts and Nevis, Samoa, Senegal, Serbia, Slovenia, Solomon Islands, Sri Lanka, Sweden, Switzerland, Togo, Tonga, Trinidad and Tobago, Turkey, Turks and Caicos Islands, Tuvalu, Uganda, United Kingdom of Great Britain and Northern Ireland, United Republic of Tanzania, United States of America, Uruguay and Vanuatu.

The HFA Review Process was supported by UNISDR Regional Offices:

- Africa (Pedro Basabe, Youcef Ait-Chellouche and Rhea Katsanakis);
- Americas (Ricardo Mena, Jennifer Guralnick, Raul Salazar and Sandra Amlang);
- Arab States (Amjad Abbashar, Luna Abu-Swaireh, Lars Bernd and Ragy Saro);
- Asia and Pacific (Jerry Velasquez, Madhavi Aryabandu, Hang Thi Thanh Pham, Sujit Mohanty, Glenn Dolcemascolo, Yongkyun Kim, Laura Niskanen and Akapusi Tuifagalele); and
- Europe and Central Asia (Paola Albrito, Stefanie

Dannenmann, Abdurahim Muhidov and Gulsara Pulatova).

And by the UNISDR Information Management Unit (Craig Duncan, Joel Margate, Revati Mani Badola and John Ravi Hayag).

National disaster loss data

Bolivia: Vice Ministerio de la Defensa Civil - VIDECL (Carlos Mariaca Ceballos, Omar Pedro Velazco);

Chile: Universidad de Chile (Alejandro León, Carolina Clerc); **Colombia:** Corporación OSSO (Nayibe Jimenez, Cristina Rosales, Yuliana Diaz); **Costa Rica:** Programa Integral de Gestión de Riesgos de Desastres de la Universidad Nacional - PRIGD UNA (Alice Brenes Maykall, David Smith); **Djibouti:** Centre d'Études et de Recherches de Djibouti - CERD (Samatar Abdi Osman, Ahmed Madar); **Ecuador:** Secretaría Nacional de Gestión de Riesgos - SNGR (Dalton Andrade Rodríguez); **El Salvador:** Dirección General del Observatorio Nacional -DGOA, del Ministerio del Medio Ambiente y Recursos Naturales - MARN (Ivonne Jaimes, Tere Isabel Flores); **Ethiopia:** Ministry of Agriculture and World Food Programme – WFP (Animesh Kumar, Workneh Hundessa, Edget Tilahun, Getnet Kebede); **Guatemala:** La Red de Estudios Sociales en Prevención de Desastres - LA RED (Gisela Gellert); **Guyana:** Civil Defence Commission - CDC (Kester Craig, Sherwin Felicien, Salita Pooran); **Honduras:** Instituto Hondureño de Ciencias de la Tierra - IHCIT de la Universidad Nacional Autónoma de Honduras - UAH (Jessica Velásquez, Carmen María Rodríguez, Roberto Antonio Ortiz Nelson Sevilla, Oscar Elvir); **Indonesia:** Indonesian National Board for Disaster Management BNPB (Ridwan Yunus); **Islamic Republic of Iran:** Ministry of Interior and UNDP (Amin Shamseddini, Victoria Kianpour); **Jamaica:** Office for Disaster Preparedness and Emergency Management – ODPEM (Leiska Powell, Anna Tucker, Rashida Green, Sherese Gentles, Sashekia Powell, Fredene Wilson); **Jordan:** Civil Protection (Waleed Al-So'ub); **Kenya:** National Disaster Operations Center (Rhea Katsanakis, Oliver Madara, Isabel Njihia, Faith Langat); **Laos:** National Disaster Management Organization - NDMO, Laos (Sisomvang

