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Hazard Risk Reduction and Adaptation
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Deliverable 2.2
Report on issues, gaps and opportunities, network coverage

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

The central aim of the Catalyst project is to enhance capacity to cope with natural hazards and disaster risk. To this end, it brings together the scientists, stakeholders and networks to identify and share the best of knowledge, know-how and practices in this area. The deliverable 2.2 offers early insights into the specific vulnerabilities of the four geographic sub-regions on which the project focuses, and introduces the stakeholders who agreed to collaborate with the project.

The Catalyst project focuses on four geographic sub-regions, each characterized by a unique pattern of risk and vulnerability: Central America and Caribbean (CAC), West and East Africa (WA, EA), South and South-East Asia (SEA), and European Mediterranean (EM) regions. The choice of the stakeholders' organisations and networks has been discussed in the deliverable 2.1. Some 54 individuals from international organisations, SMEs, governmental organisation, academy and civil society organisation have committed to work closely with the Catalyst consortium in designing the capacity development/enhancement activities of the project. According to UNISDR, capacity development/enhancement is the process by which people, organizations and society systematically stimulate and develop their capacities over time to achieve social and economic goals, including through improvement of knowledge, skills, systems, and institutions1.

A preliminary description of the sub-regional patterns of vulnerability can be provided by the Disaster Risk Index, used by the UNDP in order to identify countries in highest need for prevention and development. The index enables the calculation of the average risk of death per country in large- and medium-scale disasters associated with earthquakes, tropical cyclones and floods. Data elaboration covers the period from 1980 to 2000. It also permits the identification of a number of socio-economic and environmental variables that are correlated with risk to death and which may point to causal processes of disaster risk.

The initial vulnerability assessment of the Catalyst sub-regions is based on the series of global assessment reports from which we have selected the most important ones:

a) IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: Summary for Policymakers;

b) Human Development Report 2011: Sustainability and Equity: A Better Future for All;

c) 2011 Millennium Development Goals Report;

d) Hyogo Framework for Action 2005-2015. Mid-Term Review.

Deliverable 2.2 also gives place to CATALYST stakeholders' valued opinions and considerations on the topics addressed by the project. Extensive consultations took place with them, in order to better understand the capacity enhancement activities provided by their organization and the possible synergies with the project. They were also asked to provide their views on what they identify as the knowledge gaps preventing a more efficient deployment of DRR strategies, and opportunities holding promises for improved disaster management practice in their respective sub-regions.

[1] UNISDR terminology on disaster risk reduction, http://www.unisdr.org/files/7817_UNISDRTerminologyEnglish.pdf

1 CHARACTERIZATION OF THE VULNERABILITY AND RISK PATTERNS OF THE CATALYST SUB-REGIONS

1.1 Introduction

The initial vulnerability assessment of the Catalyst sub-regions is based on the series of global assessment reports from which we have selected the following ones:

a) IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: Summary for Policymakers

The Special Report for Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation (SREX) was approved by the Intergovernmental Panel on Climate Change (IPCC) on 18 November 2011 in Kampala, Uganda. It addresses how integrating expertise in climate science, disaster risk management and adaptation can inform discussions on how to reduce and manage the risks of extreme events and disasters in a changing climate. The report evaluates the role of climate change in altering the frequency and severity of extreme events. It assesses experience with a wide range of options used by institutions, organizations and communities to reduce exposure and vulnerability, and improve resilience to climate extremes. Among these are early-warning systems, innovations in insurance coverage, improvements in infrastructure and the expansion of social safety nets. Overall, the report's emphasis is on the factors that make people vulnerable to extreme events, on recent and possible future changes in climate extremes, on approaches for managing the risks of disasters, and on the implications for sustainable development. SREX also incorporates case studies that illustrate specific extreme events and their impacts in different parts of the world, as well as a range of risk management activities.

b) Human Development Report 2011: Sustainability and Equity: A Better Future for All

The 2011 Human Development Report focuses on the challenge of sustainable and equitable progress. A joint lens shows how environmental degradation intensifies inequality through adverse impacts on already disadvantaged people and how inequalities in human development amplify environmental degradation. Arguing that the urgent global challenges of sustainability and equity must be addressed together, it identifies policies on the national and global level that could spur mutually reinforcing progress towards these interlinked goals.

The Report shows further how the world's most disadvantaged people suffer the most from environmental degradation, and disproportionately lack political power, making it all the harder for the world community to reach agreement on needed global policy changes. Even though in the last decades living standards in most countries have been rising and converging, the 2011 Report projects a disturbing reversal of those trends if environmental deterioration and social inequalities continue to intensify, with the least developed countries diverging downwards from global patterns of progress by 2050. Nevertheless, the report ascertains great potential for positive synergies in the quest for greater equality and sustainability, especially at the national level. The Report further emphasizes the human right to a healthy environment, the importance of integrating social equity into environmental policies, and the critical importance of public participation and official accountability. It concludes with a call for bold new approaches to global development financing and environmental controls, arguing that these measures are both essential and feasible.

c) 2011 Millennium Development Goals Report

The Millennium Development Goals (MDGs) are eight targeted development aims designed to free humanity from extreme poverty, hunger, illiteracy and disease by 2015. Together,

they form a blueprint for development agreed upon by all the world's countries and world's leading development institutions.

The Statistics Division of the United Nations - Department of Economic and Social Affairs annually coordinates and publishes the "Millennium Development goals Report", which represents the most comprehensive global assessment of progress to date, based on data provided by a large number of international organizations within and outside the United Nations system. The aggregate figures in the report provide an overview of regional progress under the eight goals and are a convenient way to track advances over time. Moreover, the reliable, timely and internationally comparable data on the MDG progress indicators provided by the report are crucial for holding the international community to account, encouraging public support and funding for development, allocating aid effectively, and comparing progress among regions and across countries.

The 2011 Report outlines the significant progress made by some countries towards the MDGs, but also demonstrates that efforts to reach the MDGs by 2015 still need to be intensified. They must address disparities in progress between urban and rural areas, and increase efforts to target the world's hardest to reach populations, namely the extremely poor and those disadvantaged due to their sex, age, ethnicity or disability. Other challenges include promoting sustainable development and protecting the most vulnerable from the devastating effects of multiple crises – whether conflicts, natural disasters or volatility in prices for food and energy.

d) Hyogo Framework for Action 2005-2015. Mid-Term Review

During the 2005 World Conference on Disaster Reduction (WCDR), held in Kobe/Hyogo (Japan), some 168 States endorsed the Hyogo Framework for Action 2005-2015 (HFA), a 10-year plan for disaster risk reduction efforts. The HFA is expected to deliver by 2015 a substantial reduction in disaster losses, in terms of lives as well as in terms of the social, economic and environmental assets of communities and countries The Framework provides guiding principles, priorities for action, and practical means for achieving disaster resilience. The identified priorities for action include 1) ensuring that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; 2) identifying, assessing and monitoring disaster risks and enhancing early warning capacities 3) using knowledge, innovation and education to build a culture of safety and resilience at all levels; 4) reducing the underlying risk factors; 5) strengthening disaster preparedness for effective response at all levels.

The mid-term report presents the findings of the Mid-Term Review of the Hyogo Framework for Action (HFA), analysing the extent to which HFA implementation has progressed and helping countries and their institutional partners to identify practical measures to increase commitment, resourcing, and efforts in its further implementation. The report highlights the significant progress that has been made over the past five years in disaster risk reduction and the fact that the adoption of the Hyogo Framework for Action in 2005 has played a decisive role in promoting this progress across international, regional, and national agendas.

HFA implementation at local level is a point highlighted throughout the Mid-Term Review and encompasses issues such as decentralizing authority, empowering local communities and creating a social demand for disaster risk reduction so that individuals realize their own share of responsibility in increasing their resilience and in holding governments accountable for the development and implementation of coherent disaster risk reduction plans and investments. The final sections of the report outline critical elements needed to enhance implementation of the HFA through 2015.

1.2 The Catalyst sub-regions in brief

The Catalyst project focuses on four geographic sub-regions, each characterized by a unique pattern of risk and vulnerability: Central America and Caribbean (CAC), West and East Africa (WA, EA), South and South-East Asia (SEA), and European Mediterranean (EM) regions (Figure 1, Table 1). Our analysis is based on the UN Statistics sub-division of the countries in the regions and sub-regions.

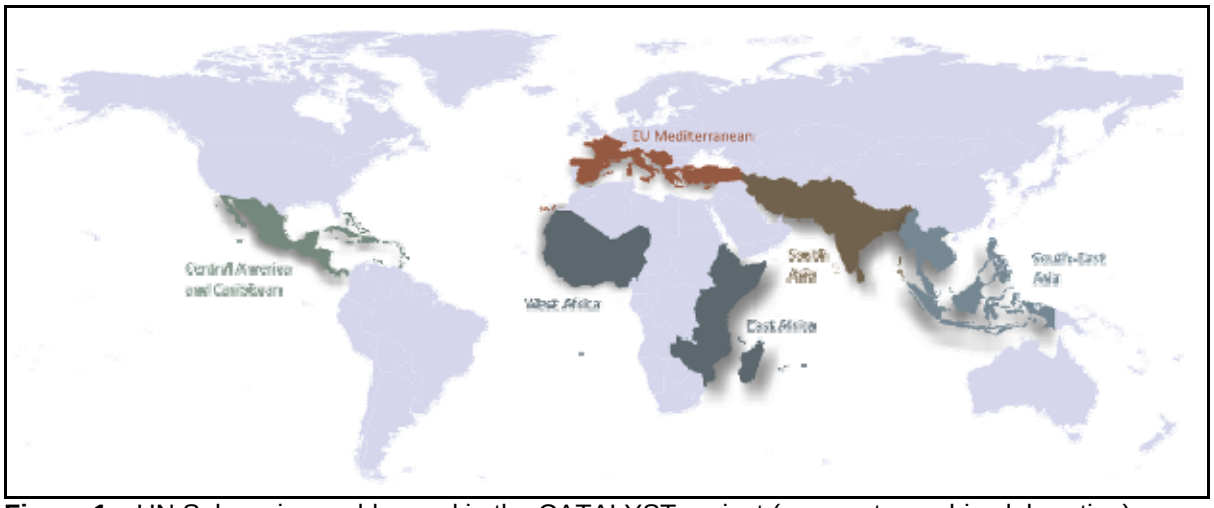


Figure 1: UN Sub-regions addressed in the CATALYST project (own cartographic elaboration).

The countries included in East Africa (EA) are Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Mayotte, Mozambique, Réunion, Rwanda, Seychelles, Somalia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe (Figure 2 left). Western Africa (WA) includes Benin, Burkina Faso, Cape Verde, Cote d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Saint Helena, Senegal, Sierra Leone, Togo (Figure 2 right).

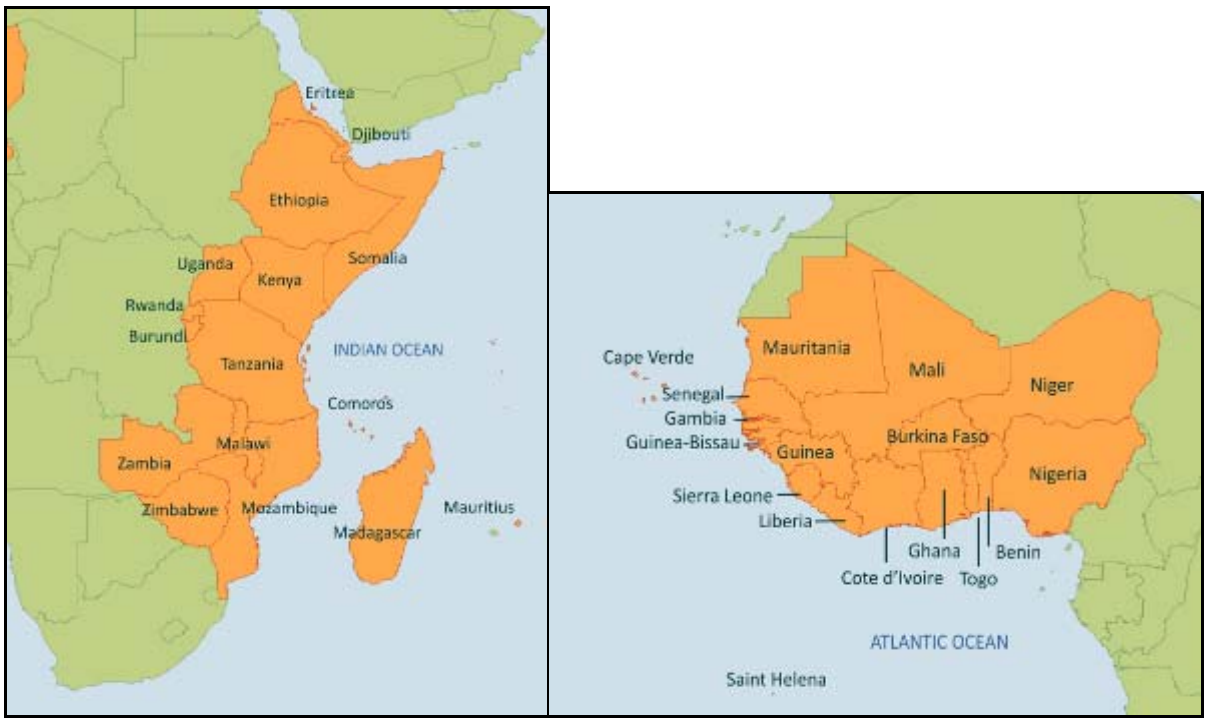


Figure 2: East (left) and West (right) Africa according to the UN Statistics Division (own cartographic elaboration).

Central America includes Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama. Caribbean includes Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Bonaire, Saint Eustatius and Saba, British Virgin Islands, Cayman Islands, Cuba, Curaçao, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Jamaica, Martinique, Montserrat, Puerto Rico, Saint-Barthélemy, Saint Kitts and Nevis, Saint Lucia, Saint Martin (French part), Saint Vincent and the Grenadines, Sint Maarten (Dutch part), Trinidad and Tobago, Turks and Caicos Islands, United States Virgin Islands.

Figure 3: Central America and Caribbean according to the UN Statistics Division (own cartographic elaboration).

South Asia includes Afghanistan, Bangladesh, Bhutan, India, Iran (Islamic Republic of), Maldives, Nepal, Pakistan, and Sri Lanka. South-East Asia consist of Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste, Viet Nam.

Figure 4: South Asia according to the UN Statistics Division (own cartographic elaboration).

Figure 5: South-East Asia according to the UN Statistics Division (own cartographic elaboration).

The table below provides a preliminary view on the basic physical and socio-economic characteristics of the sub-regions addressed by Catalyst.

Table 1: Key characteristics of the four geographic sub-regions: CAC – Central America and Caribbean, EU MED – European Mediterranean, WA – West Africa, EA – East Africa, SA – South Asia, SEA – South-East Asia (Source: UN Statistical Division and the World Bank, http://data.worldbank.org/ .*in 2009 value of US dollars)

UN sub-region	CAC	EU MED	WA	EA	SA	SEA
Number of countries	39	10	17	19	9	11
Population (millions)	197,5	155,2	304,3	324,0	1764,9	593,4
Surface area (Km2)	2.714	1.317	6.138	6.361	10.791	4.495
GDP per capita*	6658	28420	906	502	1162	2528

2 CHOICE OF THE THINK TANK MEMBERS

The choice of the organisations and networks to be involved in CATALYST has been conducted taking into consideration several aspects. The potential impact these organizations and network can have, is one pre-eminent element which has been considered. The chosen organisations and networks provide the highest leverage for the CATALYST activities, enabling us to reach high number of local administration, institutions and local citizens benefiting from the content developed.

The potential synergies of the stakeholder's activities with those provided by CATALYST has also been regarded. In this way, the modest resources of the project are spent in a more cost-efficient and effective way.

Moreover, previous collaboration and established partnership has played an important role in the choice of the stakeholders, together with the commitment to collaborate throughout the project and beyond: Critical for the success of the CATALYST project is the commitment to fully cooperate with the project consortium.

Table 2: Core Think Tank Members across the different geographic sub-regions, and typology of organisation (NGO – nongovernmental organisation, IO – international organisation, A – academic, NP – policy, national or regional; SME – small and medium-sized enterprise

SUB-REGION	NGO	IO	A	NP	SME	TOTAL
Central America and Caribbean	3	1	6	2	1	**13**
South and South-East Asia	4	5	3	1	0	**13**
West and East Africa	4	5	7	0	1	**17**
European Mediterranean	1	0	8	0	2	**11**
Total	**12**	**11**	**24**	**3**	**4**	**54**
per cents	***22.2***	***20.4***	***44.4***	***5.6***	***7.4***	

3 PATTERN OF VULNERABILITY – AN INITIAL DESCRIPTION

3.1 Introduction

Vulnerability measurement is of great interest in sustainable development and global change research communities. The word "vulnerability" has been defined in many different ways, probably the most ordinary use of it refers to the degree to which a system is susceptible to and is unable to cope with adverse effects (of climate change) (McCarthy et al, 2001). Although several studies have been performed in the last years, assessing vulnerability is still a challenging exercise. Numerous frameworks, vulnerability assessment methodologies and conceptual models have been developed for theoretical foundations and practical applications (Adger, 2006; Cutter et al., 2008; Füssel, 2006; Polsky et al., 2007). Almost thirty years ago Timmermann (1981) wrote that vulnerability is a term of such broad use as to be almost useless for an accurate description of the present. It has often been equated to other concepts like susceptibility, fragility, risk, marginality (Liverman, 1990); also exposure, sensitivity, criticality, resilience, coping capacity, adaptability have all been related or equated to vulnerability (Füssel, 2009). Also nowadays, Hinkel (2010) affirms that speaking of measuring vulnerability is misleading, as this is impossible and raises false expectations.

Notwithstanding, measurement of vulnerability is essential both at national and international level to prioritise adaptation resources and funding. Despite differences in terminology of vulnerable concepts and nomenclature of vulnerable situations, all approaches share the socio-ecologic perspective and the use of vulnerability assessment to identify risk and hazard for the development of mitigation and risk reduction strategies (Cutter et al., 2008). Biophysical, human ecology, political economy and political ecology are contextual conditions necessary to define human vulnerability to environmental change (McLaughlin et al., 2008).

Aggregated vulnerability indices produced using those approaches can be divided in two streams: theory-driven and data-driven (Füssel, 2009). Theory-driven are based on conceptual frameworks to define relevant criteria, whereas data-driven methods identify criteria based on their statistical relationship with vulnerability outcomes (Füssel, 2009). Both methods make extensive use of socio-economic, environmental and building environment observed data, as well as model-based estimated future scenarios. According to Füssel (2009), at the moment all existing indices of vulnerability to climate change show empirical, conceptual and procedural weaknesses, as well as lack of robustness, large sensitivity to data aggregation and limited data availability. As a result of these limitations, different indexes show little agreement in the global distribution of vulnerability.

As examples of aggregate indices we offer the following three: The 2005 Environmental Sustainability Index (ESI) was developed by the Yale Centre for Environmental Law and Policy and the Centre for International Earth Science Information Network of Columbia University. ESI ranks 146 countries and territories on elements of environmental sustainability covering natural resource endowments, past and present pollution levels, environmental management efforts, contributions to protection of the global commons, and a society's capacity to improve its environmental performance over time. The dataset contains 103 variables: one composite index (the ESI), five component indicators (environmental systems, reducing environmental stress, reducing human vulnerability, social and institutional capacity, and global stewardship), 21 indicators used to calculate the component indicators, and 76 raw-data variables used to calculate the 21 indicators.

For the purpose of this document, the Human Vulnerability Component of ESI is presented as a national-level index of social vulnerability to natural hazards.

The Environmental Vulnerability Index (EVI) has been developed by the South Pacific Applied Geoscience Commission (SOPAC), the United Nations Environment Programme (UNEP) and their partners. It assesses environmental vulnerability, defined as the risk of damage to health of the ecosystems, at the national level. The EVI considers 50 normalized

indicators that represent the risk of hazards occurring, the inherent resistance to damage and the acquired vulnerability resulting from past damage. The EVI has been designed to reflect the extent to which the natural environment of a country is prone to damage and degradation: in this sense, it is not aimed at addressing the vulnerability of the social, cultural or economic environments. The environment at risk includes ecosystems, habitats, populations and communities of organisms, physical and biological processes, productivity and energy flows, diversity at all levels, and interactions among them all. Each of these ecosystem goods, services and relationships may be affected by natural and human hazards, the risk of which may vary with time, place and human choices and behaviour.

The Disaster Risk Index (DRI) is used by the UNDP in order to identify countries in highest need for prevention and development. The index enables the calculation of the average risk of death per country in large- and medium-scale disasters associated with earthquakes, tropical cyclones and floods. Data elaboration covers the period from 1980 to 2000. It also permits the identification of a number of socio-economic and environmental variables that are correlated with risk to death and which may point to causal processes of disaster risk. The DRI represents the risk of death, using it as a proxy for manifest risk : this choice can appear restrictive, given that disasters affect people's lives and livelihoods in many ways, both in the social and economic field. However, it was due to a lack of reliable data on other aspects of disaster risk (people affected, economic impact), which is not available at the global scale with national resolution.

In the DRI, countries are indexed for each hazard type according to their degree of physical exposure, their degree of relative vulnerability and their degree of risk.

Figure 6: Disaster Risk Index (DRI) (Peduzzi et al., 2009) of CAC countries (own cartographic elaboration).

Figure 7: Environmental Vulnerability Index (EVI) of CAC countries (own cartographic elaboration).

Figure 8: Disaster Risk Index (DRI) (Peduzzi et al., 2009) of WA countries (own cartographic elaboration)

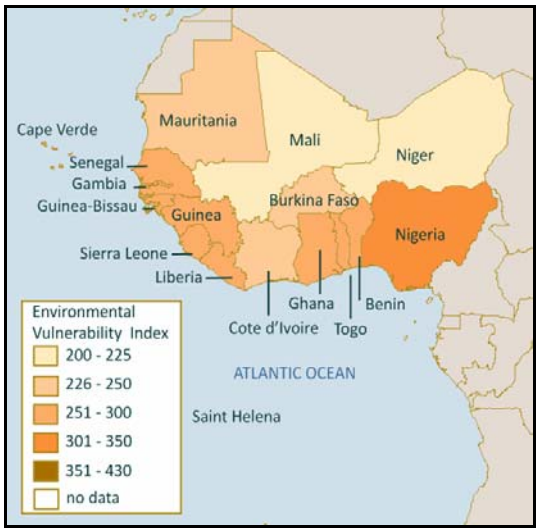


Figure 9: Environmental Vulnerability Index (EVI) of WA countries (own cartographic elaboration)

Figure 10: Disaster Risk Index (DRI) (Peduzzi et al., 2009) of EA countries (own cartographic elaboration).

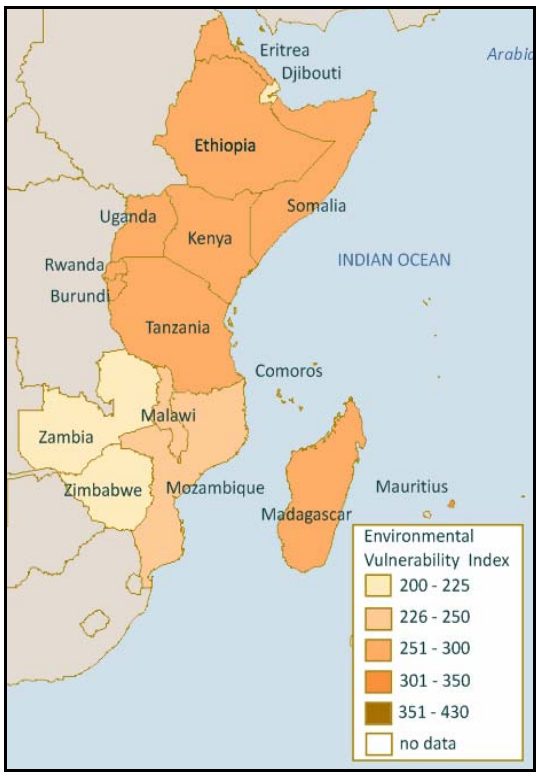


Figure 11: Environmental Vulnerability Index (EVI) of EA countries (own cartographic elaboration)

Figure 12: Disaster Risk Index (DRI) (Peduzzi et al., 2009) of SA countries (own cartographic elaboration).

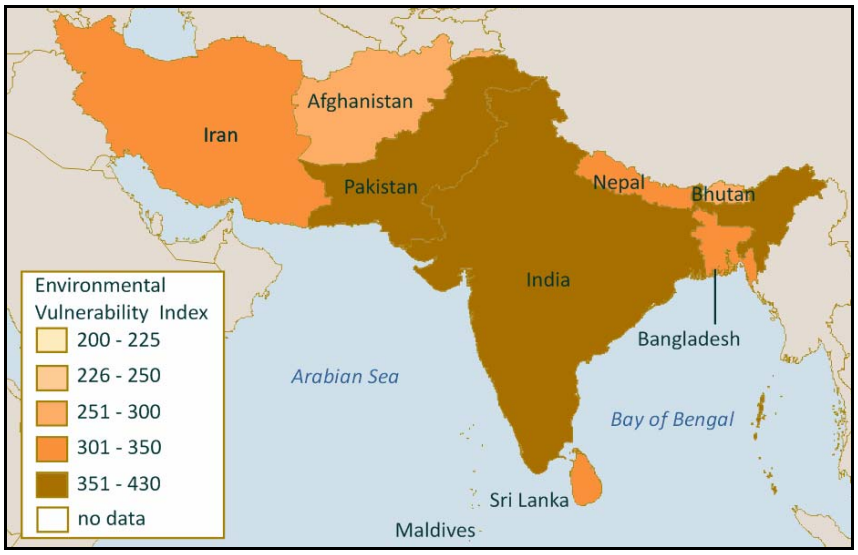


Figure 13: Environmental Vulnerability Index (EVI) of SA countries (own cartographic elaboration).

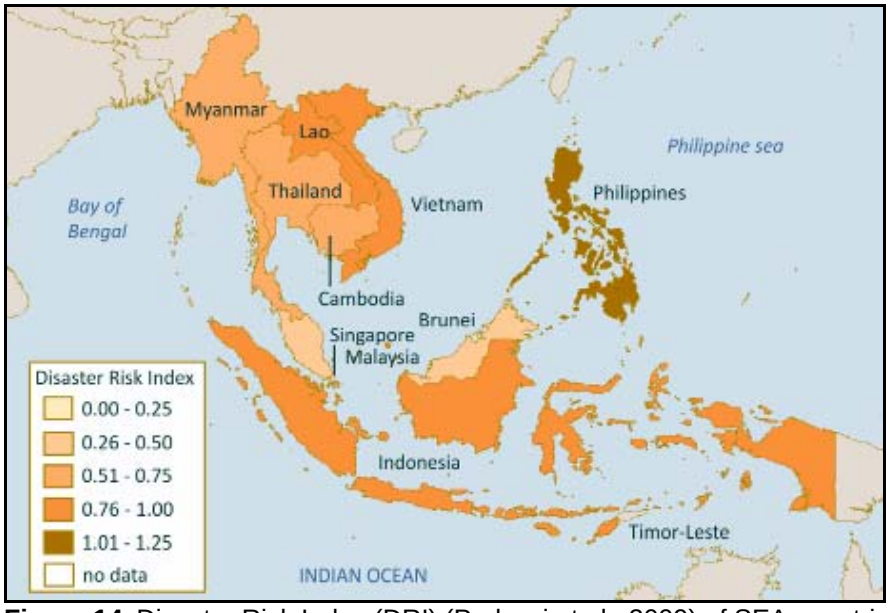


Figure 14: Disaster Risk Index (DRI) (Peduzzi et al., 2009) of SEA countries (own cartographic elaboration).