Vilayphong, Bouasy Thammasack, Thitiphon Sinsupan, Hang Thi Thanh Pham, Thanongdeth Insisiengmay, Somvath); **Lebanon:** Office of the Prime Minister and UNDP (Nathalie Zaarour, Lama Tabbara, Bilal El-Ghali); **Mali:** Protection Civil du Mali (Mamadou Traore, Diawoye Conte, Aboudra Koungoulba, Savane Foulematou SY); **Mexico:** La Red de Estudios Sociales en Prevención de Desastres - LA RED (Elizabeth Mansilla); **Mozambique:** Instituto Nacional de Gestão de Calamidades -INGC and UNDP (Dulce Chilundo, Eunice Mucache, Antonio Queface); **Nepal:** National Society for Earthquake Technology –NSET (Amod Dixit, Gopi Bashal); **Nicaragua:** Sistema Nacional para la Prevención, Mitigación y Atención de Desastres - SINAPRED (Ana Isabel Izaguirre, Mercedes Martínez, Gisela Guevara, Carlos Olivares, Noé Ubau, Ernesto González); **Orissa:** State Disaster Management Authority (Kalika Mohapatra, Ambika Prasad); **Pacific Islands:** SPC/SOPAC (Jutta May, Nicole Daniels, Litea Biukoto); **Panamá:** Sistema Nacional de Protección Civil – SINAPROC (Eric Reyes, Kenat Saarim Camaño Guerra); **Perú:** Centro de Estudios de Prevención de Desastres - PREDES (José Sato Onuma, Alfonso Diaz Calero, Julio Meneses Bautista, Yeselín Díaz Toribio, Ingrid Azaña Saldaña); **Sri Lanka:** Ministry of Disaster Management (Dinesh Rajapaksha); **Syrian Arab Republic:** Ministry of Local Administration (Kinda Muhana, Claude Amer); **Timor Leste** National Disaster Operation Centre – NDOC, Ministry of Social Solidarity (Lourenco Cosme Xavier, Maarten Visser); **Uganda:** Office of the Prime Minister, Department of Disaster Preparedness and Management (Samuel Akera, Charles Odok); Uruguay: Sistema Nacional de Emergencias de la Presidencia de la República – SINAЕ (Virginia Fernandez, Sabrina Pose, Soledad Camacho, Ana Maria Games, Pablo Capurro); **Venezuela:** Dirección Nacional de Protección Civil y Administración de Desastres – DNPCAD (Jairo Sanchez, José Scire); **Vietnam:** Ministry of Agriculture and Rural Development and UNDP (Ian Wilderspin, Miguel Coulier, Oanh Luong Nhu, Nguyen Thi Thu Thuy); **Yemen:** Ministry of Environment (Majed Alrefai).

The updating and compilation of disaster loss data was coordinated in Latin America by Raul Salazar and Ricardo Mena (UNISDR LAC) in close collaboration with Mauricio Bautista, Jhon Henry Caicedo, Maria Isabel Cardona, Natalia Diaz, Nayibe Jimenez, Cristina Rosales, Alexander Torres and Andres Velasquez (Corporacion OSSO, Colombia); in Asia and Africa by Julio Serje (UNISDR) in collaboration with Luna Abu-Swaireh (UNISDR Arab States) and Rhea Katsanakis (UNISDR Africa); in Asia Sanny Jegillos and Rajesh Sharma (UNDP, Regional Centre Bangkok) and in the Pacific Jutta May and Nicole Daniels (SPC/SOPAC).

Peer reviewers

Scientific peer review of the global hazard models were coordinated by WMO (drought, flood and tropical cyclone, led by Maryam Golnaragh) and UNESCO (earthquake, tsunami and landslides, led by Alexandros Makarigakis and coordinated by Kristine Tovmasyan).

Reviewers: Irasema Alcantara-Ayal (UNAM, Mexico), Zeljko Arbanas (University of Rijeka, Croatia) Jörn Behrens (Alfred Wegener Institute for Polar and Marine Research, Germany), Antônio Cardoso Neto (Agência Nacional de Aguas (ANA), Brazil), Timothy A. Cohn (U.S. Geological Survey), Johannes Cullmann (Federal Institute of Hydrology, Germany), Russel Elesberry (Naval Postgraduate School, USA), Mihail Garevski (Institute of Earthquake Engineering and Engineering Seismology, Former Yugoslav Republic of Macedonia), Mohsen Ghafory-Ashtiani (International Institute of Earthquake Engineering and Seismology, Iran), Wolfgang Grabs (WMO), Kazuyoshi Kudo (Nihon University, Japan), Koji Kuroiwa (WMO), Brad Garanganga (SADC, Botswana), Bruce Harper (GHD, Australia), Rami Hofstetter (Seismology Division Geophysical Institute of Israel), Christopher Oludhe (University of Nairobi, Kenya), Kyoji Sassa (University of Kyoto, Japan), Kenji Satake (University of Tokyo, Japan), Yuri Simonov (State Hydrological Institute, Russia), Robert Stefanski (WMO), Alexander Strom (Geodynamics Research Center, Russia), Stefano Tinti (University of Bologna, Italy),

Fawu Wang (Graduate School of Shimane University, Japan), Donald A. Wilhite, (University of Nebraska, USA), Liu Zhiyu (Bureau of Hydrology, Ministry of Water Resources of China). Additional reviews of the global risk modelling were provided by Geoscience Australia (John Schneider, Nick Horspool, Tariq Maqsood and Andrew Jones) and by Risk Management Solutions (Robert Muir-Wood).