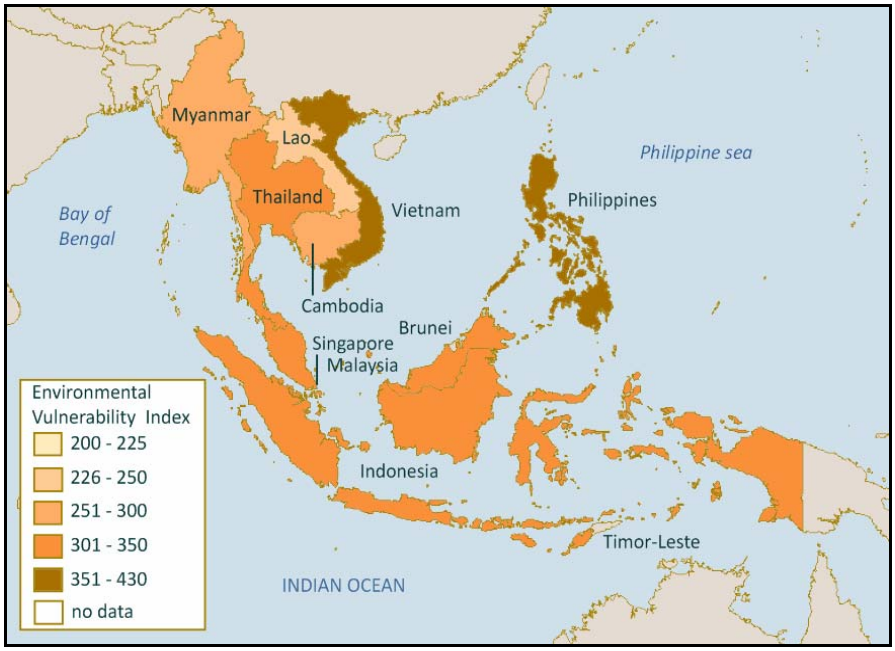


Figure 15: Environmental Vulnerability Index (EVI) of SEA countries (own cartographic elaboration).

3.2 Hazard exposure

Over the past decades, the world witnessed a striking increase in the economic losses caused by natural disasters. While in principle natural hazards cannot be prevented, their impacts can be moderated if not avoided. It is well established that rising population and economic growth are the major drivers in the trend of the observed losses. In the coming decades, anthropogenic climate change will very likely lead to more frequent and intense meteorological and climate extreme events and thus further amplify the disaster losses, if no preventive actions are taken. Disaster risk management addresses several global changes at the same time: First, it reduces the harm caused by natural disasters, and increase the ability of societies to respond, recover and develop. Second, it is vital for designing preventive measures to adapt to a changing climate.

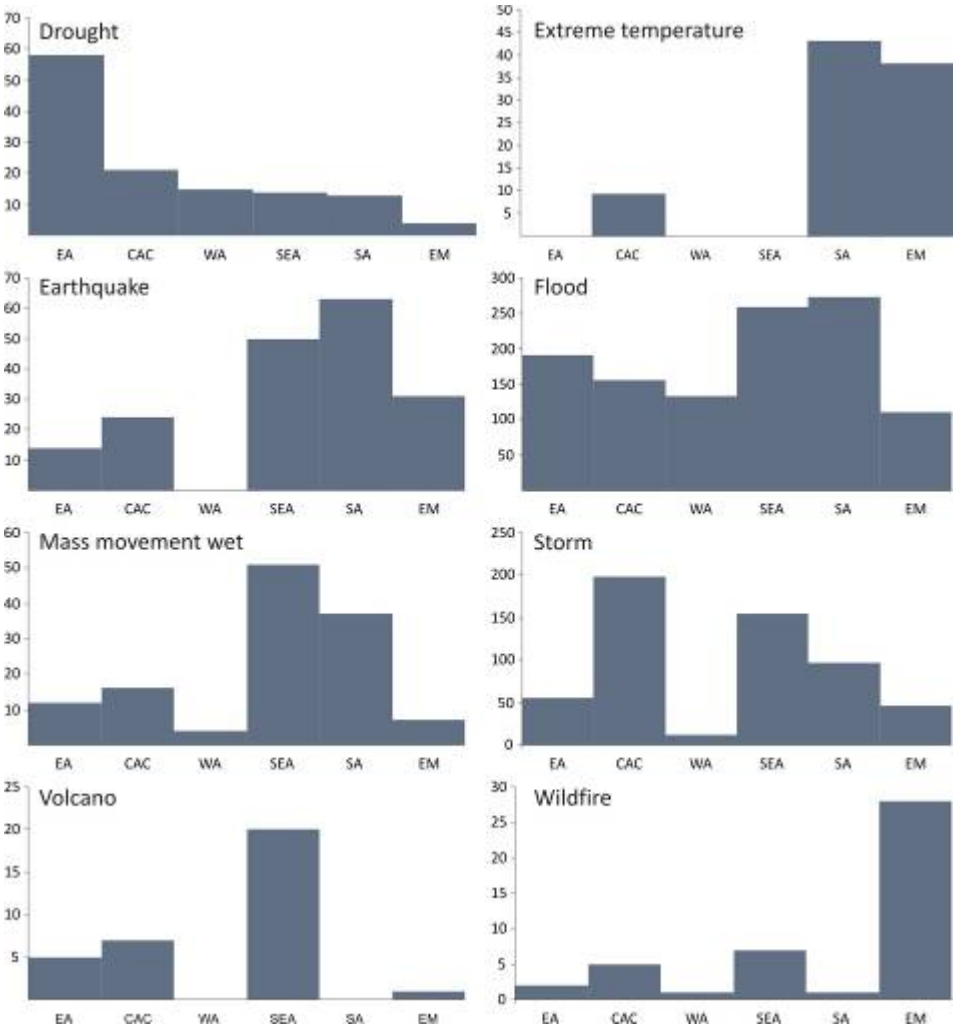


Figure 16: Number of disasters by category and geographic sub-region, based on EM-DAT (own elaboration)

Figure 16 shows the pattern of significant disaster events experienced in the different sub-regions over the past ten years. It is apparent that East Africa is particularly prone to drought and floods, whereas Western Africa has to cope with floods more frequently than with droughts. On the other hand drought (and wildfire) do not seem to be the most important disaster types in South and South-East Asia, both of which however are plagued by almost all other natural hazards. Central America and Caribbean on the other hand seems to be prone to significant storm and flood damage but perhaps better equipped to cope with the other natural disasters.

Table 3: Number of significant disasters of different categories that have plagued the different geographic sub-regions over the period 2000-2010, based on EM-DAT (own elaboration)

	Drought	Extreme temperature	Earthquake	Flood	Mass movement wet	Storm	Volcano	Wildfire
East Africa	58	-	14	191	12	56	5	2
Central America and Caribbean	21	9	24	155	16	198	7	5
West Africa	15	1	-	133	4	12	-	1
South East Asia	14	-	50	259	51	155	20	7
South Asia	13	43	63	273	37	97	-	1
European Mediterranean	4	38	31	110	-	46	1	28

Table 4: Reported economic losses and size of affected population as a result of significant disasters of different categories that have plagued the different geographic sub-regions over the period 2000-2010, based on EM-DAT (own elaboration)

Region	Drought	Earthquake	Extreme temperature	Flood	Mass movement wet	Storm	Volcano	Wildfire
Economic losses ('000 US$ current prices)								
EA	0	230	0	1,070	0	689	0	0
CAC	383	11,415	0	3,547	500	37,244	0	0
WA	0	0	0	234	0	0	0	0
SA	5,045	13,087	400	32,410	68	4,620	0	0
SEA	704	12,834	0	6,793	124	9,967	4.8	14
Affected population (mil)								
EA	129.6	0.1	0	16.0	0.02	4.5	0.29	0.03
CAC	3.8	5.7	0.1	5.9	0.06	18.8	0.05	0.02
WA	17,9	0	0	6.6	0.01	0.02	0	0.01
SA	24.8	7.9	0	57.3	0.8	64	0.6	0.01
SEA	397.2	15.9	0.7	356.2	0.7	22	0	0

3.3 Susceptibility to harm

Vulnerability is generally defined as any condition of susceptibility to external shocks that could threaten people's lives and livelihoods, natural resources, properties and infrastructure, economic productivity, and a region's prosperity. In this context, a hazard is the probability that a natural or human induced phenomena will occur. Uncertainty in the occurrence of natural hazards is large and contributes to environmental and social vulnerability. This section will discuss factors that explain environmental vulnerability to natural hazards across several regions: West and East Africa, South and South-East Asia, Central America and Caribbean countries. In order to conduct this analysis, some relevant indicators of susceptibility to harm have been chosen and elaborated. Table 5 provide a list of the chosen indicators and their basic statistics at aggregated level, while Figure 17 shows the same indicators disaggregated for the different sub-regions.

In this section and the following one, an analysis for the European Mediterranean sub-region will not be offered. This choice is due to the consideration that representing European countries together with developing countries could distort the comparison among the different sub-regions, being Europe characterized by very specific and complex patterns in the field of NH/DRR.

West and East Africa

Agricultural land use provides food for people and livestock. On average in East Africa the total land use for agricultural purposes is greater than in West Africa, however, a high percentage of its land is not entirely or limitedly used. Therefore, its agriculture value added as percentage of GDP is lower than in West Africa. There are areas in West Africa where agriculture contributes up to 60% of the GDP. Population density is low (50 people/sq km) in the western region compared to the East, where its density varies from 50 to 300 people/sq km. Also, there are areas in East Africa where the population density significantly increases

making the areas densely populated and the transport development linkages of great significance. On average most of the urban population in West and East Africa live in the largest city (average rates vary from 35% to 50%), having East Africa percentage increase up to 65%, while in West Africa there are cases where only 10% of the urban population is living in the largest city. In West Africa up to 30% of the urban population live in cities whose population exceed 1 million but this is not the case in East Africa, whose average rate is around 7%. Also, on average a low percentage of land use area where elevation is below 5 meters is reported, as there is a low percentage of population living in these areas. Furthermore, people use natural resources to exploit water resources for multiple purposes and to protect areas for conservation and preservation. Thus, regarding the annual freshwater withdrawals which account for almost 15% of the internal resources in both regions of Africa, they are mainly used for agriculture purposes and domestic use and less for industry in both regions of Africa. Moreover, the amount of renewable internal freshwater resources is low in Africa (almost 100 billion cubic meters), with West Africa having higher percentage per capita on average compared to East Africa. West Africa significantly improved its water sources and sanitation facilities by 90% and almost 80% respectively, even though there were cases whose improved sanitation facilities improved by only 10%. On the other hand, East Africa improved its water resources by 65% to 90% on average, whereas its sanitation facilities need to improve even further as their average rate varied from 30% to 70% and there were many cases where the improvement rates significantly increased up to the level of 90%. Finally, on average West Africa total natural resources rents contribute more to GDP (up to 15%) compared to East Africa.

South and South-East Asia

On average in south Asia total land use for agriculture purposes is significantly greater than south East Asia. There are cases where the use of land for agriculture reaches the level of 70% in south Asia, whereas in south East Asia the percentage is remarkably lower (up to 40%) and there are cases where the land is limited or not used at all. However, south Asia agriculture value added as percentage of GDP is lower than south East Asia. There are areas in West Africa where agriculture contributes to 35% of GDP. On average population density is lower (100 people/sq km) in south east region compared to south, varying from 50 to 250 people/sq km. In south Asia the population density varies from 50 to 400 people/sq km. On average 40% of the urban population in Asia lives in largest cities, having south East Asia's percentage increase up to 100%, whereas in south Asia there are cases where only 5% of the urban population live in the largest city. In Asia almost 10-15% of the urban population live in large cities whose population exceed 1 million, with south Asia having this percentage increase up to 25%. Also, road density is low in south east region compared to south, where its density varies from 30 to 120 km of road/sq of land. On average low percentage of land use area where elevation is below 5 meters is reported for both regions (almost 5%) even though in south East Asia up to 15% percentage of population lives in these areas. Moreover, with respect to the annual freshwater withdrawals, it is concluded that they are mainly used for agriculture purposes and less for domestic and industry purposes in both regions of Asia. The amount of fresher water withdrawals was on average the same in both regions of Asia, however, it reached the level of 180 and 120 billion cubic meters in some cases in south and south east Asia respectively. In south East Asia the average percentage of annual fresh water withdrawals as internal resources for any purpose varies from 5% to 40% reaching the level of 80%, which is not the case in south East Asia where its percentage is remarkably lower. Furthermore, renewable internal freshwater resources are significantly greater in south east Asia up to 1000 billion cubic meters or 30000 cubic meters per capita, whereas in south Asia the possibilities are extremely limited.. South Asia significantly improved its water sources and sanitation facilities by 90% and 80% respectively, even though there are cases whose improved sanitations facilities improved by only 10%. On the other hand, south East Asia improved its water resources by 50% to 90% on average, whereas its sanitation facilities need to improve even further as their average rate varied from 20% to 50% and there were many cases where the improvement rates

significantly increase up to the level of 100%. Finally, on average south East Asia total natural resources rents contribute more to GDP (up to 12%) compared to east Asia.

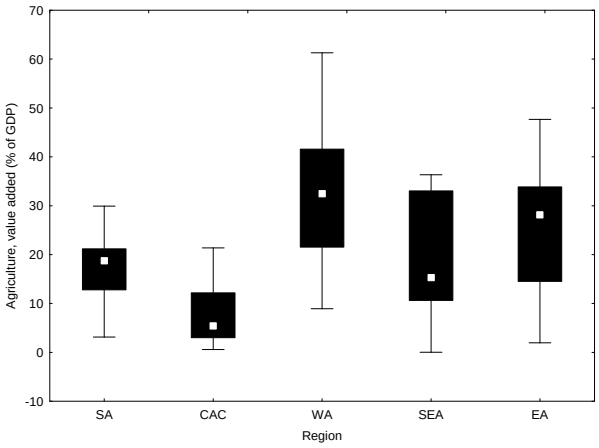
Central America and Caribbean countries (CAC)

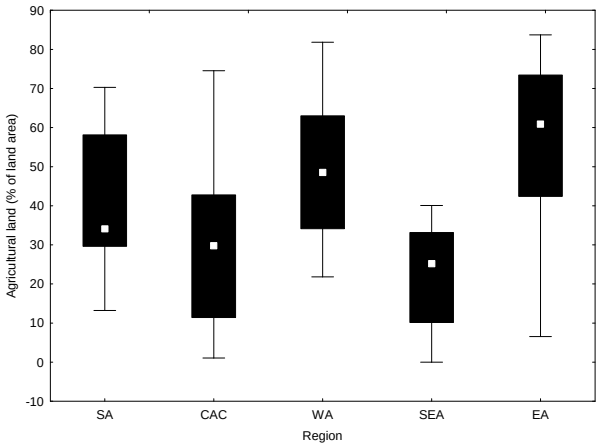
On average in Central America and Caribbean countries 10 to 40% of total land is used for agriculture purposes, and there are cases where 70% of the total land is used on agriculture. Therefore, its agriculture contributes up to 60% of GDP with average rates from 20% to 40%. The population density varies from 50 to 250 people/sq km on average and there are densely populated areas whose density can increase up to 600 people/sq km. Most of the urban population lives in the largest city, average rates from 30% to 60% reaching the level of 100% in some cases, and in cities whose population is more than 1 million, average rates from 20% to 35%. Also, road density is significantly high, with average rates varying from 30 to 200 km of road/sq of land and therefore, providing linkages and transportation in developed areas feasible. Furthermore, on average high percentage of land use area where elevation is below 5 meters is reported as a high percentage of population exists in these areas. Moreover, with regard to the annual freshwater withdrawals which account for 5% of the total natural resources, it is concluded that they are mainly consumed for agriculture and domestic purposes and then industry use. In CAC the amount of renewable internal freshwater resources is low (almost 100 billion cubic meters) even though there are cases where the renewable freshwater resources can reach the level of 25000 cubic meters per capita. In CAC on average the sanitation facilities improved from 30% to 80%, and the water resources were improved by 60% to 90% reaching the level of 100% in some cases, although there were many cases where the improvement rate was at the level of 30%.

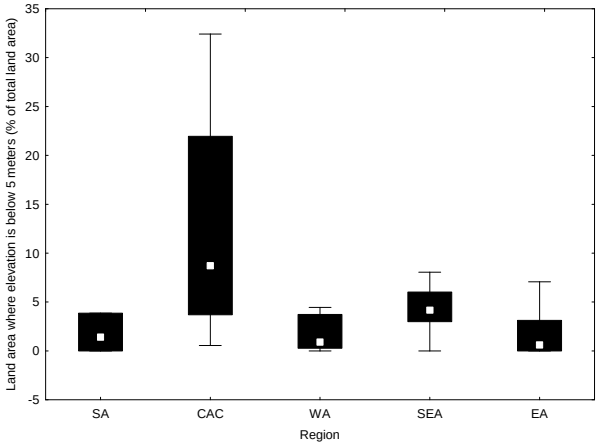
The following table represents the indicators chosen to conduct this preliminary analysis on the vulnerability patterns of CATALYST's sub-regions

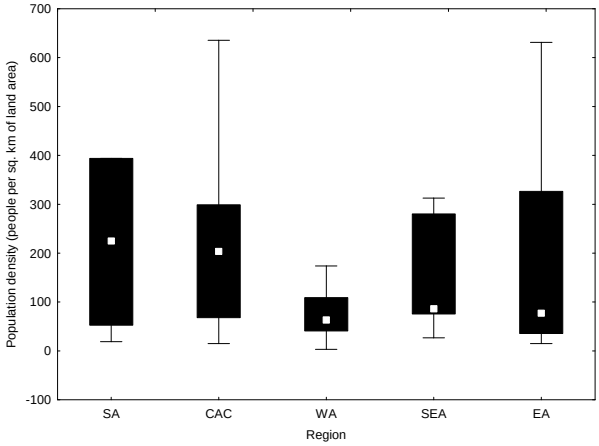
Table 5: Indicators of susceptibility to harm (different reference years based on the data availability) and their basic statistics: # number of valid observation, median, minimum and maximum value, lower and upper quartile (LQ, UQ) and standard deviation (STD). Data Source: UN Statistics Division and the World Bank, http://data.worldbank.org/

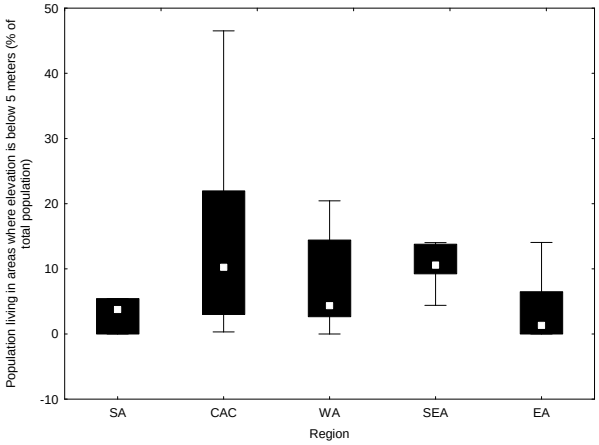
	#	Median	Min	Max	LQ	UQ	STD
Agriculture, value added (% of GDP)	74	17	0.0	65	6	32	16
Agricultural land (% of land area)	80	39	0.0	84	26	59	22
Land area where elevation is below 5 meters (% of total land area)	80	3	0.0	100	1	9	17
Population density (people per sq. km of land area)	80	106	3.4	7252	51	280	818
Population living in areas where elevation is below 5 meters (% of total population)	80	6	0.0	100	1	14	16
Population in the largest city (% of urban population)	76	40	6.3	126	26	54	24
Population in urban agglomerations of more than 1 million (% of total population)	43	14	3.5	95	10	23	17
Annual freshwater withdrawals, agriculture (% of total freshwater withdrawal)	68	77	0.0	99	46	90	28
Annual freshwater withdrawals, domestic (% of total freshwater withdrawal)	69	15	0.5	95	7	32	23
Annual freshwater withdrawals, industry (% of total freshwater withdrawal)	68	4	0.0	73	2	16	13
Annual freshwater withdrawals, total (billion cubic meters)	72	1	0.0	761	0	6	94
Annual freshwater withdrawals, total (% of internal resources)	67	5	0.1	80	1	14	16
Renewable internal freshwater resources, total (billion cubic meters)	70	34	0.0	2019	8	129	322
Renewable internal freshwater resources per capita (cubic meters)	70	2137	59.1	109295	983	7781	16891
Road density (km of road per 100 sq. km of land area)	70	22	1.0	475	12	53	90
Total natural resources rents (% of GDP)	77	2	0.0	65	0	6	10
Improved water source (% of population with access)	75	85	30.0	100	61	94	19
Improved sanitation facilities (% of population with access)	73	53	9.0	100	29	87	31

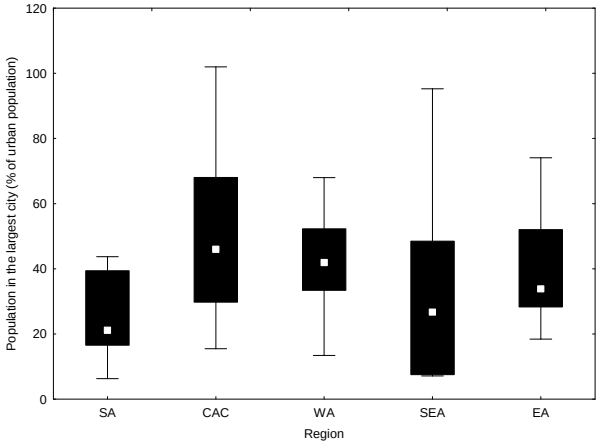

Agriculture, value added (% of GDP)
70
60
50
40
30
20
10
0
-10
SA
CAC
WA
SEA
EA
Region

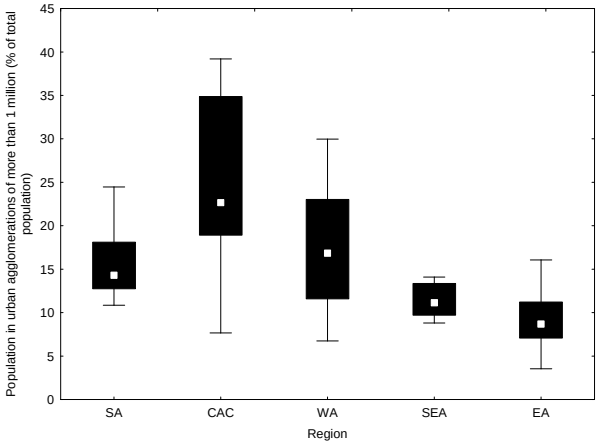

Agricultural land (% of land area)
90
80
70
60
50
40
30
20
10
0
-10
SA
CAC
WA
SEA
EA
Region

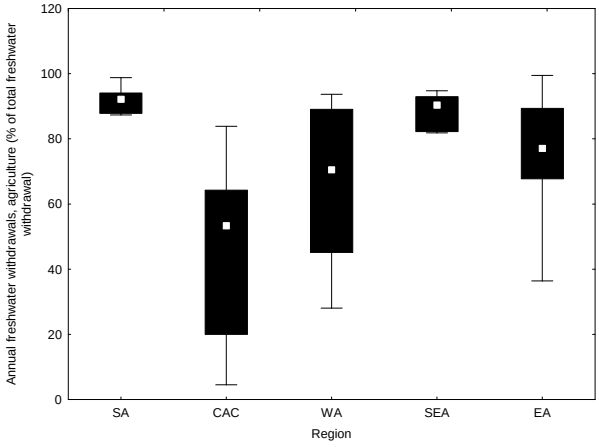

Land area where elevation is below 5 meters (% of total land area)
35
30
25
20
15
10
5
0
-5
SA
CAC
WA
SEA
EA
Region

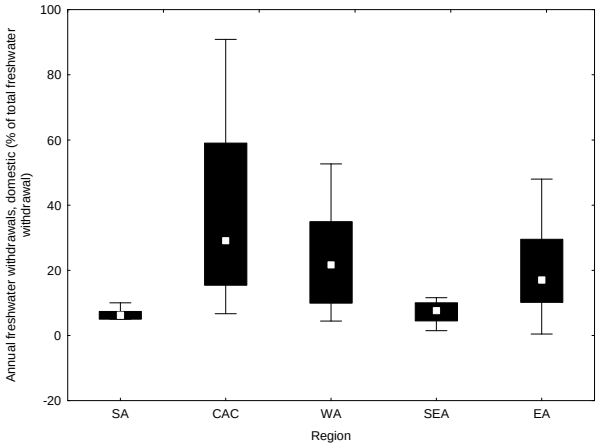

Population density (people per sq. km of land area)
700
600
500
400
300
200
100
0
-100
SA
CAC
WA
SEA
EA
Region

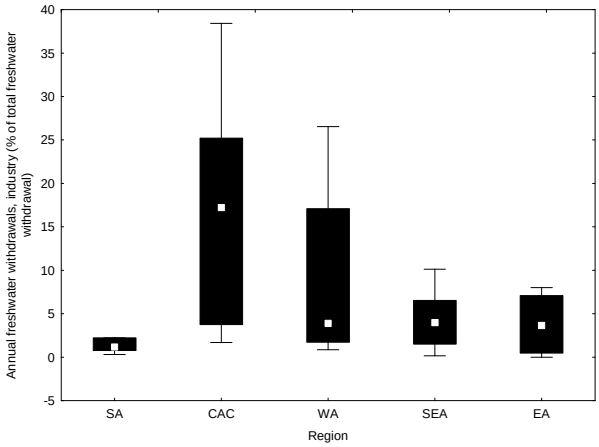

Population living in areas where elevation is below 5 meters (% of total population)
50
40
30
20
10
0
-10
SA
CAC
WA
SEA
EA
Region

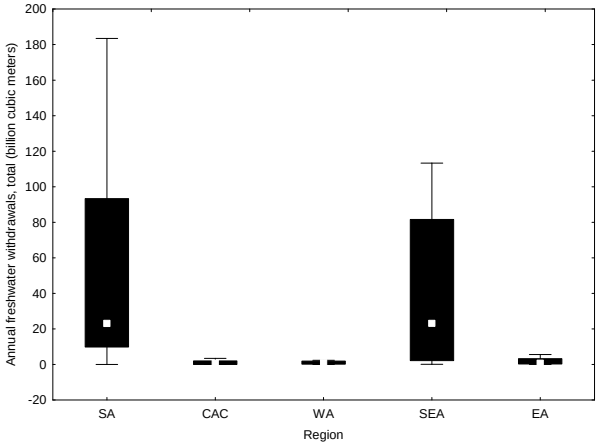

Population in the largest city (% of urban population)
120
100
80
60
40
20
0
SA
CAC
WA
SEA
EA
Region

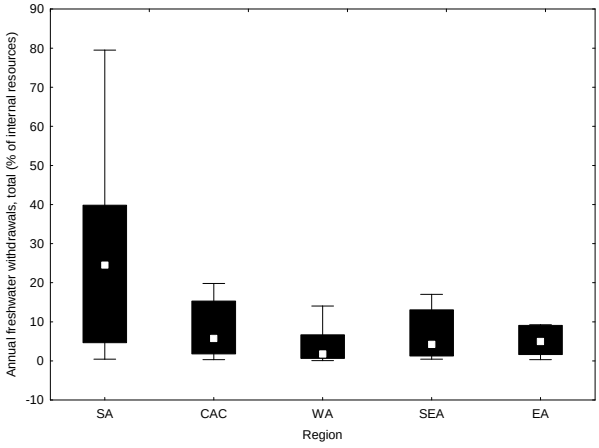

Population in urban agglomerations of more than 1 million (% of total population)
45
40
35
30
25
20
15
10
5
0
SA
CAC
WA
SEA
EA
Region

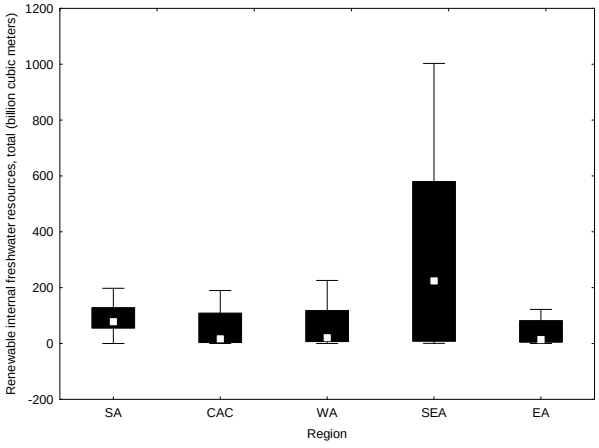

Annual freshwater withdrawals, agriculture (% of total freshwater withdrawal)
120
100
80
60
40
20
0
SA
CAC
WA
SEA
EA
Region

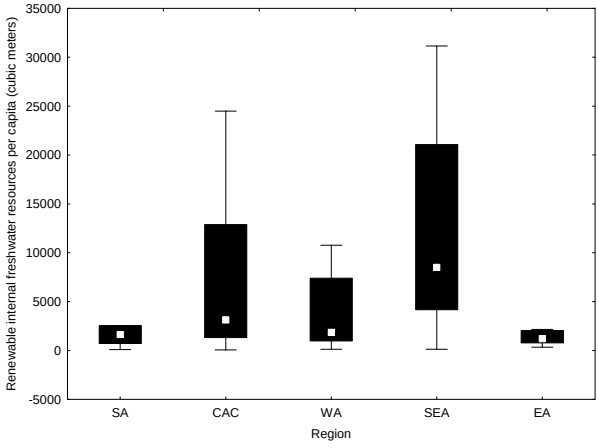

Annual freshwater withdrawals, domestic (% of total freshwater withdrawal)
100
80
60
40
20
0
-20
SA
CAC
WA
SEA
EA
Region

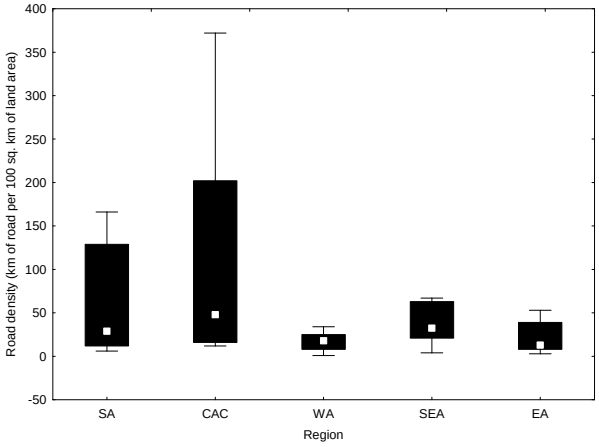

Annual freshwater withdrawals, industry (% of total freshwater withdrawal)
40
35
30
25
20
15
10
5
0
-5
SA
CAC
WA
SEA
EA
Region

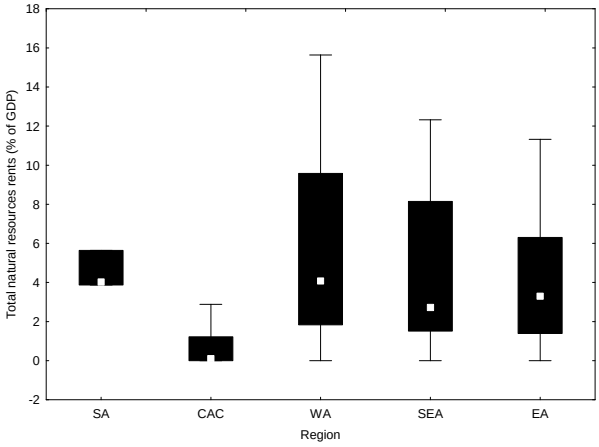

Annual freshwater withdrawals, total (billion cubic meters)
200
180
160
140
120
100
80
60
40
20
0
-20
SA
CAC
WA
SEA
EA
Region


Annual freshwater withdrawals, total (% of internal resources)
90
80
70
60
50
40
30
20
10
0
-10
SA
CAC
WA
SEA
EA
Region


Renewable internal freshwater resources, total (billion cubic meters)
1200
1000
800
600
400
200
0
-200
SA
CAC
WA
SEA
EA
Region


Renewable internal freshwater resources per capita (cubic meters)
35000
30000
25000
20000
15000
10000
5000
0
-5000
SA
CAC
WA
SEA
EA
Region


Road density (km of road per 100 sq. km of land area)
400
350
300
250
200
150
100
50
0
-50
SA
CAC
WA
SEA
EA
Region


Total natural resources rents (% of GDP)
18
16
14
12
10
8
6
4
2
0
-2
SA
CAC
WA
SEA
EA
Region

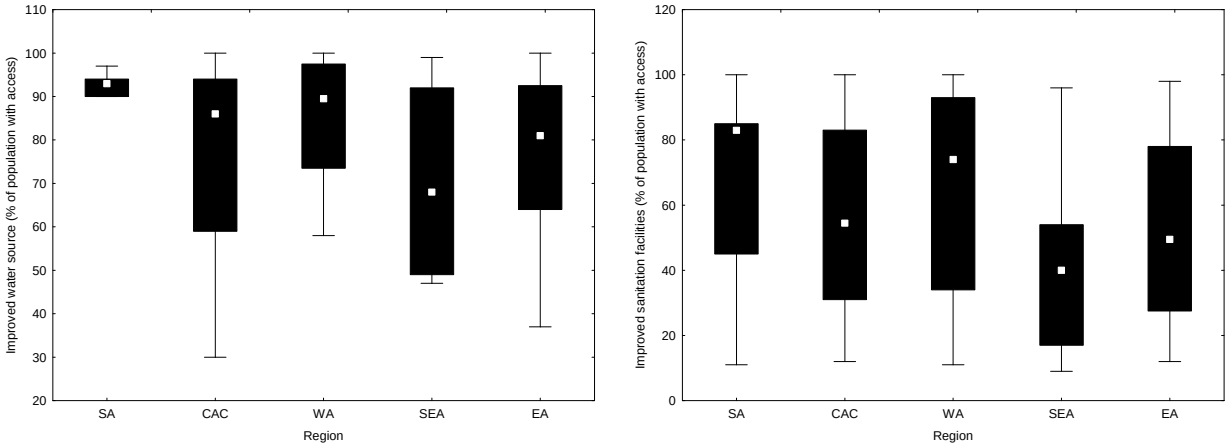


Figure 17: Box whiskers diagrams (showing median, lower and upper quartile, and outliers-free range) of the key indicators of susceptibility to harm from table 5 (own elaboration)

3.4 Coping capacity

Information regarding the quality of institutions for environmental sustainability, public administration, financial policy and management across regions was collected using qualitative criteria, value 1 if it was of low quality and value 6 if it was of high quality (**http://data.worldbank.org/**). This section also discusses results from other measures such as financial investments and grants, disaster risk reduction progress, education, internet use, health risk, human development index.

Table 6 provide a list of the chosen indicators for Coping capacity and their basic statistics at aggregated level, while Figure 18 shows the same indicators disaggregated for the different sub-regions.

West and East Africa

In West Africa institutions for environmental sustainability received an average quality rating of 3, varying from 2.5 to 3.5 while there were many cases where the institutions received an even lower rating, up to 2. In east Africa the average quality level of the institutions was good, and varied from 3 to 3.5, whereas there were many cases where the rating improved even further. Regarding the quality of public administration and the transparency of public sector, it is concluded that in West Africa their average ratings were at the level of 3, however, many places had a low or high average rating, 2 or 4.5, respectively. In east Africa the quality of public administration was at an average level of 3, while there were many places whose institutions received a very low rating, 1.5, while transparency and accountability of the public sector received average quality ratings which fluctuated from 2.5 to 3. It is worth mentioning that in both regions, almost 80% of the firms made informal payments to public officials. With respect to debt quality no significant differences between the two regions were found, their average ratings varied from 2.5 to 4, with east Africa having places with a very low quality, up to 1. Building human resources achieved higher quality average ratings in east Africa than west, having places with a quality of 4.5, whereas financial management received higher average rating in West Africa than east. In West Africa, financial sector received an average quality rating of 3 and many places received an even a higher quality value for fiscal policy. In east Africa, both financial sector and fiscal policy received an average quality rating of 3, with many places receiving an even lower quality value. Macroeconomic management received high quality rating in both regions, with east Africa having the highest percentage of quality rating between 3 to 4.5. In West Africa the average rating varied from 3.5 to 4, and finally, in east Africa there were cases where the quality of macroeconomic management was low. Higher average quality rating of equity of

public resource use was reported in east Africa than west, whereas social protection was reported only in West Africa with an average rating of 3. Looking now at other financial indicators, insurance and financial services as a percentage of service imports received slightly higher average rates in east Africa than west, whereas foreign direct investments did not have an important role in GDP in both regions. Net bilateral aid flows from DAC donors received significantly higher average rates in east Africa than west, reaching a level of $2 million, whereas there were not any differences regarding technical cooperation grants between the two regions. Both regions received the same average rating regarding disaster risk reduction progress, varying from 2.5 to 3.5, even though there were cases in West Africa where there were very low improvements. The percentage of land protected areas didn't increase significantly in both regions, on average 10%, with east Africa having the maximum level of protected areas (35%). With respect to the magnitude of inequality in income and wealth, east Africa showed higher inequality levels compared to west, reporting the highest level of inequality at 65%. Turning our discussion now to other social indicators, it is concluded that the education level, internet users and telephone lines are poor in both regions of Africa, with West Africa having a slightly higher average rate of cellular subscribers than east. The results from health indicators suggest that in east Africa the official aid received was significantly greater than west and thus, the rates of prevalence of HIV and hospital beds were higher as well, but still remained in low levels. However, the human development index which consists of three indices, life expectancy, education and income, was slightly higher in East Africa, reaching its highest level at 0.30, whereas West Africa's highest level was at 0.40. In both regions however it still remains low, 0.25.

South and South-East Asia

In southeast Asia institutions for environmental sustainability received an average quality rating of 3, varying from 3 to 3.5, while there were many cases where the institutions received an even lower rating up to 2.5 or a higher quality rating up to 4. In south Asia the average quality level of the institutions was good, and varied from 3 to 3.7, whereas there were many cases where the quality rating improved even further. As far as the quality of public administration and the transparency of the public sector are concerned, it is concluded that in south Asia their average ratings were at the level of 3. The maximum level of quality for the public administration was even higher, while the transparency of the public sector received even lower values. In Southeast Asia the quality of public administration was at an average rating of 3, varying from 2.5 to 3.4, while the average quality level for public sector regarding transparency and accountability received lower values, fluctuated from 2 to 3. It is worth mentioning that in south Asia, almost 80% of the firms made informal payments to public officials, whereas in Southeast Asia it reached the level of 60%. With respect to debt policy no significant differences between the two regions were found, their average quality ratings were good and varied from 3.5 to 4. Building human resources achieved higher average rates in south Asia than south east, having places with a maximum quality rating of 4.5, whereas financial management received high average ratings in south Asia. Also, in south Asia, financial sector received an average quality level of 3, whereas fiscal policy's average quality rating varied from 3 to 3.7 receiving in some cases the minimum quality value of 2. In south East Asia, on the other hand, the financial sector varied from 2.5 to 3 on average, but its fiscal policy received greater quality rating. Macroeconomic management received high quality rating in both regions, with south East Asia having the highest percentage of quality rating between 4 to 4.5. In south Asia the average quality rating varied from 3 to 4.2, and finally, in south Asia there were places where the quality of macroeconomic management was low. High average quality rating of equity of public resource use was reported in both regions, with south Asia receiving a maximum quality value of 4.5, whereas social protection varied significantly in Southeast Asia, from 2.5 to 3.5, having received even the lowest quality value of 1. Looking now at other financial indicators, insurance and financial services as a percentage of service imports received higher average rates in south Asia than south east, whereas foreign direct investments have an important role in GDP only in Southeast Asia. Net bilateral aid flows from DAC donors received

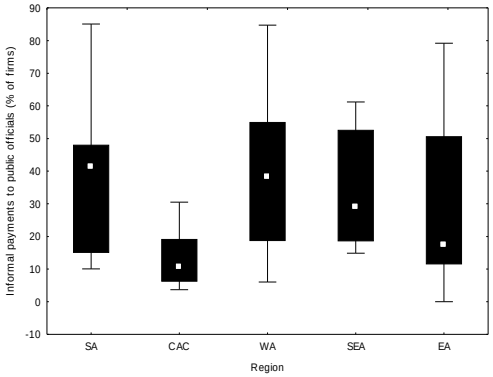
significantly higher average rates in south Asia than south east, reaching a level of $1.7 million, whereas there were significant differences regarding technical cooperation grants between the two regions, with Southeast Asia receiving its maximum level at $5 million. Both regions received the same average rating regarding disaster risk reduction progress, varying from 2.5 to 3.5, even though there were cases in Southeast Asia where there were low improvements. The percentage of land protected areas did not increase significantly in both regions, on average 10%, with south Asia having the maximum level of terrestrial protected areas (27%). With respect to the magnitude of inequality in income and wealth, south Asia showed slightly higher inequality levels compared to south east, however, in both regions the inequality levels remained low. Turning our discussion now to other social indicators, it is concluded that the education level and telephone lines are poor in both regions of Asia, with Southeast Asia having a significant higher average rate of cellular subscribers and internet users per 100 persons than South Asia. The results from health indicators suggest that in south Asia the official aid received was significantly greater than south, however, the rates of prevalence of HIV and hospital beds were higher in Southeast Asia. Both indicators still remained in low levels. With respect to the human development index, it was significantly higher in Southeast Asia, reaching its highest level at 0.60, whereas south Asia's highest level was at 0.50. In both regions however this index still needs to improve, at it remains in low levels, 0.40.

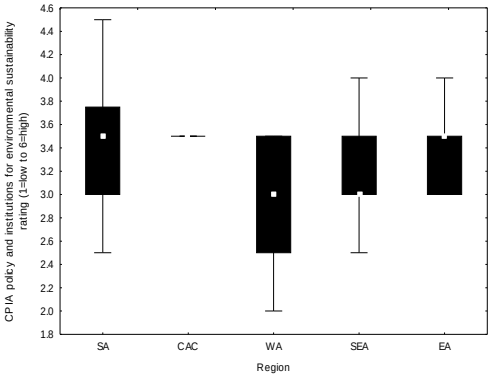
Central America and Caribbean countries (CAC)

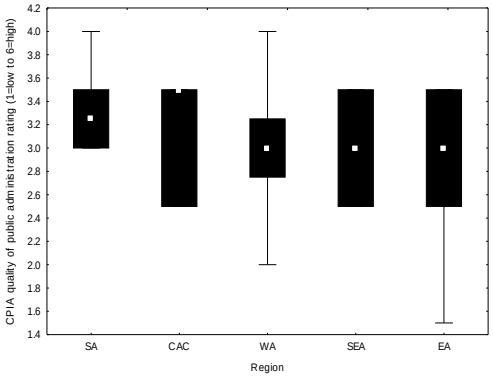
In CAC the quality of public administration was good with an average rating of 3.5, varying from 2.5 to 3.5,. Also, the average quality level for public sector transparency received high values, fluctuating from 3 to 4, reaching its maximum level at 4.5. It is worth mentioning that in CAC, only 10% of the firms made informal payments to public officials. With respect to debt policy, its average rating was very satisfactory and varied from 3 to 4 whereas there were many cases where the quality rating improved even further. Both building human resources and financial management received good average quality values, varying from 3 to 4. The same evidence is apparent regarding fiscal sector and fiscal policy. The former received an average quality indicator of 3.5, achieving its highest value at 4, and the latter achieved its maximum value at 4.5. Macroeconomic management received high quality rating as well, with the average value varying from 3.5 to 4, whereas its minimum value never fell below 3. Looking now at other financial indicators, insurance and financial services as a percentage of service imports received high average rates, up to 22% whereas foreign direct investments did not have an important role in GDP. Net bilateral aid flows from DAC donors were minimal, whereas there were not any significant technical cooperation grants. Their maximum level was of $1 million. Moreover, the average rating regarding disaster risk reduction progress was high, varying from 3 to 3.7, and there were places where even more improvements occurred. The percentage of land protected areas was amount from 5% to 20% on average, reaching its maximum level at 42%. With respect to the magnitude of inequality in income and wealth, CAC showed high inequality levels compared to the regions, on average 50%, reporting a highest level of inequality at 60%. Turning our discussion now to other social indicators, it is concluded that the education level, internet and telephone users are in a better situation in CAC compared to the other countries. The education index was on average 0.5 reaching its maximum level at 0.6, whereas significant high average rates were reported with respect to telephone lines, internet users and cellular subscribers per 100 persons. 0n average 30 internet users per 100 were reported, with a maximum value of 70 users in some places. The results from health indicators suggest that CAC received low levels of official aid and therefore the rates of prevalence of HIV and hospital beds did not improve significantly. However, the human development index as measured by life expectancy, education and income, on average was significantly higher in CAC than Asia and Africa, 0.50.

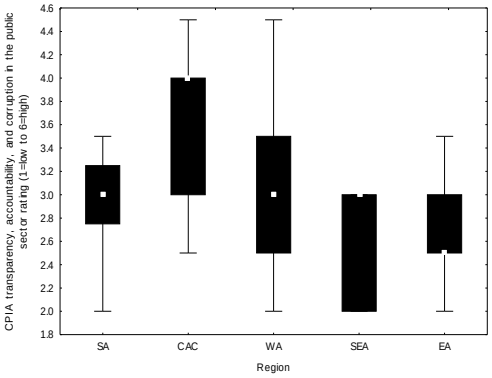
Table 6: Indicators of coping/adaptive capacity (different reference years based on the data availability) and their basic statistics: # number of valid observation, median, minimum and maximum value, lower and upper quartile (LQ, UQ) and standard deviation (STD). Data Source: UN Statistics Division and World Bank.

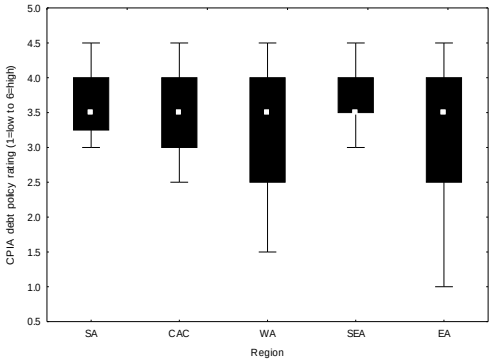
	#	Median	Min	Max	LQ	UQ	STD
Informal payments to public officials (% of firms)	52	20	0,0	85,1	12	49	23,3
CPIA policy and institutions for environmental sustainability rating (1=low to 6=high)	50	4	2,0	4,5	3	4	0,6
CPIA quality of public administration rating (1=low to 6=high)	50	3	1,5	4,0	3	4	0,5
CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high)	50	3	1,5	4,5	3	3	0,7
CPIA debt policy rating (1=low to 6=high)	50	4	1,0	4,5	3	4	0,9
CPIA building human resources rating (1=low to 6=high)	50	4	1,0	4,5	3	4	0,7
CPIA quality of budgetary and financial management rating (1=low to 6=high)	50	4	2,0	4,5	3	4	0,6
CPIA financial sector rating (1=low to 6=high)	50	3	1,0	4,0	3	4	0,6
CPIA fiscal policy rating (1=low to 6=high)	50	4	2,0	4,5	3	4	0,7
CPIA gender equality rating (1=low to 6=high)	50	4	2,0	4,5	3	4	0,6
CPIA macroeconomic management rating (1=low to 6=high)	50	4	2,0	4,5	4	4	0,7
CPIA equity of public resource use rating (1=low to 6=high)	50	4	1,5	4,5	3	4	0,6
CPIA social protection rating (1=low to 6=high)	49	4	1,0	4,5	3	4	0,5
Insurance and financial services (% of service imports, BoP)	71	6	0,0	22,2	3	10	4,7
Foreign direct investment, net outflows (% of GDP)	49	0	-0,6	9,5	0	1	2,0
Technical cooperation grants (mil current US$)	66	69,5	0,0	958,2	11,2	121	138,3
Net bilateral aid flows from DAC donors, Total (mil current US$)	78	290	-71	5484	43	618	766
Disaster risk reduction progress score (1-5 scale; 5=best)	43	3	1,0	4,5	3	4	0,7
Terrestrial protected areas (% of total land area)	79	11	0,0	42,9	5	20	11,0
GINI index	61	43	29,4	65,8	38	48	8,0
Physicians (per 1,000 people)	78	0	0,0	6,4	0	1	0,9
Education index	73	0	0,1	0,6	0	0	0,1
Telephone lines per 100 population	83	4	0,2	86,5	1	20	17,8
Cellular subscribers per 100 population	83	67	0,0	184,7	39	113	47,3
Internet users per 100 population	83	9	0,0	74,2	2	28	18,4
Net official development assistance and official aid received (mil current US$)	78	333	-76,6	6235	65,5	934,4	1065
Prevalence of HIV, total (% of population ages 15-49)	61	1	0,1	14,3	0	2	3,2
Hospital beds (per 1,000 people)	76	1	0,1	18,7	1	2	2,4
Human Development Index (HDI) value	73	0	0,2	0,6	0	0	0,1
Life expectancy at birth (years)	26	68	48,1	79,0	58	76	9,7
Population, urban (%) (% of population)	26	48	11,0	84,0	28	64	21,5

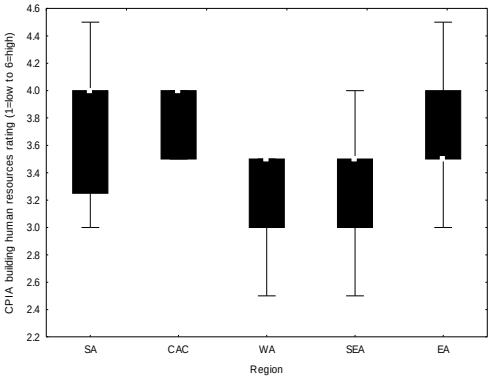

Informal payments to public officials (% of firms)
90
80
70
60
50
40
30
20
10
0
-10
SA
CAC
WA
SEA
EA
Region

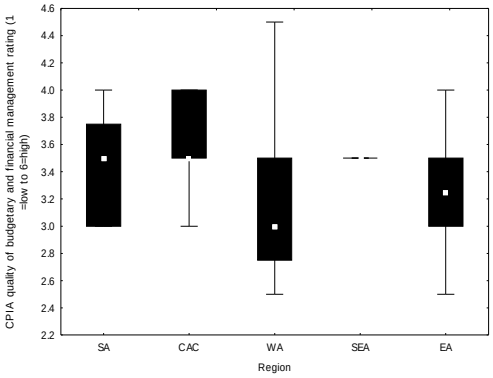

CPIA policy and institutions for environmental sustainability rating (1=low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
SA
CAC
WA
SEA
EA
Region

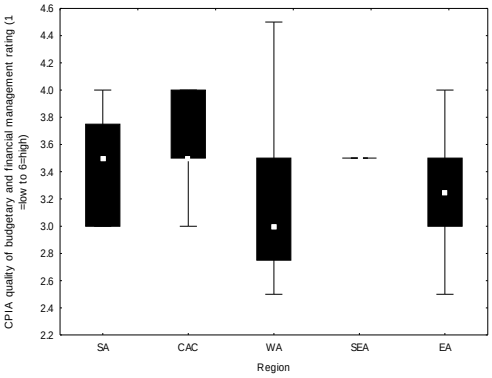

CPIA quality of public administration rating (1=low to 6=high)
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
SA
CAC
WA
SEA
EA
Region

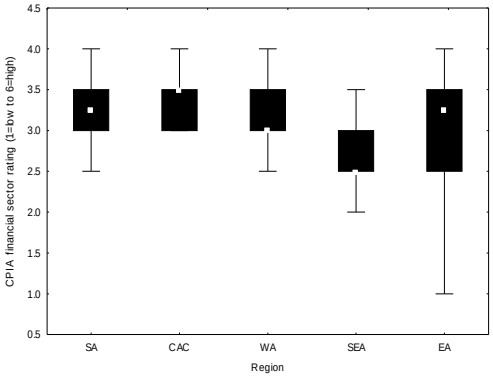

CPIA transparency, accountability, and corruption in the public sector rating (1=low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
SA
CAC
WA
SEA
EA
Region

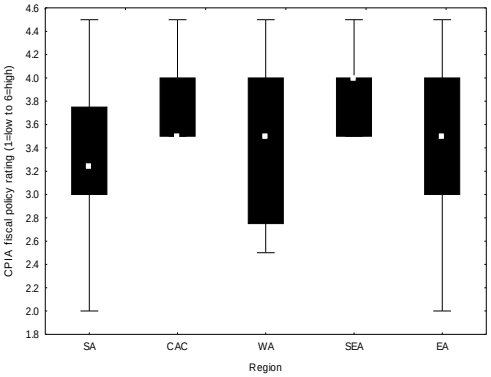

CPIA debt policy rating (1=low to 6=high)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
SA
CAC
WA
SEA
EA
Region

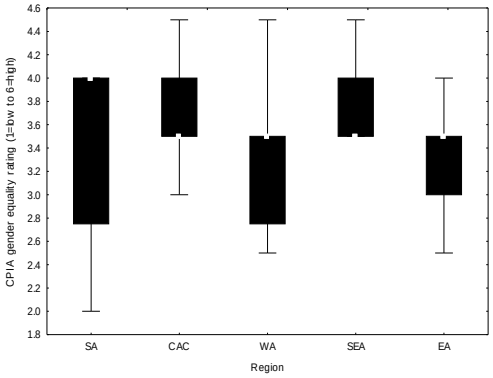

CPIA building human resources rating (1=low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
SA
CAC
WA
SEA
EA
Region

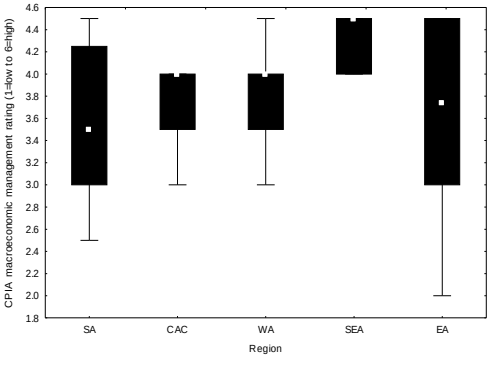

CPIA quality of budgetary and financial management rating (1 =low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
SA
CAC
WA
SEA
EA
Region