Review comments on the Zero Order Draft were received from: Yoshiko Abe (Kokusai Kogyo Co. Ltd., Japan); Irasema Alcantara-Ayala (Universidad Nacional Autonoma de México); Dilanthi Amaratunga (University of Salford, United Kingdom); Adel Bear-Crozier (GeoSciences Australia); Djillali Benouar (University of Bab Ezzouar , Algeria); Charlotte Benson (Asian Development Bank); David Bresch (Swiss Re, Switzerland); Sálvano Briceño (IRDR); Christopher Burton (Global Earthquake Model, Italy); Chen Liu Shaw (Academia Sinica, Taiwan); Susan Cutter (University of South Carolina, USA); Glenn Dolcemascolo (UNISDR); Rowan Douglas (Willis Re); Elizabeth Ferris (Brookings Institution); Vincent Fung (UNISDR); Dirk Glaesser (UNWTO); Peter Gubbels (Groundswell International); Stephane Hallegatte (World Bank); Debbie Hillier (Oxfam, United Kingdom); Demetrio Innocenti (UNISDR); Nicole Keller (Global Earthquake Model, Italy); Kaushal Keraminiyage (University of Salford); Daniel Kull (World Bank); Abinash Lakhar (Indian Institute for Human Settlements, India); Bernard Laporte (AXA Matrix Risk Consultants); Allan Lavell (FLACSO); Elizabeth Longworth (UNISDR); Darío Luna Plá (Government of Mexico); Tariq Maqsood (GeoSciences Australia); David Maréchal (Allianz Re); Neil McFarlane (UNISDR); Matthew McKinnon (DARA International); James McLean (Kokusai Kogyo Co. , Ldt., Japan); Calvin Miller (FAO); Sujit Mohanty (UNISDR); Robert Muir-Wood (RMS, United Kingdom); Lee Müller (Swiss Re, Switzerland); Pablo Munoz (IHPD, United Nations University); Virginia Murray (IRDR); Jaroslav Mysiak (FEEM); Bettina Ngwenya (Aga Khan University, Kenya); Richard Olson (Florida International University, USA); Aris Papadopoulos (Titan America); Dennis Parker (Flood Hazard Research Centre, United Kingdom);

Chaminda Pathirage (Salford University, United Kingdom); Patrick Pigeon (Université Savoie); Sally Priest (Flood Hazard Research Centre, United Kingdom) Alasdair Ross (Economist Intelligence Unit); Jane Rovins (IRDR); Tarek Sadek (ESCWA, Lebanon); Paul Samuels (HR Wallingford Ltd., United Kingdom); David Sarabacha (Deloitte); Rachel Scott (OECD); Alanna Simpson (World Bank); David A. Smith Wiltshire (National University of Costa Rica); Zuzana Stanton-Gedde (World Bank); Swenja Surminski (London School of Economics, United Kingdom); Régis Thepot (Seine Grands Lacs, Etablissement Public Territorial de Bassin); Anna Timonina (IIASA, Austria); John Tobin (Crédit Suisse, Switzerland); German Velasquez (UNISDR); Eva Wuttge (GIZ).

Special acknowledgement for advice received from: Yvo de Boer (KPMG) and Professor John Urry (Lancaster University).

Design Concept

Earth Literacy Program (NPO)

Design and production (printed GAR)

Design concept, cover and style guide: Mitsuhiro Miyazaki and Masashi Tomura (AXIS), Shin'ichi Takemura (Earth Literacy Programme – ELP), Taku Satoh (Taku Satoh Design Office); **Inverted umbrella symbol:** Taku Satoh and Shin'ichi Takemura, inspired by the work of Makoto Murase and the Institute on Sky Water Harvesting; **Design realisation:** Mitsuhiro Miyazaki and Masashi Tomura (AXIS), Shin'ichi Takemura (ELP); **Layout:** Takae Ooka;

Maps and graphs: Manuela di Mauro, Sylvain Ponserre and Julio Serje (UNISDR), David Lazarus (Mtn. Design) and Stephane Kluser (UNDP); **Editing:** Martha Bonilla; **Printing:** Imprimerie Nouvelle Gonnet; **Production Coordination:** David d'Heilly (2dk/ELP) and Frederic Delpech (UNISDR); **Procurement:** UNOPS, Bangkok.

Tangible Earth (TE) and GAR for Tablet (GfT)

TE platform design and GfT scenario development: Shin'ichi Takemura; **TE systems architecture:**

Takahiro Shinkai; **GfT systems architecture:** Jun Nishimura; **GfT scenario development:** Yoshiyuki Inaba; David d'Heilly; **Production management:** Kensuke Arakawa; **Case studies for GfT:** Vincent Fung, Sylvain Ponserre and Vicente Anzellini (UNISDR); **GfT interface design:** Takuro Okuyama, Kensuke Arakawa; **International research and facilitation:** David d'Heilly; **General administration:** Shoko Takemura.

On-line GAR

Julio Serje, Sylvain Ponserre, Joel Margate and Andris Valums (UNISDR).

Resources

Financial resources were provided by the Governments of Australia, Japan, Norway and the United States of America and by the European Commission (DG ECHO and DG Development). Other in-kind resources were provided by FEWSNET, Florida International University, Geneva Association for Risk and Insurance Economics, PricewaterhouseCoopers, Save the Children International, UNDP and the World Bank.