CPIA quality of budgetary and financial management rating (1 =low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
SA
CAC
WA
SEA
EA
Region


CPIA financial sector rating (1=low to 6=high)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
SA
CAC
WA
SEA
EA
Region


CPIA fiscal policy rating (1=low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
SA
CAC
WA
SEA
EA
Region


CPIA gender equality rating (1=low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
SA
CAC
WA
SEA
EA
Region


CPIA macroeconomic management rating (1=low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
SA
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WA
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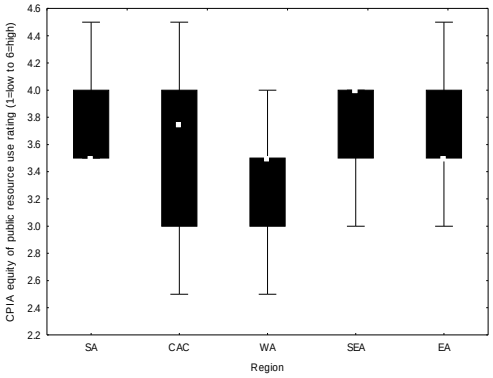
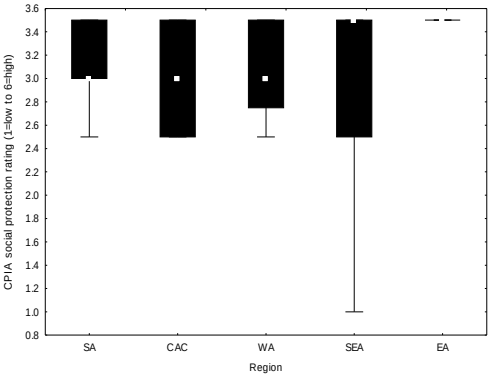
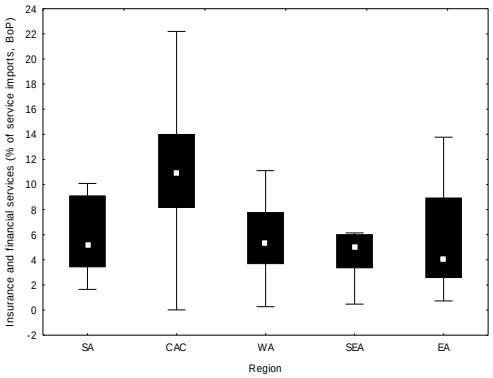
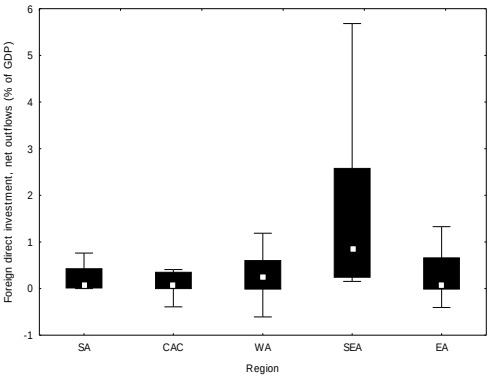
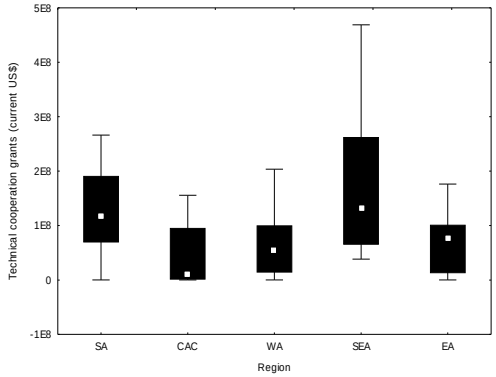
Region

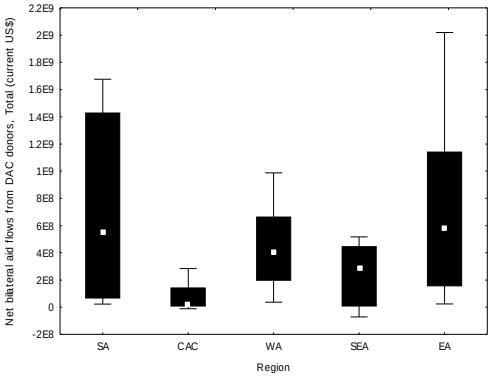

CPIA equity of public resource use rating (1=low to 6=high)
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
SA
CAC
WA
SEA
EA
Region

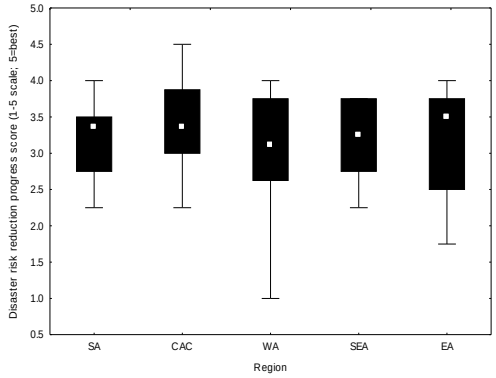

CPIA social protection rating (1=low to 6=high)
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
SA
CAC
WA
SEA
EA
Region

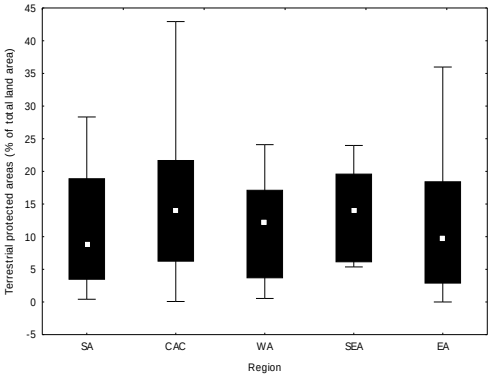

Insurance and financial services (% of service imports, BoP)
24
22
20
18
16
14
12
10
8
6
4
2
0
-2
SA
CAC
WA
SEA
EA
Region

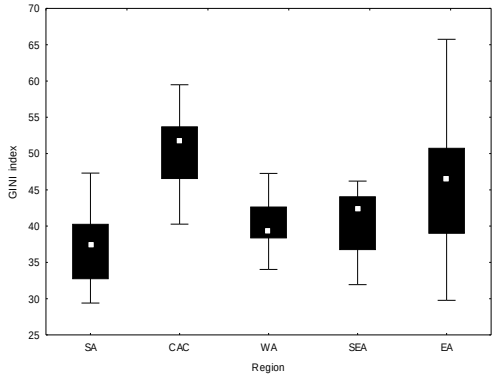

Foreign direct investment, net outflows (% of GDP)
6
5
4
3
2
1
0
-1
SA
CAC
WA
SEA
EA
Region

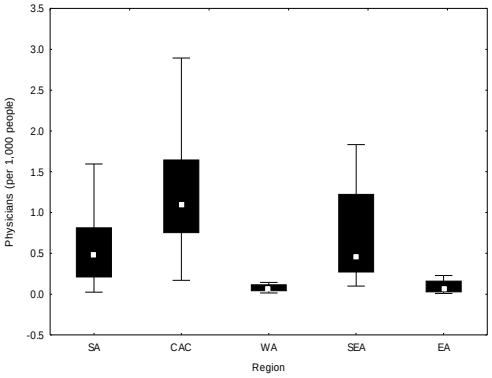

Technical cooperation grants (current US$)
5E8
4E8
3E8
2E8
1E8
0
-1E8
SA
CAC
WA
SEA
EA
Region

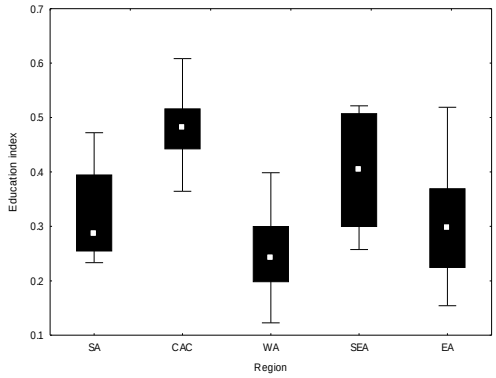

Net bilateral aid flows from DAC donors, Total (current US$)
2.2E9
2E9
1.8E9
1.6E9
1.4E9
1.2E9
1E9
8E8
6E8
4E8
2E8
0
-2E8
SA
CAC
WA
SEA
EA
Region

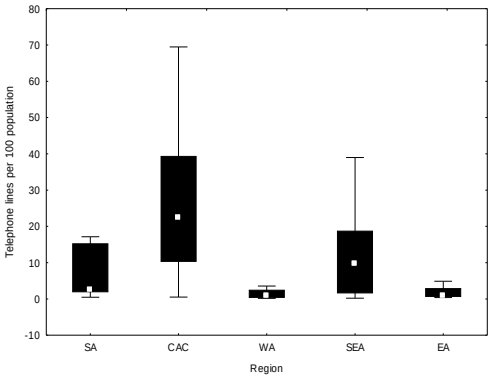

Disaster risk reduction progress score (1-5 scale; 5-best)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
SA
CAC
WA
SEA
EA
Region


Terrestrial protected areas (% of total land area)
45
40
35
30
25
20
15
10
5
0
-5
SA
CAC
WA
SEA
EA
Region


GINI index
70
65
60
55
50
45
40
35
30
25
SA
CAC
WA
SEA
EA
Region


Physicians (per 1,000 people)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
SA
CAC
WA
SEA
EA
Region


Education index
0.7
0.6
0.5
0.4
0.3
0.2
0.1
SA
CAC
WA
SEA
EA
Region


Telephone lines per 100 population
80
70
60
50
40
30
20
10
0
-10
SA
CAC
WA
SEA
EA
Region

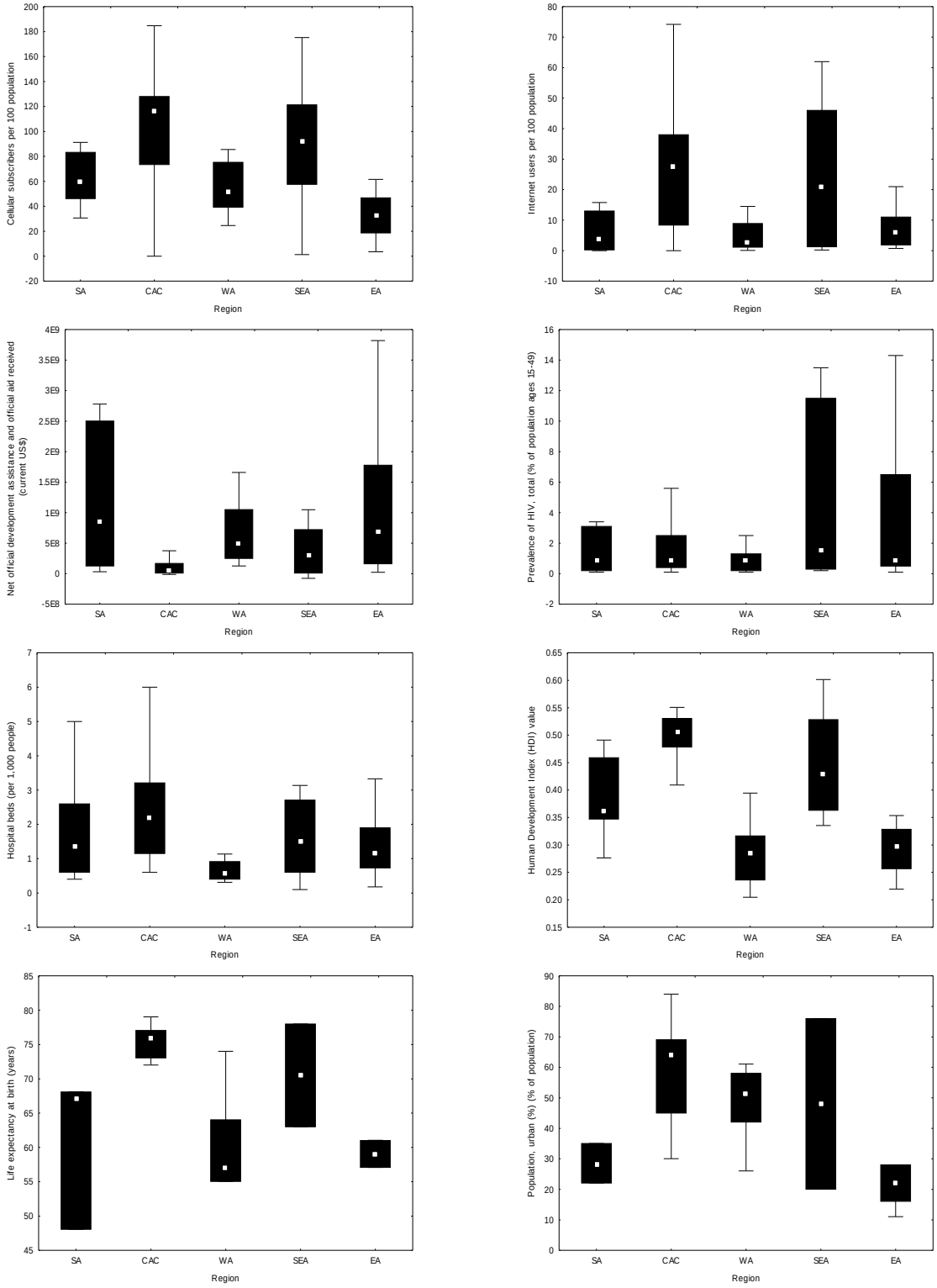


Figure 18: Box whiskers diagrams (showing median, lower and upper quartile, and outliers-free range) of the key indicators of the coping and adaptive capacity (own elaboration)

Table 7: National Platforms for Disaster Risk Reduction in the Catalyst's sub-regions. *Source*: http://www.unisdr.org

National Platforms for Disaster Risk Reduction			
West Africa	**East Africa**	**Central America and Caribbean**	**South and South-East Asia**
Benin	Burundi	Dominican Republic	Afghanistan
Burkina Faso	Comoros	Jamaica	Iran (Islamic Republic of)
Cape Verde	Djibouti	Costa Rica	Sri Lanka
Cote d'Ivoire	Kenya	El Salvador	Indonesia
Gambia	Madagascar	Guatemala	Philippines
Ghana	Seychelles	Mexico	
Guinea	Uganda	Nicaragua	
Guinea-Bissau	United Republic of Tanzania	Panama	
Mali	Zambia		
Mauritania			
Niger			
Nigeria			
Senegal			
Sierra Leone			
Togo			

4 WEST AND EAST AFRICA

4.1 Key vulnerabilities of the region

The region of East Africa has one of the largest concentrations of poverty in the world and is characterised by widespread food insecurity and deprivation. Even though the rates of economic growth vary considerably among the countries of the area, the majority of them are slipping backward in terms of MDGs such as reducing infant mortality rates and food security. East Africa remains the epicentre of the HIV epidemic, whose impacts cause widespread human and economic devastation and undermine the possibilities of a rapid and significant reduction in poverty. The proportion of people living with less than 1 US$ a day is slightly declining, but the absolute number continues to increase. The problematic socio – economic situation of the region is exacerbated by its high vulnerability to natural hazards. Drought remains the most common and destructive hazard, leading to famine across the region. The most affected area is the Horn of Africa, even though Mozambique and Zambia also suffer recurring food insecurity. Flooding is another common hazard in the region, while wind storms are a considerable problem in the coastal areas of Mozambique. Climate change is a new and alarming challenge, which is likely to have heavy negative impacts on the predominant rural population of the region. Extreme meteorological and climatologic events are becoming more frequent and result detrimental to farmer, their crops and poor rural people in general, this last affected by disproportionately rising food prices.

Urbanisation is one of the major challenges of African cities. Particularly in Western Africa urban population is expanding rapidly. While in 1950, a mere 6.6 million people lived in Western African cities, in 2010 the urban population already featured 137.2 million (regional urbanisation average of almost 45 per cent). Solely between 2000 and 2010 the urban population rose from 92.1 million 137.2 million (a near 50 per cent increase). Western Africa will become predominantly urban around 2020 with an estimated 195.3 million city dwellers. By 2050, that number will reach 427.7 million, or 68.36 per cent of the total population. Cities such as Porto Novo, Benin, Ouagadougou, Burkina Faso, Accra, Ghana, Niamey, Niger, Lagos, Nigeria and Lomé in Togo, are all confronted with ‘over-urbanisation’, which means that he populations are growing much faster than local economies, leading to major social and economic challenges like high unemployment rates, slum proliferation, social polarization and crime. At the same time, does the capacity of most West African nations to manage the consequences of undesirable urban trends decreasing, due to inadequate spending on human and institutional capacities, services delivery, adequate and affordable housing and job opportunities.

With only an estimated 23.5 per cent of the population living in urban areas, East Africa remains the least urbanised sub-region on the continent. Thereby this region lies clearly below the all-African average of approximately 40%. Nevertheless, it is rapidly catching up. Between the year 2000 and 2005, the populations of Nairobi and Dar-es Salaam experienced annual average growth rates of four per cent, compared to the all-African annual average growth rate of 3,4%. East Africa’s future is unquestionably urban, although it is to take another 40 years before a majority of the population lives in towns and cities. During the incipient decade, East Africa’s urban population is projected to increase by another 38.9 million to 116.1 million in 2020, a 50.4 per cent growth rate. Similar as in West African cities urban areas in East Africa are plagued by high urban unemployment, overstretched and deteriorated infrastructure and delivery systems, environmental degradation and acute shortages of affordable housing and residential land. These factors result in a rapid proliferation of slums, informal settlements and overcrowding.

But not only a rapidly growing population is challenging the cities. They are also confronted with increasing weather related hazards. The climate of East and Western Africa is forecasted to have an increase in precipitation variability and temperature as well as in sea level rise and tropical cyclone activity. The particular combination of impacts will vary with latitude, region and among coastal and inland areas. Coastal areas are likely to experience

storm surges, sea-level rises, increased flooding and (semi-) permanent inundation of low-lying areas. In many coastal cities, assets of strategic national economic value, such as ports, arterial railway/ road infrastructure, industrial zones, leisure/recreation zones or residential areas, are under threat from climate change. For inland cities, the main challenges are likely to include higher ambient temperatures and more frequent heat waves, leading to stronger heat island effects (with potential damage to infrastructure) and desiccating vegetation, shrinking water tables and associated urban water shortages, unless compensating supplies can be secured via engineered infrastructures. The more vulnerable cities will be those already experiencing heat stress and related problems during the summer season, as well as those in the Sahel on or close to the boundary between the desert and the bush, such as Ouagadougou for instance. Moreover, on-going urbanisation has densified coastal cities and, consequently, many more urban dwellers are now threatened by changing sea levels and more frequent extreme weather events. Droughts in the hinterlands stimulate eco-migration and further swell urban populations.

4.2 Core Think Tank Members of the West and East Africa region

Generally, the African stakeholders are working on many levels. On the one hand, large global/continental organisations (UN, NGOs, etc.) address other intergovernmental organisations, NGOs, etc. but often have national contact points through which they also work in regions and communities. On the other hand those stakeholders coming from research, governments, administration and municipalities work more on national to local levels when it comes to capacity building, with a focus on specific (urban) areas. These latter belong to those think tank members who are also involved in another FP7 funded EU Project (CLUVA, www.cluva.eu) that Catalysts collaborates with.

Table 8: Think Tank Members of the West and East Africa region. * MoU not yet received but very interested, ** Contacted but no response so far

	Acronym	Full name	Country	Networks	Contact person	Type
AFR	UNEP ROA	UN Environment Programme Regional Office for Africa, Nairobi	KE	GEF, many more	Emily Massawa	IO
AFR	UN-HABITAT ROAAS	UN-HABITAT Regional Office for Africa and the Arab States, Nairobi	KE	multiple	Dan Lewis Ansa Masaud	IO
AFR	UN WFP	UN World Food Programme	IT	multiple	Niels Balzer	IO
AFR	DRMFSS / WFP	DRMFSS, Ministry of Agriculture, Government of Ethiopia & United Nations World Food Programme, Ethiopia Country Office, Addis Ababa	ET	multiple, national, GEF	Animesh Kumar	IO
AFR	IFRC Africa	International Federation of Red Cross and Red Crescent Societies / IFRC Geneva - Nairobi	KE	GFDRR	Alexander Matheou	NGO
AFR	ICLEI Africa	Local Governments for Sustainability Africa, Cape Town	ZA	PURR	Lucinda Fairhurst Priscilla Roswell	NGO
AFR	Periperi U	Partners Enhancing Resilience to People Exposed to Risks University Platform	DZ	Periperi U, US AID	Djillali Benouar	A
AFR	EiABC, U Addis Ababa	Ethiopian Institute of Architecture Building Construction and City Development, Addis Ababa University, Addis Ababa	ET	research	Liku Workalemahu Dr Karola Hahn	A
AFR	IHSS, U Ardhi	Institute of Human Settlement Studies, Ardhi University, Dar es Salaam	TZ	research	Wilbard J. Kombe	A
AFR	U Saint Louis	Université Gaston Berger de Saint Louis, Saint Louis	SN	research	Adrien Coly	A
AFR	ENSP, U de Yaoundé I	Ecole Nationale Supérieure Polytechnique, Université de Yaoundé I, Yaoundé	CM	research	Emmanuel Tonyé	A
AFR	UNDP AAP*	UNDP African Adaptation Programme, Dakar	SN	ClimDev-Africa, GEF, CADRI, etc.	Ian Rector Jose Levy Joseph Intsiful	IO
AFR	Plan International / CORDAID	Plan International Inc., Region of Eastern & Southern Africa (RESA) & CORDAID, Nairobi	KE	multiple	Marko Lesukat	NGO
AFR	ENDA-TM*	Environment and Development Action in the Third World (ENDA Tier Monde), Dakar	SN	AfricaAdapt	Moussa Na Abou Mamouda Oumou Koulibaly	NGO
AFR	GCAP*	Global Climate Adaptation Partnership, Nairobi	KE	multiple	Prof Mohamed Hamza	SME
AFR	IIED	International Institute for Environment and Development	Various / UK	OECD-ENVIRONET, IUCN, SDI, etc.	David Dodman	A / NGO
AFR	ACDS, U North-West	African Centre for Disaster Studies, North-West University, Potchefstroom Campus	ZA	Periperi U, DiMP	Dewald van Niekerk	A
AFR	U Ouagadougou*	University of Ouagadougou, Ouagadougou	BF	research	Hamidou Touré Jean-Baptiste	A
AFR	ACTS*	African Centre for Technology Studies, Nairobi	KE	DiMP	Judi W. Wakhungu	A
AFR	World Bank**	World Bank, Sustainable Development Sector Department, Environment and Natural Resources (AFTEN) Africa Region	KE/US	multiple, GEF, GFDRR	Milen F. Dyoulgerov Raffaello Cervigni Johannes Woelcke	IO
AFR	IDRC**	International Development Research Centre, Regional Office for Eastern and Southern Africa	KE/CA	multiple	n.n.	NGO
AFR	DMTC, U Ardhi**	Disaster Management Training Centre, Ardhi University, Dar es Salaam	TZ	Periperi U, DiMP	Gabriel Kassenga	A
AFR	IISD**	International Institute for Sustainable Development	Various / CA	multiple	Livia Bizikova Jo-Ellen Parry	A

Intergovernmental organisations involved in NH/DRR/CCA (other than the UN agencies) in sub-Saharan Africa include the African Union (AU) with various councils and commissions, the Economic Community of West African States (ECOWAS) and the East African Community (EAC), the Intergovernmental Authority on Development (IGAD) and the African Development Bank Group (ADBG). So far, they are not represented in the CATALYST Think

Tank.

UN organisations particularly active in Africa are UNDP with its Africa Office and the African Adaptation Programme (AAP) and the Drylands Development Centre (DDC), UNEP with its Regional Office Africa (ROA), UN-HABITAT with its Regional Office for Africa and the Arab States (ROAAS), the UN International Strategy for Disaster Reduction (UN ISDR) with its Africa Office, the UN Office for the Coordination of Humanitarian Affairs (OCHA) with its Regional Office for West & Central Africa (ROWCA), the UN World Food Programme (WFP, mainly the Disaster Risk Management & Food Security Sector and its national contact points), the UN Framework Convention on Climate Change (UNFCCC) and the UN Economic Commission for Africa (ECA) with its African Climate Policy Centre (ACPC), amongst many others. All of these UN bodies were contacted, but those that agreed to participate in the Think Tank are:

The **UN Environment Programme's (UNEP)** activities in Africa aims at assisting African governments and major stakeholders in addressing the challenges in addressing issues of climate change, the energy crisis, the persistent extreme poverty, food insecurity, inadequate health services, political and social crisis, as part of its mandate. The programme ensures that there is better coherence and coordination in the effective delivery of environmental capacity-building and technical support at all levels in response to country needs and priorities. The Strategic Framework for Africa (RSFA) provides strategic direction and defines modalities for the analysis of environment and development challenges, opportunities as well as the providing a delivery mechanism for the region that will ensure effective implementation of UNEP's work in Africa. The Regional Office for Africa (ROA) is headed by the Regional Director who has a Deputy Director, Programme and Policy Coordinator, Sub Programme Team Leaders (Technical Experts), each heading a Sub Programme and/or technical units. In addition there are five sub-regional Coordinators for each of the sub-regional blocks (Central Africa, East Africa, West Africa, North Africa and Southern Africa. In addition there are the Delivering as One, Kenya Country Programme and Poverty and Environment Initiative Coordinators, the Head of Communication and Outreach, the Coordinators for the two Conventions (Nairobi and Abidjan) and the MEA Focal Points and various divisions. ROA has played a central role in coordinating UNEP's Programme of Work in the region with the view to ensuring the effective and efficient delivery of interventions, in response to regional, sub-regional and national needs. The delivery of this programme in Africa is a collective effort by UNEP and various partners, Governments institutions and Ministerial fora, non-governmental agencies, regional economic communities, other sister agencies, Major groups and stakeholders including Civil Society organizations, the private Sector, local Authorities and others, as well as regional Centres of Excellence. UNEP is focusing on both mitigation and adaptation and the objective is to strengthen the ability of countries in integrating climate change responses into national development processes. While recognising that countries have common but differentiated responsibilities in contributing to climate change, the focus of the adaptation activities is to achieve tangible results in African countries. The work primarily focuses on highly vulnerable ecosystems (drylands and low lying coastal lands), Small Island Developing States (SIDS) and megadeltas, to reduce vulnerability and increase resilience to climate change. On mitigation, the primary focus is on middle income, emerging and carbon intensive economies where the majority of gains can be realised.

The **UN Development Progamme's (UNDP) Africa Office** also coordinates the **Africa Adaptation Programme (AAP)**, which has been designed to support the long-term efforts of targeted countries to further develop their capability to successfully identify, design and implement holistic adaptation and disaster risk reduction programmes that are aligned with national development priorities. In this regard AAP is not a traditional adaptation programme per se – but a strategic initiative, aimed at creating an environment for more informed and capable adaptation decisions and practice in each country. The AAP was established under the Japan-UNDP Joint Framework for Building Partnership to Address Climate Change in Africa (UNDP and the Japan International Cooperation Agency (JICA), established at the Fourth Tokyo International Conference for Africa Development organised in Yokohama, Japan in May 2008) in partnership with the United Nations Industrial Development

Organization (UNIDO), the United Nations Children's Fund (UNICEF), and the World Food Programme (WFP). Under the AAP, development is considered the key to poverty reduction, and therefore development must be sustainable, and to be sustainable it must be resilient to all manner of threats, both climate and non-climate in origin. This is why 20 African countries have joined UNDP's Africa Adaptation Programme; they want to strengthen their abilities to deliver a development agenda that makes steady and secure progress towards the MDGs. Success in strengthening institutions and processes depends ultimately on the skills, knowledge and leadership of the people involved. Central to the AAP methodology is helping the participants from the 20 AAP countries develop the professional capabilities they need to succeed in their challenging work of bringing about change within their countries. The AAP focuses on strengthening five capacities that are crucial to designing and implementing a resilient development agenda:

1. Data and Information Management
2. Institutions and Leadership
3. Analysis and Implementation
4. Knowledge Management
5. Innovative Finance

Projects to build these capacities are being implemented by a national team in each of the 20 AAP countries. Each team is led by the host government and assisted by the UNDP office in that country. The Regional Team, based in Dakar, helps the National Teams build their capacities for development resilience through technical assistance provided in two streams: one responsive, the other strategic. The AAP's Media Capacity Building Project, based in Nairobi, supports the professional development of national journalists in each of the 20 AAP countries to increase their ability to inform and reflect public debate on development resilience within a changing climate and report on progress. A fundamental component of the AAP approach is to build strategic partnerships with organisations within Africa and around the world so as to extend and sustain the level of technical assistance necessary for the successful achievement of national project objectives within the 20 AAP countries (including for example AfricaAdapt, ACPC, UNDP Capacity Development Group, and WHO).

The **UN Human Settlements Programme (UN-HABITAT)** is the United Nations agency for human settlements. It is mandated by the UN General Assembly to promote socially and environmentally sustainable towns and cities with the goal of providing adequate shelter for all. The **Regional Office for Africa and the Arab States (ROAAS)** supports Africa and the Arab States region in implementing the Habitat Agenda, emphasizing its two main themes: "Adequate shelter for all" and "Sustainable urban development". Its mission is to promote the Habitat Agenda at the regional level through the implementation of the two Global Campaigns on Secure Tenure and Urban Governance. The office contributes to the strengthening of the normative capacity of UN-HABITAT and promotes its visibility at the regional level. ROAAS provides country and city partners with policy options, technical expertise, information management and supports their project implementation efforts. In all the regional and country programmes, the social, cultural and gender aspects are carefully considered. The office responds to local demand and helps to build knowledge in the field of human settlements and sustainable urbanisation through the exchange of experience and best practices. The regional office's approach is to develop institutional capacity in Africa and the Arab States through advocacy, fostering and expanding partnership, institutional development, training and application of norms advocated by the organization through operational activities. Through these activities, sustainable urban development and management using updated sustainable methodologies is advanced at country level. In addition to providing substantive technical support at regional, national and local levels, ROAAS assists in mobilizing financial resources for operational projects in order to upscale and multiply the impacts achieved in demonstration projects.

The **UN World Food Programme (WFP)** is the food aid branch of the United Nations, and

the world's largest humanitarian organization addressing hunger worldwide. From its headquarters in Rome and more than 80 country offices around the world, WFP works to help people who are unable to produce or obtain enough food for themselves and their families.

WFP's five objectives are:

1. Save lives and protect livelihoods in emergencies
2. Prepare for emergencies
3. Restore and rebuild lives after emergencies
4. Reduce chronic hunger and undernutrition everywhere
5. Strengthen the capacity of countries to reduce hunger

WFP's Office for Climate Change, Environment and Disaster Risk Reduction is supporting WFP country offices and governments in the development of comprehensive disaster risk management frameworks by linking early assessment, early warning, contingency planning, capacity building with contingent finance and innovative disaster risk transfer mechanisms. The overall goal of this approach is to provide a more comprehensive and integrated solution to translate early warning information into early response, enabling a shift from managing disasters to managing risk.

Closely linked with adaptation to climate change, the **UN International Strategy for Disaster Reduction (UNISDR)** is working closely with ECOWAS and other development partners to implement strategies and programmes for disaster risk reduction in line with the Hyogo Framework of Action. The framework's main focus is on encouraging and promoting local governments to incorporate environmental risk management into city plans in order to attain sustainable development. Once such instrument that was designed to build the technical capacity and resilience of local governments to disasters is the "Making cities resilient: My city is getting ready" Campaign with ten essential action points. 25 Local governments across Africa have already signed up to the Campaign and UNISDR strongly urges more African cities to sign and participate in this campaign.

Government bodies (ministries, agencies, offices, etc.) play a very important role as they provide the legal framework and a lot of financial and personal resources and are supposed to translate the international agreements and guidelines into action on the ground. One representative of the **Ethiopian government**, namely the **Ministry of Agriculture's Disaster Risk Management and Food Security Sector (DRMFSS)**, could be won for the project. He also serves as the national contact point for the **World Food Programme in the Ethiopia Country Office in Addis Ababa**. Established in 2009, the DRMFSS consists of the Early Warning and Response Directorate (EWRD) and the Food Security Programme Directorate and is responsible for the overall coordination and leadership towards the implementation of the Disaster Risk Management (DRM) approach taken on by the Government of the Federal Democratic Republic of Ethiopia in collaboration with its humanitarian partners. The new multi-sectoral and multi-hazard DRM approaches disaster management based on vulnerability profiles, thus enabling it to target potential and impeding disasters through a comprehensive response. Its aim is to articulate the underlying and associated causes and implications of disaster vulnerability in an attempt to help policy makers, planners, practitioners, and communities to design appropriate, targeted risk reduction and awareness, disaster management, and development of programmes (www.dppc.gov.et/Pages/about.html).

The number of NGOs involved in NH/DRR/CCA in Africa is obviously very high, ranging from global to local ones that form no homogeneous group. Among the most important ones are Local Governments for Sustainability (ICLEI), the International Federation of Red Cross and

Red Crescent Societies (IFRC), the International Development Research Centre (IDRC), Environment and Development Action in the Third World (ENDA-TM), Plan International, CORDAID, CARE and many more. For example, the German Development Institute mentions for Ethiopia alone 34 NGOs active in the field of Climate Change Adaptation. Again, below some more detail is given on those NGOs that have agreed to engage in the CATALYST Think Tank:

ICLEI – Local Governments for Sustainability, a steadily growing and widely recognised global association of more than 1220 cities, local governments and their associations, in 70 countries, plays a leading role in convening local governments in various international and United Nations forums related to sustainable development. On the ground ICLEI offers a wide suite of training and capacity building tools and projects, local sustainability planning and project implementation, exchange programmes, sharing of good practice and building leadership and networks in an urban context – all towards more sustainable, resilient and efficient cities and towns across the globe. ICLEI Africa, the **African Regional Office** for ICLEI and hosted by the City of Cape Town, South Africa, collaborates with the global ICLEI network and other regional offices around the world, in sharing tools, materials and strategies and good practices specifically designed and implemented at the local level. Our key work areas include the following: Energy and Climate Change, Water and Sanitation, Urban Biodiversity (Local Action for Biodiversity, LAB), Integrated Environmental Management and Sustainable Consumption and Production. ICLEI Africa has a growing membership of African cities, local authorities and their associations and currently works in 27 African countries.

The **International Federation of Red Cross and Red Crescent Societies (IFRC)**'s Africa Zone covers 48 countries in sub-Saharan Africa and is divided into six functional / geographical regions namely the Indian Ocean Islands (Mauritius), West Coast (Abuja), Sahel (Dakar), Central Africa (Yaoundé), East Africa (Nairobi), and Southern Africa (Johannesburg). The East Africa Regional Representation based in Nairobi works with and coordinates programming in Kenya, Tanzania, Uganda, Rwanda and Burundi Red Cross Societies. The East Africa Regional Representation acts as one of the two operational support hubs with provision for technical programme support upon National Societies (NS) request, as well as zone-level roles in key support services (including finance, logistics, information technology/telecommunication and human resources) and humanitarian diplomacy (including communications, resource mobilisation, and performance and accountability).

Their regional disaster management programmes will focus on strengthening capacities of the NS in disaster preparedness aimed at empowering communities to becoming more prepared and resilient to disaster. The key actions include capacity building for disaster prone areas in risk identification through risk awareness creation, strengthening institutional capacities in disaster preparedness and response through well-equipped and skilled disaster response teams and prepositioned stocks or relief items, improving the ability of vulnerable communities to predict and mitigate effects of disasters through effective and efficient response, developing and integrating appropriate food security interventions in disaster management programmes, as well as environment management interventions for vulnerable communities.

In the East Africa Region, the NS development programme will be geared towards strengthening local community, volunteer and youth capacities to address the most urgent situations of vulnerability. This will be achieved through deliberate effort to strengthen institutional structures and support systems at regional and branch levels, enhanced volunteer management to ensure sustainability and volunteer retention and strengthening governance and management leadership capacities at levels. The NS are also seeking to strengthen their capacities to effectively and efficiently deliver quality services to the most vulnerable persons in their respective countries of operation, improve their planning techniques, monitoring and evaluation as well as actively promote respect for diversity and human dignity, while reducing intolerance, discrimination and social exclusion in their programming.

AfricaAdapt is an independent bilingual network (French / English) focused exclusively on Africa. The Network's aim is to facilitate the flow of climate change adaptation knowledge for sustainable livelihoods between researchers, policy makers, civil society organisations and communities who are vulnerable to climate variability and change across the continent (http://www.africa-adapt.net). The activities use the latest web-based applications, face-to-face interactions, and other media for sharing resources, facilitating learning, and strengthening the African adaptation community. The online activities are complemented by a range of offline activities and services, including:

1. An innovation fund offering small grants for new approaches to knowledge sharing
2. Radio-based programming and dialogues in local languages, developed with community radio broadcasters across the continent
3. Face-to-face meetings bringing people together to exchange ideas and overcome challenges
4. Mobile alert service letting people without easy web-access know the latest news.
5. A CD-Rom and paper-based dissemination service for network news and resource

AfricaAdapt is collaboratively hosted by three African organisations, each of them having a dedicated Knowledge Sharing Officer (KSO) working for the network:

1. **ENDA Tiers Monde (Environment and Development in the Third World – ENDA-TM)** Dakar, Senegal, works to improve the tools of knowledge for initiatives linked to the environment and local development contributing to the search for alternative development possibilities. It is active in 21 countries and based in Dakar, Senegal. Its approach is to work in close partnership with community-based organisations and community movements. ENDA's Energy Programme focuses on access to energy and climate change.
2. The **Forum for Agricultural Research in Africa (FARA)** in Accra, Ghana, complements the activities of African national, international and sub-regional research institutions to promote agricultural innovation. It aims to reduce poverty in Africa through sustainable broad-based agricultural growth and improved livelihoods, particularly of smallholder and pastoral enterprises (FARA was not contacted for CATALYST).

The **Intergovernmental Authority on Development's (IGAD) Climate Prediction and Applications Centre (ICPAC)** Nairobi, Kenya, enables East African countries to cope better with risks associated with extreme climate variability and change through the provision of climate early warning information. It supports specific sectors to contribute to poverty alleviation efforts, environmental management and sustainable development, improving systems to share climate information and expands the climate knowledge-base to enable appropriate responses. The network is jointly funded by the UK Department for International Development (DFID) and the International Development Research Centre (IDRC) Climate Change Adaptation in Africa Programme.

Plan International is a global children's charity which operates in 50 countries across Africa, Asia and the Americas. It is made up of 21 national organisations responsible for raising funds and awareness in their respective countries. The organisation also provides training in disaster preparedness, response and recovery and has worked on relief efforts in many countries. Plan's work in Africa started in Ethiopia in 1974 and now covers 24 countries. From improving education to rolling out health programmes, they work with children and their communities to help break the cycle of poverty.

The strategic framework for Africa provides 5 important directions:

1. surviving and developing
2. protecting and preventing
3. communicating and participating
4. learning and advocating

5. promoting good governance.

CORDAID – The Catholic Organisation for Relief and Development Aid is a Dutch development agency operating worldwide. We fight poverty and exclusion in fragile states and areas of conflict and extreme inequality. In order to stand up for the world's poorest and most marginalised communities, we raise funds in the Netherlands as well as internationally. Cordaid's main expertise lies in:

1. Conflict Transformation
2. Health & Well-being
3. Entrepeneurship
4. Disaster Risk Reduction & Emergency Aid
5. Urban Matters
6. Community Managed Disaster Risk Reduction

Universities, other research institutions and scientific networks comprise of Ardhi University with its Institute for human settlement studies (IHSS) and its Disaster Management Training Centre (DMTC) in Dar-es-Salam (Tanzania), Addis Ababa University (Ethiopia), Université de Ouagadougou (Burkina Faso), Université Gaston Berger de Saint Louis (Sénégal), Université de Yaoundé I (Cameroun), the African Centre for Disaster Studies (ACDS, North-West University) in South Africa, the Partners Enhancing Resilience to People Exposed to Risks University Platform (Periperi U), the International Institute for Sustainable Development (IISD), the Institute of Environmental Studies (IES) in Zimbabwe, the African Centre for Cities (ACC, Cape Town, South Africa) and the Disaster Mitigation for Sustainable Livelihoods Programme (DiMP) which regards itself as Africa's most experienced disaster risk reduction capacity development and research centre. Of course, there are many more, and also temporal activities such as AURAN, PHREE, PURR, some of which have been contacted but replies are still pending.

The **Institute for human settlement studies (IHSS)** and the **Disaster Management Training Centre (DMTC)** are located at **Ardhi University** in Dar es Salaam, Tanzania. Today, academic activities at the university are generated in six schools: of Architecture and Design; of Construction Economics and Management; of Geospatial Sciences and Technology; of Real Estates Studies; of Urban and Regional Planning; and of Environmental Sciences and Technology. In 1979, the Centre for Housing Studies was established as joint project between the governments of Tanzania and the Netherlands. The centre has now grown into the Institute of Human Settlement Studies, which is involved in enhancing knowledge and practical skills related to the 'regularisation of informal settlements' with which Dar es Salaam is plentifully endowed

The **Ethiopian Institute of Architecture Building Construction and City Development (EiABC)** at **Addis Ababa University** was established in 1954. It is an autonomous institute of Addis Ababa University focusing on the built environment. It has 114 academic staff (10 expatriate) and approximately 2500 registered students. It offers three Bachelor, three Master of Science, and one PhD programme. The new institute was inaugurated on March 6, 2010. It will be a home for architecture, urbanism and construction technology and management that is focused on educating professionals and providing university-level knowledge to serve Ethiopia's needs. Therefore, the following missions are to be followed:

1. To educate prospective graduates, provide knowledge and develop skills in design, building technology, management, and planning for the field of architecture, the building industry, construction management, as well as city and town actors in the public and private sector.
2. To conduct technology-based applied research, projects and studies that are based on priorities that reflect the needs of the country, the regions, woredas, kebele and the private business.
3. To create an environment that is conducive to the cultivation of social skills and

entrepreneur-ship among students and staff
4. To serve as a model for other educational institutions within the country and provide them with the necessary technological education and advanced training
5. To cooperate with all relevant stakeholders in promoting and developing local, regional and national technological know-how

Founded in 1974, the **Université de Ouagadougou** (Burkina Faso) consists of seven Training and Research Units (UFR) and one institute. It plays a key role in the economic and offers educational, cultural and economic benefit to the country. The university is complemented by the Burkina Institute of Arts and Professions, the Environmental Technology and Sustainable Development Institute, and the Populations and Health Institute. In total, the university has approximately 20.000 students.

The **Université Gaston Berger de Saint Louis** (Sénégal) was the second national university in Senegal and founded in 1975. The university has approximately 6.000 registered students. It has six departments and three institutes. At the LEIDI laboratory, a master programme “territorial dynamics” is offered to geography students. With the objective to train specialists of territorial analysis, the focus is on targeted skills in:

1. Analysis of the organization of territories and societies
2. Control of theoretical and practical knowledge needed to manage the natural environment, rural and urban;
3. Control of tools and techniques of investigation and spatial analysis.

A different focus currently under development includes research of "Governance of the Territories of Water (GTE)”. The new research cluster is led by Dr. Adrien Coly and focuses on the following interests:

1. Ecosystems, biodiversity and protected areas
2. Water and development
3. Governance of the territories of water
4. Millennium challenges: Climate change, development, food security, water, cities and environment.

The **Université de Yaoundé I** (Cameroun) was founded in 1961. In 1993 following a university reform the University of Yaoundé was split into two (Université de Yaoundé I and Université de Yaoundé II) following the university branch-model pioneered by the University of Paris. The university was selected as the Central Africa node for the post-graduate Pan-African University, with an institute to study social and human sciences and governance. It currently has approximately 50.000 registered students. The University of Yaoundé is the mother university in Cameroon. Its bilingual nature and programme makes it a reference in both Central and West Africa. The university has available a number of research laboratories and a modern virtual learning centre. A number of partnership agreements with major African and European universities ensure high quality research and education. The partner for CATALYST is the École Nationale Supérieure Polytechnique (ENSP).

The current director, Prof Dewald van Niekerk, established the **African Centre for Disaster Studies (ACDS)** in January 2002 at the Potchefstroom University for Christian Higher Education (now **North-West University**, Potchefstroom Campus – see http://www.nwu.ac.za) within the School of Social and Government Studies. The Centre was moved to the Research Focus Area: Sustainable Social Development (now called Social Transformation) within the Faculty of Humanities, in October 2006. The ACDS aims to address the research as well as training and education needs in disaster risk within southern Africa and the wider African continent. Since 2002 the Centre has embarked on various research, training and consultancy projects at local, provincial, national as well as international level. The process lead to the development of a considerable network of

professionals in the multi-disciplinary field of disaster risk reduction. Currently, the educational focus of the ACDS is on post-graduate level. A number of Masters and PhD students are focussing their research on issues of disaster risk and is enrolled at the NWU through various disciplines (e.g. communication studies, policy studies, political science and public management and administration). Through this multi-disciplinary focus, the ACDS aims to bring home the fact that disaster risk is everyone's business.

Partners Enhancing Resilience to People Exposed to Risks University Platform (Periperi U) is a platform for university partnership to reduce disaster risks in Africa. It stands for 'Partners Enhancing Resilience to People Exposed to Risks' – with a special focus on advancing university action on risk and vulnerability reduction in Africa. In the past, international humanitarian assistance and appeals were viewed as the primary assistance mode for disaster-affected African countries and communities, and seldom engaged Africa's institutions of higher learning. Unfortunately, these efforts also discouraged the development of basic risk-related education, training and research capabilities at tertiary level, which, as Asia and Latin America have shown, are critical for context-appropriate vulnerability reduction and disaster risk management. The activities concentrate on the following areas:

1. Education for Pastoralists and Other Marginalized Communities
2. Food Security, Asset Building, and Wealth Creation
3. Disaster Risk Reduction and Climate Change Adaptation
    - Community Health and Wellness
    - Safe Schools to Off-Set Vulnerabilities and Increase Safety of Children
    - Bio-Intensive Gardening and Nutrition
    - Community Managed Disaster Risk Reduction
    - Women in Disaster Risk Reduction
4. Applied Learning
    - International Courses focused on hands-on application of the IIRR methodologies and experiences of community-led development
    - Capacity Building for Peer Organizations/Governments/Institutions
    - Capacity Building for Local Community Groups
    - WRITESHOPS
    - Research and Publications

From the private sector, the **Global Climate Adaptation Partnership (GCAP)** agreed to join the panel of the CTTM. GCAP is an international partnership of the world's leading climate and adaptation experts, providing a broad range of climate-related services to both government and commercial clients including consultancy, knowledge services and management as well as training. As the world of climate change matures, businesses and governments are increasingly engaging in efforts to determine sound yet complex climate adaptation solutions. These are set in a context of tough environmental standards and low carbon targets and involve a wide range of processes such as transformations in risk, deployment of early warning and response systems, achieving multi-stakeholder ownership and securing sustainable finance. The Partnership represents a powerful new force in the field of climate adaptation, providing a wide spectrum of solutions. Its distinctive approach is one which combines in-depth knowledge and access to vast amounts of climate data with strong operational and planning insight. Using this core method, GCAP develops solutions through an expanding network of offices located in regions where adaptation services are most in demand.

Other important stakeholders include foundations such as the German Heinrich-Böll Foundation, and in general traditional authorities, community-based organisations, churches and the media.

Due to the fact that a number of the CATALYST stakeholders come from Ethiopia and Addis Ababa is an important location for many African institutions, it was decided to organise the workshop for the African region in Addis Ababa. This decision was furthermore supported by existing and good contacts to Addis Ababa university, by a very likely event to be organised by the Ethiopian government on the occasion of the International Day of Disaster Reduction (13 October), by the synergies with the CLUVA project also working in Addis Ababa, and by the partnership between the two cities of Leipzig (base of UFZ) and Addis Ababa.

4.3 Early insights form the stakeholder consultation

What capacity development activities related to NH/DRR/CCA are offered by the CTTMs and for what purpose?

All CTTMs conduct a wide variety of capacity enhancement. Given the diversity of actors, their activities differ significantly in terms of staff involved, resources, topics and geographical coverage. The intergovernmental organisations cover the whole spectrum of development aid, humanitarian aid and support in all phases of the disaster risk management cycle and longer term risk reduction and climate change adaptation. For these purposes, specific offices, (temporary) programmes within and between organisations and partnerships exist. The Africa Office of ICLEI and its Climate Adaptation Programme employs 18 full time staff members, plus ca. 40 free lancers. Furthermore, some national government representatives and members of city administrations are regularly involved. Their working level may be across different spatial levels and sectors, or within one sector or group on just one level. Activities, such as action plans or how local governments succeed to make informed decisions, are assessed as good as possible (sometimes with the help of online tools). In larger projects actors go back to see whether they were successful. However, assessment is problematic as one would have to “wait for the next disaster”, which of course will always be unique so that comparability and progress is difficult. Another example is UNEP’s African Adaptation Programme, the AfricaAdapt initiative or the Global Disaster Reduction Facility of the World Bank.

Organisations such as UNDP, UNEP, UN ISDR, etc. and large NGOs such as the IDRC, ENDA-TM and CORDAID provide a plethora of guidelines, leaflets, assessment tools, monitoring reports, etc. Especially NGOs are involved in many projects that reach down to the local level, where face-to-face trainings seem to be the best form of capacity building. IFRC is working slightly differently, as they work exclusively through their network of national Red Cross societies. They provide their very large pool of mainly volunteers (300.000 – 500.000 volunteers are engaged daily in some sort of relief action in East Africa alone) with tool kits as common entry points (e.g. on sanitation, water, hygiene, disaster response, ABC of risk reduction, etc.).

However, the focus of such high-level organisations is on knowledge collation / production and management on an organisational / institutional level as key components of their capacity development activities. Furthermore, they act as funders and operate on a strategic level with local partners.

UN-HABITAT aims its activities on (1) the very high level humanitarian and development community at large, but also at the various UN focal points on country level, on (2) academia in the form of increasingly engaging with universities and developing syllabuses and (3) the member states that represent both donors and recipients. It focuses on prospecting programme formulation in post conflict / disaster areas, promotion of frameworks for urban crisis management, and on developing training materials.

Also the WFP has various channels of delivering capacity building for WFP, partner and government staff. For instance, they currently developing a DRR/M face-to-face training package as well as an online course and also building the capacity of beneficiaries in their

programmes through food-for-training activities. In addition, there is an online "programme guidance manual" that includes detailed information on DRR, among other issues. They are moreover about to launch an online platform (knowledge facility for resilience, food and nutrition security) with the purpose of sharing knowledge, good practice, link up practitioners and policy makers as well as to trigger discussions on resilience and other topics. This comes with face to face seminars. In many countries, WFP works with the various national disaster management actors to build their capacity in preparedness and beyond. This includes e.g. secondments and hard- and software support. In terms of research, WFP works closely with IFAD under the Weather Risk Management Facility and engages various institutions in exploring innovative risk transfer mechanisms such as index insurance. For these aims, WFP works in collaboration with key scientific institutions, such as the UK Met Office Hadley Centre, Columbia University's International Research Institute for Climate and Society (IRI) and the Climate Change, Agriculture and Food Security Research Theme (CCAFS) of the CGIAR to develop methods for analysing the impacts of climate risk (historical climate, current climate, future climate, and climate extremes) on food security and livelihoods. This information is used to identify the most at-risk populations, and to identify the types of interventions that would yield benefits in terms of improved food security and resilience.

UN ISDR supports national governments to design and implement national adaptation strategies and disaster reductions plans, but not yet in every country. For example, in Ethiopia UN ISDR is not very active yet, although the government is establishing task forces and risk profiles for each region are created. In many countries, capacity development is often initiated by an NGO or other external actors (e.g. European and American development agencies) and then a national, regional or local government / actor takes over. Still, a "dependency syndrome" is sometimes generated and many organisations almost compete with each other, carrying out many activities in parallel which are not always well coordinated.

It seems to be a common understanding that whilst considering the global and regional impacts of climate change, the actual work that makes a difference and would contribute to some changes for the better, needs to take place of the very local level. The (so far) few representatives in the Think Tank from national to local level, but mainly the researchers, are aiming their work – in contrast to the intergovernmental organisations – more towards this level. Often, the main actors directly concerned with NH/DRR/CCA are the Ministries of the Environment, municipal governments and their technical services, NGOs and universities. However, any action taken on the ground needs to involve local associations, especially the traditional authorities (e.g. tribal chiefs, elderly, etc.) which in turn requires "gate keepers" to access them. These stakeholders meet in (training) workshops that are mostly initiated by the government.

On the local level, further important channels through which information related to NH/DRR/CCA is transmitted are radio and television stations, local theatre groups (e.g. in Burkina Faso, which pass a message and deliver amusement at the same time), churches and mosques. In Tanzania, university staff deploys above all trainings and demonstrations of policy-makers, employees of municipality, technocrats and bureaucrats. Per year, approximately 30 to 50 persons within the CLUVA project and more people in other projects may benefit from these capacity enhancement activities. However, the performance of these activities is not yet assessed. Also in Ethiopia, the university provides capacity building to the municipality, to experts and obviously to students, mainly in the field of community planning. About 20 to 30 people – mostly from the municipality but also from the regional government – benefit from these activities per year. Again, the performance/impact of these capacity enhancement activities is not yet assessed. The situation is similar in St. Louis (Senegal).

The assessment of capacity building activities, namely their impact and efficiency, is a major issue that many organisations are increasingly addressing. Although there are examples where assessment is already done, this could be much improved.

What capacity enhancement content will CATALYST provide to the CTTMs, thus how could they benefit from the project? What would they like to learn from the project, in order to pass it on when conducting capacity building activities on their own right?

Among the things that are needed and which are seen as the most effective capacity building activities are:

1. trainings (for tools)
2. new methods
3. international study tours and exchanges of staff
4. support for baseline assessments (e.g. checklists where capacity development is needed and required).

Moreover, specific knowledge needed includes:

1. climate data
2. better understanding of risk concepts and of the complexity of climate change and disasters
3. databases that collect hazard impacts, etc.

A benefit that e.g. ICLEI Africa could gain from CATALYST is the exchange with other stakeholders, particularly from non-African regions which have a longer tradition of capacity building activities for NH/DRR/CCA, since ICLEI Africa is rather young. Tools and written guidelines are only used if the target audience has been included in their development. Also, web-based facilities are not very useful in Africa where the majority of people does not have regular access to the internet. It would make more sense to use mobile applications, television and the radio. It is thus advised to take this into account, especially for the training module (WP5), which is nevertheless regarded as very useful. In Burkina Faso, more information about actors and more collaboration and a general deepening of knowledge are needed.

For most interviewed researchers, the municipalities and the local government level could benefit most of the CATALYST project. It is important for those people to gain better knowledge on what to do on the ground with regard to CCA and DRR, also on a very operational and practical level. For Ethiopian stakeholders it is also very likely that the content developed in the CATALYST could be integrated in the capacity development activities, particularly reviews of other studies in NH/DRR/CCA and of the development of urban adaptation strategies. The most useful form of capacity enhancement for them would be the provision of guidance documents and – again – best practices. Furthermore, interviewees believe that the content developed in the CATALYST could be integrated in teaching at the graduate level, e.g. in the form of short hand-outs on evidence on benefits for taking action for technocrats and bureaucrats, and on the communal level with “good” examples.

WFP sees the potential of CATALYST for all levels, but a lot could be added to build the capacity at the national level, i.e. of governmental counterparts (and potentially regional bodies). Key is to make the right knowledge available at the right time and to the right people. A mechanism or institution for the coordination of these activities is essential, a view that is also shared by Periperi U.

Which topics (e.g. risk assessments, measures, proof of benefits, best practices, etc.) are relevant for the CTTMs? How do the themes envisaged in CATALYST's Description of Work (DoW) fit into CTTMs' activities and what focus should be given the highest priority in order to complement best the activities and capacity needs envisaged by the CTTMs?

In Senegal, the urban population seems to be most aware that one needs to fight against climate change impacts, although the local level is generally only little aware of the problems and the complexity behind disaster risk and climate change. Best practices of CCA and DRR and of how to build resilience would be much appreciated, thus insights on and examples of the ways other cities are planning DRR and CCA activities and how they attempt to adapt and reduce their vulnerability. Needed are also relevant guidelines on how to evaluate existing land-use plans, disaster preparedness plans and urban adaptation strategies and how to improve the situation. The following topics could help to improve the delivery mechanism or content of capacity development activities:

1. Hazard risks assessment, (social, economic) vulnerability and resilience, including the anthropogenic climate risk, are very relevant topics. It is particularly important to offer an overview in a common and easily understandable language. A first step would be to make politicians, practitioners and policy-makers aware of the problem. This is often not done as most actors are rather interested in a 'quick fix' of the problem, and comprehensive, integrative and systematic views (multidisciplinary approach) on the problems of NH/DRR/CCA are mostly neglected. Therefore the focus should be on interlinkages between the various "spheres" (?). Generally, guidance which is easy to understand and accessible would be very helpful.
2. Furthermore best practices (practical examples and case studies in the region of operation as well as desk reviews of best practices and lessons learned from other regions) as well as evidence on how to take hazards, vulnerabilities and risks into account and how to help to improve the situation are needed. Evidence-based risk management is fundamental, again with the key issue that bureaucrats need evidence to be encouraged to do something.
3. Disaster risk reduction measures and policies (at different levels - international, regional, national), including the institutional processes needed to deploy them successfully are very relevant – particularly for bureaucrats and policy-makers.
4. Comprehensive assessment of the benefits and 'disbenefits' of disaster risk reduction policies and measures, including their social acceptance, economic effectiveness, costs/benefits, uncertainty is very relevant – above all the documentation of best practices and what other communities facing similar challenges do about it. Particularly, evidence that certain practices actually make a difference is needed.
5. The assessment of training and capacity development activities is not yet or not often / thoroughly carried out – thus some guidance on that could be very useful.
6. A high added value would be provided by available and applicable methods and tools, such as mobile technologies.

What are key vulnerabilities, gaps, missed opportunities, and major (implementation) barriers for DRR and CCA in West and East Africa and what are existing potentials to build upon in the future?

Interviewees highlighted, through African specific local examples, how climate change is already causing an increase in the frequency of natural hazard events such as fires, heat stress, salinization and coastal erosion resulting from sea storm surges, sea level rise, flooding and drought. A specific natural hazard in Ethiopia, in addition to droughts and floods, are volcanic eruptions that also have more subtle effects like water contamination and eye itching. Many disasters are transitional in nature and trigger subsequent epidemics, refugees, and poverty.

The key vulnerabilities (including their drivers) concern social vulnerability, e.g. informal settlements due to rapid urbanisation, poverty and failure to provide basic infrastructure and services, vulnerable groups in marginal settlements, but also ecologic vulnerability, i.e. the protection of degenerating wetlands as well as the provision of ecosystem services is important. In a larger context the focus lies on urban areas, which however depend on the situation in rural areas as droughts and famine there trigger migration towards the cities, resulting in rapid urbanisation processes und highly vulnerable areas, such as informal settlements with overloaded or not existing infrastructure overloaded or without other basic services.

Obviously, vulnerabilities vary greatly from country to country. Next to other factors, droughts, floods, and (market and commodity) price fluctuations make up the bulk of vulnerabilities when looking at food and nutrition security. Conflicts, global and regional trade regimes need to be mentioned as well.

A remark by some actors was that a project like CATALYST does not stand alone in the field of research and development work in NH/DRR/CCA. It therefore needs a “unique selling point”, and in fact urban disaster risk management and the interface of high level programmes/policies and local action has the potential of being such a selling point. However, the concentration of disasters in Africa is still in the rural areas.

With respect to NH/DRR/CCA knowledge or capacity gaps include the lacking awareness of the problem as well as of a more integrative and systematic perspective among bureaucrats and policy-makers, the understanding that decisions taken today will have strong future impacts and heavily influence vulnerabilities, and systematic thinking that links DRR and CCA with planning as well as with economic, social and political developments and issues. Particularly on the local level climate change is not (yet) considered as a problem – “It does not affect us”. However, many organisations are dealing with NH/DRR/CCA, e.g. research projects municipal Departments of Environment or DRR Management Departments (if existing). In terms of specific knowledge needed, there seems to be a lack of awareness on the problem of DRR and CCA, i.e. the links between natural hazards and climate change and the urban vulnerability need to be better understood. Generally, people working on the local and regional level are most often not aware of the topic of vulnerability and what it means. Furthermore, it is unclear to them what the (economic) benefits and opportunities are to adapt now and not wait of disaster to occur. Thus, capacity development is desirable and important for understanding risk assessments related to climatic hazards. Especially for bureaucrats it needs to be made easily understood and accessible. Rather than guidance on developing or improving disaster preparedness plans, (new) land-use planning is needed that links to CCA and DRR. Relevant guidelines on how to evaluate existing plans and how to improve the general situation would be helpful.

Barriers for DRR/CCA work include difficult access of climate data, quick turn-over (especially in Africa) of staff in governments, language barriers, illiteracy, missing communication infrastructure, the fact that many processes are often organised by externals without indigenous knowledge, missing political will, a lack of resources and generally the complexity and uncertainty of the issues. One of the obstacles of successful and continuous capacity development is the fact that many activities are personality related – if key persons leave their position this could mean that the whole capacity building process needs to start over. This was highlighted also by ICLEI, namely that often the persons that were capacitated then have better chances for getting more lucrative jobs and leave their positions. In some areas, DRR/CCA are quite recent issues that most people are not aware of. The situation is a bit better on the federal level, whereas on the local/regional level much more complicated since there the topic plays hardly any role. Here, mostly a reductionist view with a focus on reaction and not on prevention prevails. In many countries, planning systems and capacity building are regarded as insufficient and weak and there is often a lack of interest/motivation even on a government level as well as corruption problems. Often, urban planners are not included in DRR/CCA planning. WFP summarises the barriers as e.g. insufficient evidence (what works and what not and why), funding (cost effectiveness study

and evidence could be a catalyst for increased availability of funding), capacity development (lack of effort and material), and commitment (policy and strategy context at all levels to be further developed).

There are also fundamental problems in aid: namely the structural separation between the rural and the urban realm, the separation between (short-term) humanitarian and the (longer-term) development funding. This proceeds in the sectoralisation / specialisation of aid: donors may pick up on certain issues where to help – e.g. UNICEF and child care are “easy to sell” to donating people, whereas other, more subtle work areas do not get enough funding for their longer term activities.

5 SOUTH AND SOUTH-EAST ASIA

5.1 Key vulnerabilities of the region

South Asia is home to around one fifth of the world's population, making it both the most populous and densely populated geographical region in the world. The economies of the area have performed strongly in recent years despite the impacts of the global economic recession. However, rapidly-increasing wealth is not being shared equitably within countries. South Asia has the largest concentration of poor people in the world, the highest rate of child malnutrition and the lowest income per capita. Based on current trends, the region will not achieve most of the MDGs. South Asia is also highly vulnerable to natural hazards, such as drought and floods, with Pakistan heaving large areas with recurring floods resulting from heavy rains. The increasing frequency and severity of such events have the potential to undermine water and food security and result in the massive displacement of vulnerable people.

Asia is a continent prone to the natural hazards of diverse nature. In South and South-East Asia the range and intensity of events are diverse. Hurricanes like Nargis, a tropical cyclone in the Gulf of Bengal in 2008, devastated the Irrawaddy Delta through wind and storm surge and cost the lives of more than 140,000 Burmese. The Philippines were drenched in 2009 by enormous amounts of rainfall. Southeast Asia suffered from drought in 2009–2010. The tsunami of 26 December 2004 killed more than 220,000 people in 13 countries around the Indian Ocean. As with floods, the water supply may be severely affected, coastal wells are submerged, surface water in tanks and shallow ground water is heavily polluted and rendered impotable. The shallow fresh groundwater along the coast becomes saline during tsunami, and it takes several weeks of pumping the degraded (polluted) ground water to restore its quality to drinking water standards. Bangladesh is highly vulnerable to disasters: there are annual floods and cyclones, erosion and salinization in the coastal regions, and drought periods in the winter months. Bangladesh is one of the countries of the global south that is most severely affected by the consequences of global climate change. Around 38% of the largest port megacities are found in Asia, 27% are located in deltaic settings, again mainly in Asia. Cities on deltas are at lower elevations and therefore tend to have a higher coastal flood hazard. In Bangladesh, where storm surges claimed 300,000 lives in 1970 and 139,000 in 1991, several thousand flood shelters, elevated structures to which people can flee when a surge inundates the land, have been built in the past two decades.

Rapid, global and human induced climate change is occurring with measurable impacts and is likely to intensify extreme weather events and consequently increases disaster risk. Many extreme events have occurred in South and Southeast Asia, for example serious and recurrent floods in Bangladesh, Nepal and India in 2002, 2003 and 2004, increased occurrence of flash floods in Vietnam, droughts associated with El Niño in Pakistan and India in 1999 and 2000, droughts in 1997 and 1998 causing massive crop failures, water shortage and forest fires in the Philippines, Laos and Indonesia, as well as a higher intensity of cyclones in the Bay of Bengal. Climate change can exacerbate disasters in this region, although it is important to note that disasters are a product of the interaction of the hazard phenomena and the vulnerability of societies exposed. On current trends climate change will negatively affect the agricultural and water resources sectors, as well as the coastal ecosystems in South and Southeast Asia, which characterize most countries in this region. Regional areas frequented by droughts need to be identified, for example some of the drought prone South/South East Asian countries where the monsoon periodically fails. Due to both the overflow from the Mekong River and heavy local rainfall, a large part of the Mekong delta is inundated in the wet season. However, in the dry season, the low discharge below the field level causes water shortage in the whole delta area. Overuse of water for irrigation and hydropower projects in upstream areas cause serious salinity intrusion and drought in the downstream region of the Mekong River. In a longer term, the problem of sea level rise and increased groundwater abstractions will impact millions of people living in

coastal areas and megacities and force them to find a way to adapt or migrate to other areas.

5.2 Core Think Tank Members of the South and South-East Asia region

Table 9: Core Think Tank members of South and South-East Asia region

	Acronym	Full name	country	Networks	Contact person	Type
Asia	UNESCO	United Nations Educational, Scientific and Cultural organisation	F	ICHARM	Bhanu Neupane	IO
Asia	ADPC	Asian Disaster Preparedness Centre	TH	UN/multiple	Aslam Perwaiz	IP
Asia	UNISDR	United Nations International Strategy for Disaster Reduction	TH	multiple	Hang Pham Thi Tang	IO
Asia	UN-ESCAP	United Nations-ESCAP Water Security Section	TH	UN/multiple	Salmah Zakaria	IO
Asia	CARE	CARE International	VN	multiple	Nguyen Thi Yen	NGO
Asia	UNDP	United Nation Development Programme	VN	UN/multiple	Bui Viet Hien	IO
Asia	ICIMOD	International centre for integrated mountain development	IN	research	Hari Krishna	NGO
Asia	Red Cross	Red Cross Netherlands / Red Cross Denmark	INT	Multiple/humanitarian	Anne Mette Meyer	NGO
Asia	MRCS	Environment Programme at Mekong River Commission Secretariat	LDP	research	Henrik Larsen	A
Asia	ICHARM	Global Centre of Excellence for Water Hazard and Risk Management	JP	research	Kuniyoshi Takeuchi	IO
Asia	BRAC	BRAC University Center for Climate Change and Environmental Research	BD	research	Nandan Mukherjee	A
Asia	UST	Unnayan Shahojogy Team (UST)	BD	multiple	Shah Md. Anowar Kamal	NGO
Asia	PSTU	Patuakhali Science and Technology University	BD	research	Mostafa Zaman	A

The **United Nations Educational, Scientific and Cultural organization (UNESCO)** works to create the conditions for dialogue among civilizations, cultures and peoples, based upon respect for commonly shared values. It is through this dialogue that the world can achieve global visions of sustainable development encompassing observance of human rights, mutual respect and the alleviation of poverty, all of which are at the heart of UNESCO'S mission and activities. As the UN's agency for science, UNESCO has been intimately involved in disaster reduction for the past 45 years, with studies on earthquakes and oceanography dating back to the 1960s. It has since expanded into many areas, as it pursues multidisciplinary actions to study natural hazards and mitigate their effect. Disaster preparedness and mitigation are among the key objectives in UNESCO's Strategy. Operating at the interface between education, science, the social sciences, culture and communication, UNESCO has a vital role to play in constructing a global culture of disaster risk reduction. The Organization is engaged in the conceptual shift in thinking away from post-disaster reaction to pre-disaster action. Through its broad mandate and expertise, UNESCO is helping countries to reduce their vulnerability to natural hazards and build their capacity to cope with disasters. Furthermore, UNESCO provides to governments practical and scientific advice on disaster risk reduction and a forum to work together to find solutions in this area. IPRED (International Platform for Reducing Earthquake Disasters workshop) will specifically examine the outcomes of recent major earthquakes: Indonesia in 2009, Chile and Haiti in 2010, and Japan and New Zealand in 2011.

Since its inception in 1986, the **Asian Disaster Preparedness Centre (ADPC)** has been recognized as the major independent centre in the region for promoting disaster awareness and the development of local capabilities to foster institutionalized disaster management and

mitigation policies. First, the centre aims to promote increased awareness, knowledge and adoption of disaster reduction practices as an integral part of the development process at community, national, sub-regional, regional and international levels of engagement. Secondly, ADPCs primary focus lies in helping countries, organizations, communities and individuals strengthen their own capacities in all respects to reduce the impacts of disasters. They believe that building strong local ownership through informed and motivated participation in disaster risk endeavours is the most assured way to sustain disaster risk reduction and ensure human development. Another crucial element in this respect is to translate scientific knowledge into cost effective and environmentally suited practices that are well understood by the communities concerned. In other instances successful activities proceed from the continued appreciation of elements derived from indigenous knowledge. As such, ADPC has worked to enhance capacities through the regular assessment of needs in the region and to develop specific, context-driven and appropriate capacity building products and services. ADPCs activities demonstrate a wide diversity in application, address various types of natural hazard-induced disaster risks, and cover all aspects of the disaster management spectrum from prevention and mitigation, through preparedness and response, to recovery responsibilities. ADPC have stated 12 thematic areas of focus:

1. Good governance and Disaster Risk Management Systems Development
2. Urban Disaster Risk Management
3. Climate Variability and Change/Climate Risk Management
4. Community-Based Disaster Risk Reduction
5. Public Health in Emergencies/Health Risk Management
6. Emergency Preparedness and Response System Development
7. Geological Hazard Risk Management
8. End to End Multi Hazard Early Warning Systems
9. Mainstreaming Disaster Risk Reduction into Development
10. Post-disaster Recovery and Reconstruction
11. Risk Assessment
12. Technological Hazard Risk Management.

Created in December 1999, **UNISDR** is the United Nations secretariat of the International Strategy for Disaster Reduction. It is the successor to the secretariat of the International Decade for Natural Disaster Reduction with the purpose of ensuring the implementation of the International Strategy for Disaster Reduction (General Assembly (GA) resolution 54/219). The mandate of UNISDR expanded in 2001 to serve as the focal point in the United Nations system for the coordination of disaster reduction and to ensure synergies among the disaster reduction activities of the United Nations system and regional organizations and activities in socio-economic and humanitarian fields (GA resolution 56/195). This was in response to a need for mainstreaming disaster risk reduction within the development and other areas of work of the UN. UNISDR's vision is based on the three strategic goals of the Hyogo Framework for Action: integrating DRR into sustainable development policies and planning, developing and strengthening institutions, mechanisms and capacities to build resilience to hazards, and incorporating risk reduction approaches into emergency preparedness, response, and recovery programmes. UNISDR leads the preparation and follow-up of the Global Platform for Disaster Risk Reduction, establishment in 2006 (GA resolution 61/198). The Global Platform has become the main global forum for disaster risk reduction and for the provision of strategic and coherent guidance for the implementation of the Hyogo Framework and to share experience among stakeholders. Other areas of work for UNISDR includes issuing the Global Assessment Report on Disaster Risk Reduction every two years, supporting countries in monitoring risk trends and the implementation of the Hyogo Framework for Action, and leading global campaigns on disaster risk reduction for safer schools, safer hospitals and safer cities.

The **United Nations Economic and Social Commission for Asia and the Pacific (UN-**

ESCAP) is the regional development arm of the United Nations for the Asia-Pacific region. With a membership of 62 Governments, 58 of which are in the region, and a geographical scope that stretches from Turkey in the west to the Pacific island nation of Kiribati in the east, and from the Russian Federation in the north to New Zealand in the south, ESCAP is the most comprehensive of the United Nations five regional commissions. It is also the largest United Nations body serving the Asia-Pacific region with over 600 staff. Established in 1947 with its headquarters in Bangkok, Thailand, ESCAP seeks to overcome some of the region's greatest challenges. The Committee on Disaster Risk Reductions addresses the following issues:

1. Policy options and strategies on multi-hazard disaster risk reduction and mitigation
2. Regional cooperation mechanisms for disaster risk management, including space and other technical support systems
3. Multi-hazard assessment, preparedness, early warning and response to disaster risks

CARE International has committed to supporting the world's most vulnerable people in their efforts to adapt to climate change. They use their global network of people and partner organizations to build understanding of the impacts of climate change on poor and marginalized people; to identify and promote effective and equitable responses at international, national and local levels; and to empower vulnerable communities and people to take action. They are particularly concerned with ensuring that women and men are able to access the same resources, opportunities and benefits in adaptation processes. CAREs strategy recognizes the critical role that knowledge plays in this process. As part of our effort to build and share our knowledge in support of effective adaptation, CARE has undertaken a reflection process on vulnerability to climate change. This process draws on our experience working with vulnerable people around the world to reduce poverty and achieve social justice, supplemented by targeted analysis of vulnerability to climate change. This analysis was undertaken using the methodology described in the Climate Vulnerability and Capacity Analysis (CVCA) Handbook, which was developed to help CARE staff and partners to understand the challenge of climate change vulnerability and to identify appropriate adaptation responses for the most vulnerable people.

The **United Nations Development Programme (UNDP)** is the UN's global development network, advocating for change and connecting countries to knowledge, experience and resources to help people build a better life. We are on the ground in 177 countries and territories, working with governments and people on their own solutions to global and national development challenges. As they develop local capacity, they draw on the people of UNDP and our wide range of partners that can bring about results. World leaders have pledged to achieve the Millennium Development Goals, including the overarching goal of cutting poverty in half by 2015. UNDP's network links and coordinates global and national efforts to reach these Goals. Our focus is helping countries build and share solutions to the challenges of:

1. Democratic Governance
2. Poverty Reduction
3. Crisis Prevention & Recovery
4. Environment & Energy
5. HIV/AIDS

The **International Centre for Integrated Mountain Development (ICIMOD)** aims to assist mountain people of the greater Himalayas to understand changes caused by globalization and climate change – how these changes affect their livelihoods and how to adapt to them. Through consultations with the member countries and the stakeholders, three key strategic areas have been identified: integrated water and hazard management, environmental change and ecosystem services, and sustainable livelihoods and poverty reduction. The overall goal of the integrated water and hazard management project is to contribute to reducing vulnerability and risk and build their resilience to water-induced disaster risks. This

is done e.g. by enhancing capacity and awareness of regional member country partners in DRR and help to address their DRR needs along with contributing to improve regional member country partners DRR planning activities by increasing connectivity through knowledge sharing.

The **International Committee of the Red Cross (ICRC)**, established in 1863, works worldwide to provide humanitarian help for people affected by conflict and armed violence and to promote the laws that protect victims of war. An independent and neutral organization, its mandate stems essentially from the Geneva Conventions of 1949. Based in Geneva, Switzerland, it employs some 12,000 people in 80 countries; it is financed mainly by voluntary donations from governments and from national Red Cross and Red Crescent societies. The work of the ICRC is based on the Geneva Conventions of 1949, their Additional Protocols, its Statutes – and those of the International Red Cross and Red Crescent Movement – and the resolutions of the International Conferences of the Red Cross and Red Crescent. The ICRC is an independent, neutral organization ensuring humanitarian protection and assistance for victims of war and armed violence. It takes action in response to emergencies and at the same time promotes respect for international humanitarian law and its implementation in national law. The ICRC is committed to responding rapidly and efficiently to the humanitarian needs of people affected by armed conflict or by a natural disaster occurring in a conflict area.

The **Environment Programme at Mekong River Commission Secretariat (MRCS)** is an inter-governmental agency that works directly with the governments of Cambodia, Lao PDR, Thailand and Vietnam on their common specific interests – joint management of shared water resources and sustainable development of the Mekong River. MRCS Serves its member states with technical know-how and basin-wide perspectives and does hereby play a key role in regional decision-making and the execution of policies. MRCS has placed regional cooperation and basin-wide planning at the heart of our operation. The agency engages a wide range of stakeholders into its programme work and strategic planning. The two upper states of the Mekong River Basin, China and Myanmar, are dialogue partners with the MRCS. MRCS consist of three permanent bodies: The Council, the Joint Committee, and the Secretariat. In 2011 two key strategies where endorsed, one that provides regional and transboundary perspectives for basin development planning, representing over a decade of collaboration between member countries on their shared understanding of the river's opportunities and risks associated with development. A second to provide a platform for the MRCS's plan to decentralise core functions of the MRCS to the national level. MRCS was established in 1995 and comprises of 150 staff members.

The **Global Centre of Excellence for Water Hazard and Risk Management (ICHARM)** has actively involved in Research, Training and Information Networking in an integrated manner. It promotes a wide range of activities, including local studies to realize an appropriate flood-risk management cycle, the development of a satellite-based flood forecasting system, research on flood risk assessment and adaptation strategies to cope with possible global climate change and various training courses such as the one-year Master's course on water-related risk management. They responds to such increasing severity of water-related hazards worldwide, the United Nations and UNESCO have embarked on many initiatives; the International Decade for Natural Disaster Reduction (IDNDR 1990-1999) to increase awareness of the importance of disaster reduction, the International Strategy for Disaster Reduction (ISDR) and the World Water Assessment Programme (WWAP). In accordance with such policy development, the International Flood Initiative (IFI) to promote collaborative activities for effective flood management was jointly launched by UNESCO. Under such circumstances, the proposal by the Japanese government to establish an international center for water-related hazards under the auspices of UNESCO hosted by the Public Works Research Institute (PWRI) was approved by 191 Member States at the 33rd General Conference of UNESCO in October 2005.

BRAC was established in 1972 and over the history of time it has become the largest NGO in the world. BRAC has extensive field experience in the sector of poverty alleviation, women

empowerment, micro-finance, education, health, disaster management and climate change over the last few decades. BRAC has its own unit of Disaster Management and Climate Change. BRAC established the BRAC University in 2001 as a sister concern to perform the inter-sectoral and inter-disciplinary modes of research and education. BRACU has been running a special Masters Programme in Disaster Management and offered two courses on climate change in the postgraduate programme. Since after the inception, BRACU has conducted series of cross-sectoral research on climate change and disaster management in direct collaboration with BRAC. To coordinate and manage these different activities, the Syndicate and the Board of Trustees of BRAC University have accorded for establishment of a research center titled "Centre for Climate Change and Environmental Research" (C3ER). Resources and expertise available in the departments, schools and institutes of the university has been mobilized specially in the field pertinent to adaptation and mitigation. Special attention has been given to research in the area of adverse impact of climate change on health, food security, poverty and livelihood, displacement and migration, loss and damage assessment, renewable energy, negotiation process, technology transfer, education and awareness etc. In addition to this, C3ER has already arranged a number of trainings and public lectures on climate change and disaster management in association with other departments of BRAC University.

The **Unnayan Shahojogy Team (UST)** is a national NGO, working in Bangladesh since 1986. It mobilizes available resources for the benefits of the rural poor, especially for the disadvantaged women and children. UST also works at grass root level with civil society for strengthening local governance towards sustainable development. The vision of UST is being materialized through achievements of Shabolombee Gram (Self-reliant Village) that means ensuring social justice, peace, empowerment of poor people, poverty reduction, access to resources to meet basic needs, rights of all segments of people over health education and livelihood. UST has notable experience in disaster preparedness and risk management program especially, in the areas of long term and short-term disaster management. In this regard, UST provides education and training to the people to enhance their capacity with regard to mobilization of local resources and emergency relief when it is necessary. UST has experience of working with flood, cyclone, draught and tornado and Monga (temporary famine) victims. UST has been working with the local people to promote their knowledge and holistic skills by means of training and education for long term solution. UST believes that decentralization of authority among the senior staff will help to develop a solid foundation for an efficient management system to ensure accountability and transparency at all level from decision making at top management to implementation of activity at field level.

Patuakhali Science and Technology University (PSTU) is located in Bangladesh and today has a Faculty of Disaster Management. It started with a programme that was first introduced in the year 2009 by the Department of Environmental Science and Disaster Management (DESDM), which was established in 2009 at Patuakhali Science and Technology University (PSTU) and this is the first institutions to offer multidisciplinary degree in this specialized and rapidly growing academic discipline in Bangladesh and in the region. In 2009, the program became the first degree program to receive accreditation on a national level from the University Grants Commission (UGC), Bangladesh. To meet the challenges of globalization by raising the quality of University level education and research to the world standards, on 21st August 2011 the DESDM was upgraded to a full-fledged faculty named "Faculty of Disaster Management".

5.3 Early insights form the stakeholder consultation

What capacity development activities related to NH/DRR/CCA are offered by the CTTMs and for what purpose?

The CTTMs involved in the South and South-East Asia region provides capacity development that includes activities at many different levels and whose actions have very different scopes. The CTTMs comprise both of IO, NGOs and academia. E.g. Asian Disaster Preparedness Centre (ADPCs) activities demonstrate a wide diversity in application, it address various types of natural hazard-induced disaster risks, and cover all aspects of the disaster management spectrum from prevention and mitigation, through preparedness and response, to recovery responsibilities. The International Centre for Integrated Mountain Development (ICIMOD) also deals with prevention by enhancing capacity and awareness of disaster risk reduction (DRR) and helps to address DRR needs along with contributing to improve DRR planning activities by increasing connectivity through knowledge sharing. But in contrary to ADPC, ICIMOD focus their activities toward mountain people of the greater Himalayas. United Nations-ESCAP Water Security Section focuses on training of training (TOT) workshops and expert group meetings related with issues such as flood management and climate change adaptation etc. Invitees are typically from Asia and the Pacific and Arab regions. UNISDR as the Secretariat for the International Strategy for Disaster Reduction carry out research jointly with NGOs, engaging Government agencies in workshop/meeting, engaging local governments in Disaster Risk Reduction Campaign such as making cities resilient, safe schools and hospitals. They work with various partners ; Government focal points for the Hyogo Framework for Action, UN agencies, research institutions, NGOs, Inter-governmental organizations such as ASEAN and SAARC and others.

What capacity enhancement content will CATALYST provide to the CTTMs, thus how could they benefit from the project? What would they like to learn from the project, in order to pass it on when conducting capacity building activities on their own right?

UN-ESCAP suggests that knowledge about land use planning and flood zoning, management of floods, landslides, pollution management and control as well as vulnerabilities and resilience from specific climate change impacts would be useful in this region to improve capacity development. UNISDR suggests that CATALYST would complement well the efforts in the region by looking at risk perception by local government, local governance for risk reduction and existing capacity/areas for development to address key elements of disaster risk reduction, integration of DRR in local development planning/budgeting and the evolvement of Community-based DRR initiatives. The Mid-term Review of the Hyogo Framework of Action indicates that while progress is being achieved at national level, it is far behind at local level.

Furthermore organizations in this region agree that guidance on finding and accessing information including from scientific sources is desirable. Through questionnaires it is found that both best practice, available knowledge and capacity development activities would be useful in this region, but that the priority of the three depends on the specific location. For example ICIMOD suggests that in the Himalayan mountain areas, capacity development activities coupled with best practices would work well. Moreover the organizations suggest that CATALYST would be a great platform for activities such as best practices, available knowledge and capacity development, particularly if it does not have any hidden agendas.

Which topics (e.g. risk assessment, measures, proof of benefits, best practice etc.) are relevant for the CTTMs? How do the themes envisaged in the DoW fit into CTTMs' activities and what focus should be given the highest priority in order to complete best the activities and capacity needs envisaged by the CTTMs?

The CTTMs were asked which of the following topics could improve the delivery mechanism

or content of capacity enhancement activities conducted by their organizations or networks:

1. Hazard risks assessment, (social, economic) vulnerability and resilience, including the anthropogenic climate risk;
2. Disaster risk reduction measures and policies (at different levels - international, regional, national), including the institutional processes needed to deploy them successfully;
3. Comprehensive assessment of the benefits and 'disbenefits' of disaster risk reduction policies and measures, including their social acceptance, economic effectiveness, costs/benefits, uncertainty;
4. Role of scientific knowledge in disaster risk reduction: evidence-based policy making, evidence-based risk management, role of experts and/or scientific panels and advisory boards;
5. Design and assessment of training and capacity enhancement activities.

All of the above stated topics were categorized as very important for the South and South-East Asia region. UN-ESCAP stresses the necessity to include local limitations and cultures to ensure effectiveness and improvements. UNISDR emphasize that while progress is being achieved at national level, it is far behind at local level.

What are key vulnerabilities, gaps, missed opportunities, and major (implementation) barriers for DRR and CCA in the South and South-East Asia region and what are existing potentials to build upon in the future?

There seems to be agreement amongst organizations that lack of knowledge in these issues is the greatest problem. Lack of risk perception, indifferent attitude towards risk and arrogance at all levels, either in perceived superiority of governance/leadership, capacity/skills and availability of resources-finance, human resource and fast growing economies which create more risks through unsustainable use of natural resources and investment decisions. Other problems stated in the submitted questionnaires are rapid urbanization and thus high population density in hazard prone areas, poor land use planning, disastrous floods, water pollution and landslides. Moreover inadequate infrastructure in rural areas was mentioned. Near developed countries need to co-ordinate their actions among their agencies. UN-ESCAP finds that economic development planning needs to be looked together with national physical plans. These may be missing in most developing and under develop countries which need to be considered for better effectiveness. UNISDR suggest that given the short time frame of CATALYST, it will be useful to focus on one or two critical gaps in the region. Furthermore they state that it's always difficult to convince investments on long-term prevention. There is no methods available yet to measure the cost-benefit of DRR investment. There is the need for better understanding of the need and social demand for long-term vision in planning and making development choices in the context of scarce resources and many competing priorities.

When UN-ESCAP is asked about existing climate adaptation initiatives they answer that these are extremely inadequate. They state the following problems with the governance and with technical problems respectively.

Governance:

1. Available mostly in generic policies. Minimal specifics on implementations.
2. Lack of awareness of impacts even among policy decision makers. The once affected, mostly those at the local levels, hardly know what climate change impacts are and how it can impact them. Still a lot of sceptics.
3. Lack of finance.

Technical:

1. Limited climate change projections on impact. The need for extended coverage of climate change projection to identify vulnerabilities and nurture resilience
2. Existing processes (e. g. IRBM – Integrated River Basin Management) are in the policies but implementations are usually not monitored with key performance indicators (KPIs)

6 CENTRAL AMERICA AND CARIBBEAN

6.1 Key vulnerabilities of the region

Central America is one of the most disaster-prone regions of the world (Uribe et al. 1999). Four out of eight Central American countries are ranked among the 40th most risk prone areas globally in terms of GDP (Table 4). The El Niño Southern Oscillation phenomenon affects the weather in the region, changing rainfall patterns and resulting in drought or intensive rains.

The region is located on three active tectonic faults (the Cocos, Caribbean and Nazca plates), has some 27 active volcanoes, and extends in the western extreme of the Caribbean hurricane belt. Some 49 tsunamis are reported along the Caribbean and Pacific coasts of Central America between 1539 -1996, the highest one being the Nicaraguan Tsunami (sea waves with heights of 9.5 m) in 1992 (Fernandez et al. 2000). Most events were generated by the Cocos-Caribbean Subduction Zone. The El Niño Southern Oscillation phenomenon affects the weather in the region, changing rainfall patterns and giving rise to drought or intensive rains. Mountainous terrain and complex river basin systems are susceptible to landslides and floods.

The region extends between the North Atlantic and Northeast Pacific basins' tropical cyclone activity. In 1998, hurricane Mitch, whose devastating effects were felt all across the Central America, became a symbol of the region's vulnerability. Equivalent of a year's worth of precipitation brought in less than a week triggered an overflow of rivers, floods, mudslides and landslides, killing some 10,000 people and causing damage for billions. In a single disaster strike, decades of development efforts in the region had been lost. In recent years, the 2005 Atlantic Hurricane Stan hit Guatemala, El Salvador, Nicaragua and Costa Rica, causing 1,500 deaths and economic damage of USD 3 billion (2005 estimation). In 2010 the Atlantic hurricane basin has seen 19 named storm, 12 hurricanes and 5 major (category 3+) hurricanes, causing up to November 6th economic damage of more than 10 billions USD. The Pacific coast has been plagued by 7 named storms (notably Agatha), 3 hurricanes and 2 major hurricanes, wracking havoc and causing a damage of more than 2 billion USD. The first tropical cyclone of the 2010 Pacific hurricane season, Agatha, has become known as one of the deadliest storms since the 1982 (category 2) Pacific hurricane, Paul. Agatha hit El Salvador, Nicaragua, Guatemala and Honduras, triggering catastrophic flooding and a damage of more than USD 1 billion.

Table 10: Countries at Relatively High Economic Risk from Multiple Hazards. (Based on GDP; two or more hazards). Source: The World Bank, 2005, Natural Disaster Hotspots, A Global Risk Analysis.

Country	Rank	Percent of total area at risk	Percent of population in areas at risk	Percent of GDP in areas at risk
El Salvador	2nd	88.7	95.4	96.4
Guatemala	5th	52.7	92.1	92.2
Honduras	40th	19.9	56.0	56.5
Nicaragua	26th	21.6	68.7	67.9

The legacy of civil war, violence and terror has devastated the region and caused high economic strain and social displacement. The environmental changes the region underwent over the past decades and the transformation of primary ecosystems into farmlands and irrigated crops accentuated communities' vulnerability to natural disasters. These environmental changes are still in place and will likely be accelerated as climate change goes forward. Hence, there is an urgent need to stop ecosystem degradation and enhance the capacity of communities and civil societies to cope with disaster risk and future climate

change. It is well recognised that environmental degradation poses a serious threat to developing communities, undermining the efforts and prospects for long-term economic and social development. It is equally well recognised that protecting the environment has high economic and social returns.

The economies of the sub region are primarily based on agriculture, hydropower and fisheries, making these areas particularly vulnerable to natural hazards. These last can also affect critical sectors like food and clean water availability, worsening health conditions and contributing to poverty. The low national per-capita GDPs of countries in the region suggest that most of them would be unable to avoid or absorb the economic consequences of severe climate change impacts.

Caribbean Small Island Developing States (SIDS) face a particular set of economic, environmental and developmental challenges that make them especially vulnerable to the effects of climate change, sea level rise and extreme events. The IPCC reports in fact explicitly identify SIDS as a “hotspot” area where climate change effects are present or imminent and where urgent action is required in the water sector. The characteristics of SIDS constrain both effective management of the water sector; parallel to this is the pattern of demand for water resources in SIDS. Water demand can be intensified due to a supreme economic reliance of many SIDS on water-intensive industries such as the tourism sector, and to a lesser extent the agricultural sector, as their main developmental option. At the community level, many coastal livelihoods can be closely linked to these industries. The issue of water governance in SIDS is also a highly complex one due to specific political, cultural, post-colonial practices. There is therefore a critical need for research on SIDS that seeks to minimise the impacts of climate change impacts on human livelihoods through analyses of these types of SIDS specific issues.

6.2 Core Think Tank Members of the Central America and Caribbean Region

Table 11: Core Think Tank members of Central America and the Caribbean region. * MoU not yet received

	Acronym	Full name	country	Networks	Contact person	Type
CAC	IUCN	International Union for Conservation of Nature	CH	CEM, ELAN	Karen Sudmeier, Radhika Murti	NGO
CAC	WB	World Bank	USA	multiple	Federica Ranghieri	IO
CAC	CCCCC	Caribbean Community Climate Change Centre	BZ	research	Kenrick Leslie	A
CAC	UNU-EHS	United Nations University, Institute for Environment and Human Security	DE	PEDRR	Fabrice Renaud	A
CAC	CIMA	Foundation CIMA, The Italian National Civil Protection Agency	IT	UN Global Compact	Nicola Rebora	A
CAC	REDESClim	Red de desastres hidrometeorológicos y climáticos; Network on hydrometeorological and climatic disasters	MX	network	Tereza Cavazos	NP
CAC	PINCC	Research Programme for Climate Change, at the National Autonomous University of Mexico	MX	multiple	Carlos Gay	A
CAC	DDRC	West Indies Disaster Risk Reduction Centre (DRRC), West Indies University (UWI)	TT	UN-SPIDER	Barbara Carby	A
CAC	CDEMA*	Caribbean Disaster and Emergency Management Agency	BB	multiple	Jeremy Collymore	NP
CAC	PFC	Programme for the strengthening of Risk Management Capacities in Central America	ES		René Ramos Gross	NGO
CAC	CHRR	Columbia University, Center for Hazards and Risk Research	USA	multiple	Ebu Grencer	A
CAC		"Redes de Gestión de Riesgos y Adaptación al Cambio Climático	LA	network	Dalia Carbonel Ramos	NGO
CAC		Infinita Consulting	MX		Gonzalo Roque	SME

Beyond the organizations and networks listed above, other important players in the field of NH/DRR working in the CAC region have shown deep interest in CATALYST and are willing to take part in the project's activities as core members. Because of previous engagements, consultations have been conducted recently and their affiliation will be finalised in the next weeks. These Organizations are:

1. The Caribbean Risk Management Initiative – UNDP, in the person of Mr Howie Prince;
2. Economic Commission for Latin America and the Caribbean, sub-regional headquarters in Mexico, in the person of Mr Ricardo Zapata;
3. Wetlands International.

A brief description of the organizations and networks formally involved in CATALYST's activities follows.

The **International Union for Conservation of Nature (IUCN)** works on biodiversity, climate change, energy, human livelihoods and greening the world economy by supporting scientific research, managing field projects all over the world, and bringing governments, NGOs, the UN and companies together to develop policy, laws and best practice. IUCN is the world's oldest and largest global environmental organization, with more than 1,200 government and NGO members and almost 11,000 volunteer experts in some 160 countries. IUCN's work is supported by over 1,000 staff in 45 offices and hundreds of partners in public, NGO and private sectors around the world. IUCN DRR activities at the global level include coordination and communications about DRR across IUCN, collecting and disseminating lessons learned

about projects and processes that integrate ecosystem management, sustainable livelihoods and disaster risk reduction at the regional level. IUCN regional offices are in the forefront of developing innovative approaches to watershed management, institutional capacity building and collaborative project that integrate disaster risk and climate change adaptation. IUCN supports shifting disaster risk management from reaction to prevention and placing sustainable ecosystem management for livelihoods at the centre of disaster risk reduction strategies.

The **World Bank** has been involved in post-disaster recovery and reconstruction for more than 25 years, with a trend toward increasing lending for risk reduction and mitigation, mainly by integrating risk reduction into investment programs. Natural disaster assistance accounted for 9.4 percent of total World Bank commitments between 1984 and 2005. This share has been increasing steadily over the years. In the last four fiscal years alone, the Bank has approved $9.2 billion for more than 215 disaster-related projects, including non-lending technical assistance. The Bank continues to invest in disaster risk reduction, including mitigation and disaster preparedness, as an integral component of poverty reduction and sector strategies. Bank policy for rapidly responding to crises and emergencies was revised in 2007 and the procedures streamlined, enabling a quicker response while integrating disaster risk reduction into project design. Under the revised rapid response policy, 16 projects have been approved, reflecting the Bank's emphasis on integrating disaster risk reduction into development strategies in high-risk countries and across sectors. In this connection, the World Bank's Disaster Risk Management team aims to reduce human suffering and economic losses caused by natural and technological disasters. This is done by helping the World Bank provide a more strategic and rapid response to disasters and promoting the integration of disaster prevention and mitigation efforts into the range of development activities.

The **Caribbean Community Climate Change Centre** coordinates the Caribbean region's response to climate change. Officially opened in August 2005, the Centre is the key node for information on climate change issues and on the region's response to managing and adapting to climate change in the Caribbean. It is the official repository and clearing house for regional climate change data, providing climate change-related policy advice and guidelines to the Caribbean Community (CARICOM) Member States through the CARICOM Secretariat. In this role, the Centre is recognised by the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Environment Programme (UNEP), and other international agencies as the focal point for climate change issues in the Caribbean. It has also been recognised by the United Nations Institute for Training and Research (UNITAR) as a Centre of Excellence, one of an elite few. Through its role as a Centre of Excellence, the Centre is aimed at supporting the people of the Caribbean as they address the impact of climate variability and change on all aspects of economic development through the provision of timely forecasts and analyses of potentially hazardous impacts of both natural and man-induced climatic changes on the environment, and the development of special programmes which create opportunities for sustainable development.

The **United Nations University Institute for Environment and Human Security (UNU-EHS)**, established in December 2003,is part of the UNU system, a worldwide network of Research and Training Institutes. Its mission is to advance human security through knowledge-based approaches to reducing vulnerability and environmental risks. The Institute explores problems and promotes solutions related to the environmental dimensions of human security, a concept which puts the individual, social groups and their livelihoods at the centre of debate, analysis and policy. UNU-EHS aims at scientific excellence in two broad thematic areas: i) Vulnerability assessment, resilience analysis, risk management and adaptation strategies within linked human-environment systems; and ii) Internal displacement and transboundary migration due to environmental push-factors. The interdisciplinary research examines the impacts of major drivers affecting human security, such as rapid- and gradual-onset environmental change – including climate change. The drivers include phenomena, such as floods, desertification and land degradation, water depletion and water quality deterioration, and a range of climate change impacts. The research explores ways to

improve human security through vulnerability reduction, disaster risk management and adaptation strategies.

Cima Foundation – the **International Centre on Environmental Monitoring** is a private non-profit research organization, founded by the Civil Protection Department of the Italian Prime Minister's Cabinet Office, the University of Genova, the Government of the Region of Liguria, and the Administration of the Province of Savona. The aim of CIMA Foundation is to advance science and engineering in environmentally related fields, focusing on public health and safety, civil protection and the preservation of terrestrial and water-related ecosystems. This aim is accomplished through scientific research, technology transfer and high level training services.

The Foundation promotes and develops scientific knowledge directly through its research staff, and indirectly through consultants, Universities, Research Organizations and other Research Foundations. Specifically, the Foundation supports and promotes research, technological development, higher education, professional background improvement and the development of institutional competences in areas such as hydrology, hydrogeology, hydraulics, atmosphere and ocean dynamics, meteorology, hydrometeorology and climatology, earth observation, evaluation and management of natural, industrial and man-made risk, the evaluation of the impact of climate variability on environmental systems, ecosystem modelling, environmental chemical processes, renewable energy sources, environmental remediation, environmental law, complex systems dynamics including complex social system dynamics. The Foundation realizes its mission by, performing basic and applied research, and publishing results; designing and implementing prototype projects; organizing short courses, workshops, and summer schools; providing research training for doctorate and graduate students; supporting doctoral and post-doctoral research positions; establishing collaborative research and exchange programs and hosting visiting scientists.

REDESClim is a thematic network constituted in 2011 within the National Council of science and technology (CONACyT), aimed at coordinating the collaboration of researchers, technologists, businessmen, politicians and the society in general to promote solutions for the problem of natural disasters in Mexico. REDESClim is an effort of the Academic Community to improve Mexico's response capacity to hydro-meteorological and climate disasters. This is done through:

1. Supporting the interdisciplinary research and evaluation of physical and social processes of those natural phenomena, of hydro – meteorological and climate nature, which are associated to disasters in Mexico, in order to improve the knowledge of their causes and impacts;
2. Encouraging the collaboration of the REDESClim's network with academic, governmental, private and social institutions, as well as other interdisciplinary networks that work in the fields of research, prevention and mitigation of disaster and urban development, both at national and international level;
3. Strengthening the continuous monitoring of hydro – meteorological and climate events.
4. Improving the forecast and modelling of natural risks associated to disasters
5. Promoting de development of human capacity through courses, workshops and researches;

Proposing prevention and mitigation strategies to cope with disasters, especially focusing on those that have strategic importance for Mexico (hurricanes, floods, droughts, fires and frosts).

The **Research Programme for Climate Change**, at the **National Autonomous University of Mexico**, is aimed at establishing, in an integrated manner, the research agenda on climate change for Mexico. The Programme, created within the Autonomous National University of Mexico, is committed to create adequate space to build own scientific knowledge on the subject and to enhance the promotion of multidisciplinary analysis and

multi-institutional potential opportunities and challenges for development that climate change involves. The programme is structured in three working groups, similarly to the IPCC: the scientific basis; impacts, vulnerability and adaptation, mitigation and policy. The work of the three groups will cross and seek a comprehensive approach. Its general objective are involving, integrating and coordinating the research efforts of the scientific community on climate change; generating the necessary knowledge about different aspects of climate change, its causes and effects; contributing to decision-making and public policy to reduce risk and vulnerability to climate change, increase resilience to climate change and mitigating GHG emissions; joining highly qualified cadres to deal with different aspects of climate change with a multidisciplinary approach and disseminating the results of studies to contribute to awareness of Mexican society on the implications of climate change

The **West Indies Disaster Risk Reduction Centre** is a multi-disciplinary Centre of Excellence in the field of Disaster Risk Reduction and Disaster Management in the Caribbean and globally, especially in Small Island States. The Disaster Risk Reduction Centre emerged out of an initiative to mobilize the West Indies University's expertise to assist Caribbean countries devastated by hurricanes during 2004 and was initially funded by the UNDP, with matching funds from Caribbean governments. The focus of the Disaster Risk Reduction Centre is both preventive—in the provision of technical, advisory and consultancy services to mitigate the risks of disasters—and palliative, in the rapid mobilization of human resource capacity within the University, for in situ assistance and project implementation both before and after disasters. One of the main objectives of the Centre is to develop and implement training, research, advisory and outreach services to enhance disaster mitigation and management in the Caribbean region.

The **Caribbean Disaster Emergency Management Agency** is the regional disaster management body formerly known as CDERA, the Caribbean Disaster Emergency Response Agency. With more than US$5 billion in losses to the Caribbean in the last two decades of the 20th Century, the Agency has refocused its attention on Comprehensive Disaster Management (CDM) which is a new thrust in disaster management for the 21st Century. It focuses on all cycles of a hazard, involving all sectors of the society, and concentrating on all hazards. This strategy has been endorsed by all member states and accepted by the Association of Caribbean States (ACS) which will see it being promoted in the Latin American states of the ACS. At the crux of CDM is a well informed and aware public and activities to achieve full compliance with CDM are at the heart of the CDEA operation. This operation includes: i) Training for Disaster Management Personnel; ii) Development of model training courses and products including audiovisual aids; iii) Institutional Strengthening for Disaster Management Organizations; iv) Development of model Disaster Legislation for adaptation and adoption by Participating States; v) Development of model policies and guidelines for use in emergencies; vi) Contingency Planning; vii) Resource mobilization for strengthening disaster management programmes in Participating States; viii) Improving Emergency Telecommunications and Warning Systems; ix) Development of Disaster Information and Communication Systems; and x) Education and Public Awareness;

CDEMA acts in all the different phases of Disaster Risk Management, mobilizing and coordinating disaster relief; mitigating or eliminating, as far as practicable, the immediate consequences of disasters in Participating States; securing, coordinating and providing to interested inter-governmental and nongovernmental organisations reliable and comprehensive information on disasters affecting any Participating State; encouraging the adoption of disaster loss reduction and mitigation policies, practices at the national and regional level, cooperative arrangements and mechanisms to facilitate the development of a culture of disaster loss reduction; and coordinating the establishment, enhancement and maintenance of adequate emergency disaster response capabilities among the Participating States.

The **Programa de Fortalecimiento de Capacidades para Gestión de Riesgos en Centroamérica (Programme for the strengthening of Risk Management Capacities in**

Central America) is a mechanism of technical cooperation that connects various organizations working on risk management, both at national and regional level. Among such organizations are NGO's, Universities and churches, that historically have been working on different aspects of humanitarian assistance and sustainable development, playing an important role in coping with disasters in central America and the Caribbean. PFC GR's mission is to contribute to the strengthen the impact, organization and development of the information technologies of the networks/forum associated, working on sustainable development with a focus on risk management at national and regional level. The programme is also engaged in the production of strategic thinking and cooperation south-south and north – south, with the aim of constructing a region (Central America and Caribbean) with enhanced resilience to disasters. In this sense, much attention is given to education, organizing specializes courses and diplomas.

Columbia University, Centre for Hazards and Risk Research (CHRR). Columbia University's physical and social scientists are undertaking a new research program in disasters and risk management motivated by a clear and compelling need to reduce the catastrophic impacts on society from natural and human-induced hazards. The Centre for Hazards and Risk Research (CHRR) draws on Columbia's acknowledged expertise in Earth and environmental sciences, engineering, social sciences, public policy, public health and business. It has a twofold focus: the advancement of predictive capability for hazard and risk and the integration of core science with techniques for hazard assessment and risk management. This program infuses the scientific and technological perspective on disasters with a deep appreciation of the social, political, and economic realities of the developing, as well as the developed, world. It requires a renewed focus on translating the key scientific concepts of probability and uncertainty into a language and set of rules useful to decision-makers. The Centre pursues several key objectives that lie at the intersection of hazards and risk research, such as understanding the predictability of natural and anthropogenic hazards, their direct and indirect impacts, and their deterministic and probabilistic interactions; understanding the social, political and economic context of risk analysis, risk awareness, and risk management, with an international scope; developing quantitative methodologies for aggregating risks from multiple hazards and for estimating direct and indirect losses; developing predictive capability for scenario and impact modelling; evaluating and communicating error and uncertainty at all levels of analysis; developing the knowledge and information systems necessary for community building and community interactions, in order to build resiliency at all levels.

Redes de Gestión de Riesgos y Adaptación al Cambio Climático (Networks for the management of risk and adaptation to climate change) is an initiative aimed at providing information on disasters and impacts of Climate Change, exchanging experiences and lessons learnt, analysing risks and strategies for their mitigation, proposing technologies and methodologies to contribute at enhancing capacities for risk reduction and adaptation to climate change. Very much attention is given at the local level, focussing both on local authorities and communities. Specific objectives of the network are reducing the vulnerability of poor people to disasters securing the exercise of their economic and social rights, helping people recovering from disasters, developing a civil protection system integrating local participation and communities, including children, women and natives in risk reduction and emergency policies. The network takes part in various networks and projects on scientific and technologic coordination for local development, environmental education, risk management, climate change and conflict resolution.

Founded in 1994, **Infinita Consulting** is a Mexican SME specialized in the support of big investment projects. It offers services for the creation and management of investment projects like infrastructures and civil works. It is also involved in the development of new products and services as facilities, machinery, software, among others. Infinita Consulting works with public and private subjects, both at national and international level. Of particular interest is the work the firm carries on in the area of water related adaptation and risk.

6.3 Early insights form the stakeholder consultation

What capacity development activities related to NH/DRR/CCA are offered by the CTTMs and for what purpose?

Activities and scope of actions differ from one member to another, due to their different size, nature (IO, NGOs, Academia, SME) and impact at national or regional level. Bodies like the Caribbean Disaster Emergency Management Agency (CDEMA) have a regional scope and cover the whole disaster risk management cycle, focusing on both pre and post disaster phases. Undertaken operations include mitigation, preparedness, response and relief activities. Other organizations, while having a regional perspective, result more committed to specific aspects and specific sides of NH/DRR/CCA. This is mainly the case for Universities, NGOs and SMEs. An interesting example, in this sense, is provided by Infinita Consulting, which mainly operates in the Water Management sector. Focusing on change management for very large complex organizations or projects, the firms carries out a high number of training events, workshops and demos that in 2011 reached around 5 thousand people working with water management. In order to promote a profound institutional transformation in the field, planned activities for 2012 will include a large seminar, teleconferences and workshops for an audience of almost 3000 people.

The majority of organizations or networks contacted offers training activities for their target recipients, that are chiefly communities and local authorities. Some of them have also developed or are developing specific courses in Disaster Risk Management, targeted at different educational levels (DDRC and PFC). For instance, PFC launched a graduate programme in “Climate Change and sustainable living”, with the ultimate objective of promoting strategies for a sustainable living as a way to reduce vulnerability and enhance communities’ adaptation to the effects of climate change.

Another interesting experience in the field of education has been submitted by UNU- EHS, that brought to our attention “WASCAL” (West African Science Service Center on Climate Change and Adapted Land Use), a project aimed at strengthening the research infrastructure and capacity in the region through the creation –among other activities- of seven graduate school promoting education in the field of climate change and land management. Despite targeting another sub-region, i.e. West Africa, the project has been presented as a good example which could also be replicated in other regions such as Central America and the Caribbean.

A common activity undertaken by CTTMs concerns the development and sharing of practical experiences and knowledge: this is mainly done through the organization of workshops or through networking activities both at national and international level. Knowledge sharing and transfer is also promoted through specific and more structured projects. An example is provided by the project “Enhancing resilience to reduce vulnerability in the Caribbean”, jointly carried out by Cima and the Caribbean Institute for Meteorology and Hydrology, with the collaboration of other partnering regional organizations, including CDEMA. Thought to share the know-how and the good practices developed in Italy in the field of Disaster Risk Management, this 3-years project aims at strengthening civil protection mechanisms through capacity development for early warning systems, information dissemination, and institutional coordination for disaster management and response in CARICOM member states. This will be achieved through the implementation of a sustainable network of real-time decision support centres to facilitate early warning and post disaster recovery, established and fully integrated into national and regional planning, the strengthening of national disaster mechanisms to incorporate best practices in volunteerism, the enhancement of institutional capacities and the support to tsunami public education programmes.

A fundamental feature of CTTMs’ activities is the attention to the local level: many projects are addressed to local authorities, communities and particularly vulnerable sectors of civil

societies, like women, children, farmers and natives.

What capacity enhancement content will CATALYST provide to the CTTMs, thus how could they benefit from the project? What would they like to learn from the project, in order to pass it on when conducting capacity building activities on their own right?

In general terms, the contents provided by CATALYST are seen useful to supplement the material used by the organizations and networks contacted for their planned and future workshops and training activities. Some of them have been conducting capacity enhancement activities for many years and the contents provided by CATALYST can make them improve their skills or fill some knowledge gaps. Other organizations contacted have only recently started to promote such activities: in these cases, the contribution given by the project would be very important and have a greater added value.

Very big stress is given by CTTMS to the importance of sharing experiences, best practices and lessons learned from other organizations and regions, in order to better define own capacity building activities. Also the access to databases and on-line resources is valued favourably, as it will permit the development of the participants' skills in the medium-term after the conclusion of the planned workshops.

In terms of specific expectations and needs from the contacted CTTMs, a preeminent emphasis is given to development of accessible databases and the availability of information on regional and local experiences, the definition and sharing of methodological and conceptual frameworks, as well as opportunities of networking and enhancing contacts with other regional organization working on capacity development for disaster risk reduction. The need of developing a more multidimensional and interdisciplinary approach on the different aspects related to natural hazards is also stressed.

Which topics (e.g. risk assessments, measures, proof of benefits, best practices, etc.) are relevant for the CTTMs? How do the themes envisaged in the DoW fit into CTTMs' activities and what focus should be given the highest priority in order to complement best the activities and capacity needs envisaged by the CTTMs?

During the interviews we asked the CTTMs which of the following topics could improve the delivery mechanism or content of capacity enhancement activities conducted by their organizations or networks:

1. Hazard risks assessment, (social, economic) vulnerability and resilience, including the anthropogenic climate risk;
2. Disaster risk reduction measures and policies (at different levels - international, regional, national), including the institutional processes needed to deploy them successfully;
3. Comprehensive assessment of the benefits and 'disbenefits' of disaster risk reduction policies and measures, including their social acceptance, economic effectiveness, costs/benefits, uncertainty;
4. Role of scientific knowledge in disaster risk reduction: evidence-based policy making, evidence-based risk management, role of experts and/or scientific panels and advisory boards;
5. Hazard risks assessment, (social, economic) vulnerability and resilience, including the anthropogenic climate risk;
6. Design and assessment of training and capacity enhancement activities.

All the mentioned topics have been considered relevant by our stakeholders. In particular, point 1 and 6 (Hazard risks assessment, vulnerability and resilience, including the anthropogenic climate risk and Design and assessment of training and capacity

enhancement activities) are thought to be very important when declined at the local level. Adopting a multidimensional and interdisciplinary approach is also seen as crucial, for these activities to be effective.

The role of scientific knowledge in disaster risk redaction (point 4) is also stressed, as a fundamental tool to help policy-makers and practitioners to make better-informed decisions on the short-term. REDESClim also pointed out that it should also be created a new transdisciplinary science where scientists, decision-makers and practitioners participate in the definition of the problems and their solution on middle –term.

Finally, the implementation of disaster risk reduction measures and policies, together with the institutional processes needed to deploy them (point 2), is also seen to be crucial for the region. In particular, a more comprehensive incident command system and awareness programs for disaster preparedness are perceived as needed.

> *What are key vulnerabilities, gaps, missed opportunities, and major (implementation) barriers for DRR and CCA in Central America and the Caribbean and what are existing potentials to build upon in the future?*

The key vulnerabilities of the CAC region seems to be poverty, unemployment, critical management of natural resources and, more in general, the economic development patterns of the region which push large proportions of national populations to live in urban contexts. Spatial expansion of cities in hazard prone areas increases the vulnerability of the urban poor, that are already among the most vulnerable in a city due to limited or unstable income base, poor quality and overcrowded housing, poor quality, inadequate or lack of urban services, inadequate access to social infrastructure such as schools, hospitals, daycare, public transportation and limited or no safety nets, such as availability of food and other basic needs, when income falls or during any crisis.

In this sense, major opportunities would come from a more community based approach to DRR, aimed at reducing the socially constructed vulnerability of poor by involving communities as active participants in a disaster program. Focusing on the local level is seen as a great chance but, at the same time, the lack of such a perspective by the national governments is considered to be the strongest barrier. This situation seems to be exacerbated by the constant scarcity of resources faced by local authorities, which are then brought to focus on the certain and immediate: as a result very few appear to be concerned about risk, or worst, recovery.

Nevertheless, some positive improvements have been registered in the region. For instance, in Mexico the Senate approved a new law to address Climate Change that includes the mandate to set up a risk management strategy at the national and local levels. Even though awareness is increasing, it is a widespread perception that it needs to be backed by more comprehensive knowledge and capacity with respect to DRR.

7 EUROPEAN MEDITERRANEAN

7.1 Key vulnerabilities of the region

Natural climatic hazards in Europe are diverse and frequently occurring and during each time of the year. Storms in Europe remind us regularly that billion-euro loss events are a continuing threat to Europe, as are widespread floods. The ones in Britain in 2007, along the lower Danube in 2006, in the Alps in 2005, and in central Europe in 2002 all set new loss records in the regions where they occurred. But there are also less spectacular catastrophes such as the extreme heat wave in Europe in 2003 (70,000 deaths and over USD 10 billion damage). Natural hazards related to climate change may alter water exchange between ocean basins, the likely result being increased coastal erosion. Natural climatic hazards may also result in elevated sea levels and seawater intrusion into estuaries and groundwater bodies that will affect ecosystems and likely lead to adverse economic consequences. In Southern Europe, the Mediterranean area consists of twenty-one states that have a coastline on the Mediterranean Sea. Climatic related hazards, especially drought, can deplete groundwater resources that are already overexploited in several locations while the increase in water needs is set to remain quite strong as a result of demographic growth in the South and East, development of irrigated areas, industry and tourism. The Mediterranean countries' water demand, having doubled within the second half of the twentieth century, is expected to increase by about 50 km3 by 2025 to reach some 330 km3 /year, a level hardly compatible with the renewable resources and confounded by the impacts of climate change. Climate models reveal temperature rises and a decrease in average rainfall in the range of 4 to 27%, with a particularly marked decline in the summer. Several recent studies have pointed out an increase of droughts in Europe. Under different scenarios presented in several climate change models, drought episodes will intensify in most of Western Europe. Current approach to drought risk analysis and management are characterised by limits in the capacity to understand and assess the complexity drought impacts and their underlying environmental, economic, social and institutional causes. Drought effects are largely non-structural and spatially extensive

The Mediterranean region is subject to hydrometeorological or climatological hazards: According to the NatCatSERVICE, of the disasters due to natural hazards that occurred in Europe since 1980, about 90 % of the events and 80 % of the economic losses were caused by storms, extreme temperature events, forest fires, water scarcity and droughts as well as floods.

These last, in particular, remain the most common natural disaster in the area. In the period 1990-2010, floods accounted for 35% of all natural disasters that hit the Mediterranean region.

The Southern and Eastern Mediterranean countries recorded the highest number of deaths with 3,820 victims mostly due to sudden flash floods striking intensely populated urban areas built in flood prone zones, while the northern Mediterranean countries - Italy, France, Spain, Greece, Slovenia and Albania - registered the highest economic impacts with 21,400 billion euro losses mostly due to flash floods striking tourist coastal towns built without adequate protection or due to river floods inundating plains whose land use was shifted from forest, woodland or agriculture to commerce and industry.

Risk reduction policies exist in many European countries, aiming at numerous hazards (e.g. forest fires, floods, earthquakes). However, these policies across Europe have not yet been harmonized or the process has only started recently. Concerted and coordinated actions at the European level can bring a considerable added value and are likely to strengthen protection of population, infrastructure and ecosystems throughout Europe.

7.2 Core Think Tank Members of the European-Mediterranean region

Table 12: Core Think Tank members of European-Mediterranean region. * MoU not yet received

	Acronym	Full name	country	Networks	Contact person	Type
Europe	CIHEAM*	Mediterranean Agronomic Institute	ES	Multiple/research	Maite Aguinaco	A
Europe	UCM	Universidad Complutense de Madrid	ES	research	Elena Lopez-Gunn	A
Europe	KINGs	King's College	GB	research	Mark Mulligan	A
Europe	IGRAC	International groundwater resources assessment centre	NL	research	Frank van de Weert	A
Europe	PORT	University of Portsmouth	GB	research	Richard Teeuw	A
Europe	CSC	Climate Services Centre	D	research	Maria Manez	A
Europe	IDRAN	IDRAN Engineering & Technology	I	Research	Fernando Nardi	SME
Europe	GLEMDEV	Glemminge Development Research	S	research	Ian Christoplos	SME
Europe	DKKV	German Committee for Disaster Reduction	D	Research/multiple	Karl-Otto Zentel	NGO
Europe	CIHEAM	Mediterranean Agronomic Institute, Italy	I	Research	Nicola Lamaddalena	A
Europe	WUR-DSG	Wageningen University – Disaster Studies Group	NL	Reseach	Jeroen Warner	A

The **Mediterranean Agronomic Institute of Chania (MAICh)** is a constituent Institute of the International Centre of Advanced Mediterranean Agronomic Studies (CIHEAM), which aims to promote international co-operation by providing post-graduate education at MSc level and to develop scientific cooperation between the Mediterranean, Balkan and other regions in the sectors of economics, rural development management and applied biological, technological and environmental sciences. MAICh aims (a) to assist the E.U. and Greek foreign policy, (b) to offer post-graduate education and research activities, (c) to coordinate research networks, which address spearhead topics in European and/or Mediterranean countries, (d) to contribute vigorously to the implementation of research policy in the Community strongly participating to pan-European joint ventures in competitive actions of the DGI, DGVI, DGXI, DGXII, DGXXIII, (e) to join in the implementation of national research policy with participation in the activities inaugurated through the Community Support Framework, by the Ministry for Development, the General Secretariat for Research and Technology, as well as in application development actions carried out by the Ministries of National Economy (INTERREG), Agriculture, and Environment (LIFE), and the Regional Authority of Crete, and (f) to contribute to regional and local development through innovative actions within Regional development programmes. With regards to capacity building, MAICh was involved in such actions through participation/coordination of EU-funded projects.

The **Universidad Complutense de Madrid (UCM)** is one of the largest Universities in Spain and all around Europe. Currently, over 500 different research projects are being funded by different public Spanish agencies; more than 100 by the European Union and 300 by private companies. The UCM and the Faculties and staff involved in this project have been involved in a large number of EU Project grants. The most recent the NEWATER EU project on Adaptive Water management. The faculties of Geology and Economics at UCM provide relevant expertise within DRR on interdisciplinary analysis of adaptation that merges social and natural sciences.

The **King's College** and its **Integrated Research on Disaster Risk (IRDR)** is one of England's oldest and most prestigious university institutions. The Environmental Monitoring and Modelling (EMM) Research Group within the Department of Geography works to deepen the understanding of Earth's hydrological, geomorphological, biophysical, atmospheric and ecological processes and their interactions. The Disasters, Adaptation & Development programme takes a social development perspective and includes human vulnerability and response to natural and technological hazards and to climate change. This program focuses

on a better understanding of the social production of vulnerability to environmental change and hazard, and in partnering with practitioner organizations in promoting proactive and egalitarian international risk reduction agendas. Areas of focus to explore experiences of risk and its management has been Guyana, Barbados, the Dominican Republic, Mexico, Russia and Haiti. The institute focuses on London as well and in particular vulnerability to and adaptation in the management of heat wave and drought risk. The EMM group at KCL has worked extensively in the bridging of science and policy for better understanding impacts of climate and land use change. This has occurred at various scales from the local to the global and with specific focus on the Mediterranean and in Latin America. In addition to a series of EU funded projects on land degradation (EFEDA, MEDALUS, MODULUS, MedAction, DESURVEY) they have carried out policy support focused projects for DfID (impacts of climate change on pantropical hydrology) and for the CGIAR Challenge Programme on Water and Food (CPWF) focusing on climate change impacts in major developing world basins.

The **International Groundwater Resources Assessment Centre (IGRAC)** is dedicated to groundwater information and knowledge in the widest sense, on a world-wide scale and on a non-commercial basis. Their overall objective is to include groundwater fully in the assessment of freshwater resources of the world in order to encourage and enhance the conjunctive and sustainable utilisation of both groundwater and surface water. IGRAC has defined three main fields of activity:

1. The first one is the development of a Global Groundwater Information System (GGIS) for various categories of stakeholders. The System is envisaged as an interactive and transparent portal to groundwater-related information and knowledge.
2. The second field of activity is the development and promotion of guidelines and protocols for the assessment of groundwater resources. It pays special attention to monitoring of time-dependent groundwater data.
3. Finally, IGRAC participates in or contribute to global and regional projects in need of groundwater-related inputs.

Furthermore IGRAC has taken the initiative to prepare an overview of the effects of the tsunami on the groundwater. IGRAC will compose the overview from the knowledge already available at IGRAC and other cooperating agencies and from the information obtained from the local organizations and aid agencies.

The **University of Portsmouth (PORT)** is committed to promoting the discovery, development and application of knowledge through high quality research. The MSc Crisis and Disaster Management is an innovative course, developed by internationally-recognised experts with cross-disciplinary expertise in the School of Earth and Environmental Sciences, and the Department for Strategy and Business Systems at the University of Portsmouth. The School of Earth & Environmental Sciences at the University of Portsmouth is involved in research, consultancy and knowledge transfer activities via its Centre for Applied Geoscience (see: http://www.port.ac.uk/departments/academic/sees/research/centreforappliedgeoscience/). The activities for capacity building in disaster risk reduction can best be summarized by disaster type:

1. Volcanic, seismic, landslides, flooding & tsunami: training for government disaster managers and community leaders in low-coat approaches to hazard, vulnerability and disaster risk assessments (Commonwealth of Dominica, Caribbean); guidelines on communication of disaster risks (various Caribbean volcanic islands); training of government officials and university staff in uses of low-cost remote sensing and GIS for mapping hazardous terrain, vulnerability and zones of disaster risk (British Virgin Islands, Sri Lanka, Kyrgyzstan);
2. Water scarcity & famine risk reduction: community-based water resource strategies, focusing on enhanced groundwater use, rainwater harvesting, community water budgets and monitoring of water resources (Sierra Leone); training for government officers in the use of low-cost remote sensing and GIS for groundwater water

exploration and water resource management (northern Ghana & Mauritania).

The University also has close links with a UK NGO, MapAction, which is primarily involved in disaster crisis response (supplying daily situation maps, e.g. for Search & Rescue teams), but which has recently shifted towards geoinformatic capacity building for disaster risk reduction, an example is a Field Guide for Humanitarian Mapping (see: http://www.mapaction.org/more-news/270-humanitarian-field-guide.html)

The **Climate Services Centre (CSC)** works on political consulting, focused on international climate policy and climate economics, on questions on how can socio-economic systems be strengthened, to face the chances related to climate change. Particular topics are the ability of regeneration (resilience) and adaptation of social structures. Further focus is on climate and security as well as participation approaches. Doing so, the native of Spain works on the question: how will climate change influence the security situation and how can different groups of society be involved in decision-making processes?

Hydraulics Applied Research and Engineering Consulting (HAREC) / Engineering and Technology (IDRAN) is a private civil engineering consulting firm specializing in the research, development and application of technologically advanced solutions for water-related projects. They bring know-how and expertise on hydraulics within projects that involve all aspects of natural hazards, e.g. floods, earthquakes, tsunamis and landslides.

Glemminge Development Research (GLEMDEV) is a small firm based in Southern Sweden. It undertakes research, evaluations and provide consultancy services in connection with development programmes and humanitarian assistance efforts in a range of countries and contexts. Its focus is on empirically informed, politically aware and practically oriented analyses. Its foremost specialization is in awareness of the challenges and opportunities facing our local national partners in dealing with dynamically changing conditions. Particular attention is given to institutional and organizational processes of capacity development. GLEMDEVs intention is to provide advice and programme analyses that help their clients and partners to work more effectively in addressing poverty and risk in their unique environments. The majority of its assignments are in post-disaster, post-conflict and chronic conflict contexts. GLEMDEV have, for example, been actively involved in evaluations of links between relief, rehabilitation and development after the South Asian tsunami. Furthermore GLEMDEV has led evaluations of the work of the Secretariat of the International Strategy for Disaster Reduction and UNDP's disaster reduction programme in Vietnam. This aspect of its work has increasingly focused on the links to climate change adaptation, where GLEMDEV have supported efforts to operationalise the calls being made to link these two agendas. GLEMDEV have been involved in policy analysis related primarily to how to shift attention within the climate change discourse to the human and institutional dimensions of the coming adaptation challenges.

The **German Committee for Disaster Reduction (DKKV)** is the national platform for disaster risk management in Germany. It is intermediaries to international, in the field of disaster reduction initiatives and organizations involved and it's a competence center for all issues of national and international disaster preparedness. DKKV supports interdisciplinary research approaches for disaster risk reduction in other trade sectors, as well as in politics and economy along with the dissemination of knowledge of disaster preparedness at all levels of education.

7.3 Early insights form the stakeholder consultation

What capacity development activities related to NH/DRR/CCA are offered by the CTTMs and for what purpose?

The majority of the CTTMs in the European Mediterranean region consist of universities and

research centres. Thus the majority of capacity development activities are constituted by sharing of knowledge through seminars and programs. Climate Service Centre (CSC) offers e.g. Self-Leadership and Empowerment Seminars (SLE-Seminars) for disaster risk reduction. Another type of knowledge sharing is provided by International Groundwater Resources Assessment Centre (IGRAC). One of their projects that is currently being worked on, is the so-called Global Groundwater Monitoring Network (GGMN). This is going to be a web-accessible regional groundwater level monitoring tool where countries or even experts could upload groundwater data and information such that it becomes more widely available. They believe that the GGMN might be complementary to other drought forecasting and monitoring tools. They plan an initial workshop and pilot project with UNESCO-IHP in East Africa to test it. Invitees will be UNESCO-people and governmental staff of groundwater-related departments and geological surveys. However the list of CTTMs also includes SMEs and a single NGO represented by German Committee for Disaster Reduction (DKKV). DKKV is working to ensure that policy-makers, industries and administrations translate the finding of research into disaster practical measures. It aims to transcend the boundaries between scientific disciplines and countries and utilize the benefits of integrated disaster risk management.

What capacity enhancement content will CATALYST provide to the CTTMs, thus how could they benefit from the project? What would they like to learn from the project, in order to pass it on when conducting capacity building activities on their own right?

In questionnaires received from the CTTMs it is stressed that good quality scientific information is very important and that as it is today, knowledge about who is producing what kind of information is not very accessible. Furthermore it's mentioned that the lack of translation of information in the EU is problematic. Thus a lot of information is available in English but less in e.g. German and Spanish. IGRAC emphasizes that scientific information always should be accompanied by capacity building that lead to attitude changes towards how to solve issues like e.g. droughts. Furthermore IGRAC suggest that groundwater resource management as part of Integrated Water Resource Management (IWRM)/adaptive management is an important topic. In regards to what form of capacity enhancement that would be most useful for the organizations in this region, both best practices and available knowledge was mentioned.

Which topics (e.g. risk assessment, measures, proof of benefits, best practice etc.) are relevant for the CTTMs? How do the themes envisaged in the DoW fit into CTTMs' activities and what focus should be given the highest priority in order to complete best the activities and capacity needs envisaged by the CTTMs?

The CTTMs were asked which of the following topics could improve the delivery mechanism or content of capacity enhancement activities conducted by their organizations or networks:

1. Hazard risks assessment, (social, economic) vulnerability and resilience, including the anthropogenic climate risk;
2. Disaster risk reduction measures and policies (at different levels - international, regional, national), including the institutional processes needed to deploy them successfully;
3. Comprehensive assessment of the benefits and 'disbenefits' of disaster risk reduction policies and measures, including their social acceptance, economic effectiveness, costs/benefits, uncertainty;
4. Role of scientific knowledge in disaster risk reduction: evidence-based policy making, evidence-based risk management, role of experts and/or scientific panels and advisory boards;
5. Design and assessment of training and capacity enhancement activities.

Topic 1-4 were attached most importance in the European Mediterranean region.

What are key vulnerabilities, gaps, missed opportunities, and major (implementation) barriers for DRR and CCA in the European Mediterranean region and what are existing potentials to build upon in the future?

Key vulnerabilities are high frequency of droughts, flash floods, heavy rain and heat waves. Capacity gaps and perceived barriers include:

1. Limited expertise to engage the public in governmental programs
2. Poor cooperating departments, non-existing bridge of information between science and policy and also between stakeholders and policies
3. Grass-root and/or traditional knowledge initiative often do not meet the top-down governmental (donor sponsored) programs
4. Limited technical capacity to deal with issues, limited monitoring and forecasting of DRR like drought forecasting, limited institutional capacity to deal with issues
5. Current political atmosphere in many of the eastern and southern Mediterranean countries is not very favourable for any water management capacity building at all
6. Bias towards finding surface water solutions (including desalinization) instead of groundwater-based solutions.

In regard to existing initiatives on climate adaptation Climate Service Centre (CSC) consider these as being totally insufficient. They state that the few that exists are private- or NGO driven.

8 ANNEXES

8.1 Annex 1: Events, meetings and conferences related to NH/DRR in the Catalyst sub-regions. September – December 2012

In order to provide a major echo to CATALYSTS' activities and exploit fruitful synergies with events already organized in the targeted sub regions, the venue of CATALYST's physical workshop will be identified taking into account scheduled Meetings and Conferences taking place in the last trimester of 2012. A preliminary list of planned events on the topic of NH/DRR follows (Source: PreventionWeb).

European Mediterranean

4th International disaster and risk conference IDRC Davos 2012 Global Risk Forum
Date: 26 Aug 2012 - 30 Aug 2012
Location: Switzerland (Davos)

Over 1000 participants will gather from more than 100 countries for the world's leading Disaster and Risk Conference in the mountain area and renovated conference centre of Davos, Switzerland.

Business leaders, political decision makers, practitioners, scientists and UN, International Organizations, and NGOs will discuss new findings and exchange experiences in the broad spectrum of risks societies are facing today.

IDRC Davos 2012 "Integrative Risk Management in a Changing World" offers ample opportunities for networking, experience exchange, and information gathering with exhibition booths, donor and sponsor events- a project fair- meeting rooms, a job fair, specific services and side events and much more.

West and East Africa

Southern Africa Society for Disaster Reduction 1st biennial conference
Date: 10 Oct 2012 - 12 Oct 2012
Location: South Africa (Potchefstroom)

The Conference welcomes disaster reduction academics, researchers, practitioners and postgraduate students from around the globe. The aim of the conference is three fold:

1. The ACDS will be turning 10 years in 2012 and this 1st International Conference on Disaster Risk Reduction will be held to celebrate the 10 years.
2. Secondly, the aim of the conference is to provide a platform for the presentation, discussion and debate of different academics and professional approaches and research on disaster reduction issues.
3. Thirdly, the ACDS plan to establish and launch a disaster risk reduction society for the Southern Africa (SADC region) during the conference. The aim of the society is to bring together practitioners/NGOs in the various fields of DRR and the academic/research domain and to provide a platform to share knowledge and good practices, engage in mentorships and internships, influence policy and advocacy in the SADC region.

Central America and the Caribbean

Caribbean Conference on Comprehensive Disaster Management
Date: Dec 2012 (to be defined)
Location: to be defined

The Caribbean Conference on Comprehensive Disaster Management organized by CDEMA had its inception in 2006 when the first conference was hosted in Barbados, building on the

Caribbean Natural Hazards Conference. It attracted over 200 participants and 20 exhibitors. It is structured to promote good practice, share ongoing research and chart a way forward for advancing CDM in the Caribbean. It provides a platform for networking among disaster management practitioners, donors, NGOs, public and private sector organisations, researchers, civil society and other stakeholders. It also provides an opportunity for reflection and dialogue and helps to measure progress in advancing the CDM Agenda within the context of the Enhanced CDM Strategy and Programming Framework 2007-2012.

The conference facilitates exchanges on CDM related research, tools, models, products information and educational material and provides the opportunity for obtaining commitment for, and promotion of, the goals of CDM.

South and South – East Asia

Fourth United Cities and Local Governments Asia-Pacific - UCLG ASPAC regional congress
Date: 02-05 Oct 2012
Location: Indonesia (Jakarta)

The 4th Congress is the continuation of the 1st Congress in Daegu City, South Korea, the 2nd Congress in Pattaya, Thailand, and the 3rd Congress in Hamamatsu, Japan. The aim is to exchange views, ideas and information which will aid UCLG members in the Asia-Pacific region to conceive, build and create a network of resilient cities with the strenght to respond to the challenge of globalization.

The main theme: Resilient cities – Rethink, Rebuild, Revitalize.

5th Asian ministerial conference on disaster risk reduction (5th AMCDRR)
Date: 05-08 Nov 2012
Location: Indonesia (Yogyakarta)

Building on past agreements and issues discussed in the earlier conferences, particularly in the 3rd and 4th AMCDRR, the 3rd Session of Global Platform for Disaster Risk Reduction, as well as Indonesia's own experiences that reaffirms the importance of enhancing DRR implementation at local level as part of the strategic venue to build nations and communities to disasters, Indonesia proposes the following sub-themes for the forthcoming 5th AMCDRR:

1. Integrating Local Level Disaster Risk Reduction and Climate Change Adaptation into National Development Planning
2. Local Risk Assessment and Financing
3. Strengthening Local Risk Governance and Partnership

Source: http://www.preventionweb.net/english/professional/trainings-events/events/

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