



Climate Change and Security

Three Scenarios for Middle America

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This report does not reflect the opinion of the European Commission

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Executive Summary

Climate change poses two key challenges for Middle America: First, the gradual impacts of climate change alter the landscapes of the region. This includes among others the melting of the Andean glacier and the degradation of the Amazon rainforests; both will change productive patterns and socio-economic structures. Second, climate-variability will increase, which will manifest via more unpredictable weather patterns and potentially more extreme weather events such as hurricanes and droughts. Current patterns of unsustainable natural resources management could accelerate these processes further on a regional level. While many regions are vulnerable, particular **hot spots will be the Andean and Amazon regions, and Central America**. The main direct impacts of climate change will be on issues related to human development: **Access to food, water, shelter and energy will be especially negatively affected.**

However, **social and economic disparities** are significant across Central and South America. Migration across countries and continents, among others to USA and Europe, are common strategies for coping with limited economic opportunities at home. **Disputes over resource access**, land and wealth-sharing persist. Many Latin American countries have also faced **political instability** in the past years. **Violent conflict** continues in Colombia, but international tensions between Colombia and its neighbours – particularly Venezuela – have increased markedly in 2008/2009. Secession movements surfaced in Bolivia via illegal referenda. Narcotics-related **organised crime** and violence are key challenges in many countries, among others Mexico.

Climate change will potentially aggravate these situations by further highlighting resource-use-conflicts. Socio-economic disparities are likely to become exacerbated. In the worst case, the capacities of governments may not suffice to cope with these issues and with real or perceived inequitable distribution of costs and impacts of



Middle America

climate change could fuel secessionist movements. State capacities may diminish due to escalating costs of adaptation and recovery, with state security forces becoming tied up in disaster response operations. Organised criminal organisations could seize this opportunity and widen their influence, accelerating state fragility.

The extent of impact depends largely on advanced planning and early action for adaptation. Awareness for linkages between climate change and security issues is increasing, with particular focus on human security and disasters. Formulating responses and advanced planning and adaptation will require **improved analysis and information** on the concrete local and (sub-)national impacts of climate change. Developing **scenarios could serve as an important awareness raising and dialogue tool**. **National and regional level cooperation and coordination** on actions need to be improved. Finally, **conflict-sensitivity** will be of key importance in implementing projects due to the unstable and fragile situations. The EU can play an important role here as **facilitator and enabler**.

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List of Abbreviations

AR4	IPCC 4th Assessment Report
CCIS	Climate Change and International Security
EC	European Commission
ENSO	El Niño Southern Oscillation
EU	European Union
G20	Group of 20
GAERC	EU General Affairs and External Relations Council
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel on Climate Change
LAC	Latin America and the Caribbean
SEC	Council Secretariat
SLR	Sea-level rise
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNSC	United Nations Security Council

1. Introduction

Climate change is likely to be among the key challenges for international security and stability in the 21st century (EU 2008). The European Union (EU) initiated the EU Process on Climate Change and International Security (CCIS) in response to climate threats. The process commenced with the Joint Paper by High-Representative Solana and Commissioner Ferrero-Waldner in March 2008 (EU 2008a). A progress report was submitted by the European Commission (EC) and the Council Secretariat (SEC) to the General Affairs and External Relations Council (GAERC) in December 2009. Additionally, the United Nations (UN)

As part of EU process, a synopsis of findings of regional studies on climate change and security was produced (Maas/Tänzler 2009). Within the scope of the study, four regions were identified, which have been less researched so far. Based on the synopsis, four additional studies were commissioned by the EC. The purpose of the studies is (1) to provide an overview to the region and likely climate change impacts; (2) outline potential security implications of climate change; and (3) to develop recommendations for the EU's foreign, security and development policy.

The regions are Middle America, South East Asia, South West Asia and the Indian-Pacific Ocean Island States' region. **This study focuses on Middle America**, which is defined as stretching from Mexico's northern border to the Amazon basin.

The study focus on the region as a whole; individual countries and sub-national regions will be examined where appropriate. A common structure was defined for all regional studies. It is as follows:

- **Section 1** provides an executive summary on major findings and recommendations.
- **Section 2** provides a regional overview to the region. It will briefly discuss issues of demography and migration, key economic challenges, as well as outline main lines of political and social instability and conflicts in the region.
- **Section 3** summarises the key impacts of climate change on the region.
- **Section 4** outlines potential conflict constellations and scenarios, how climate change may lead to

insecurity and instability. These constellations are plausible, yet hypothetical and are based on literature review and expert assessment; more research is needed to improve validity.

- **Section 5** outlines how different stakeholders have already begun to cope with the challenges of climate change for security. The section concludes with recommendations to the EU.

Security is broadly defined in this study. Climate change is best viewed as a threat multiplier, which may create or exacerbate insecurities and tensions from the individual to the international level (EU 2008a). There are a variety of studies categorising and analysing the different channels, pathways and linkages between climate change and insecurity.¹ A key difficulty is the use of the term 'security': Depending on its context and use, it may denote 'hard' (political/military conflicts) or 'soft' (access to food and water) issues. Climate change may impact 'hard' and 'soft' dimensions of security. Also, impacts on one dimension, such as food insecurity, may also have impacts on the other dimension, such as via food riots (cf. Carius et al. 2008). Thus, 'security' is broadly defined within the scope of the studies below. In particular, we will focus on the following aspects:

- **Contributing to violent conflict and disputes** from the local to the international level.
- **Leading to state fragility**, radicalisation and degrading state capacities to implement policies.
- **Degrading human security and livelihoods** via increased risks of disasters, food insecurity, energy poverty and the like.

Regarding climate change impacts, there is emerging consensus that climate change impacts will be far more drastic than assessed in the 4th Assessment Report (AR4) of the Intergovernmental Panel on Climate Change (IPCC). For instance, sea-level rise (SLR) is likely to be twice as high as estimated by the IPCC (Richardson et al. 2009). Also, limiting global warming to 2°C, as intended by the EU and many other states, is already no longer possible:

¹ For a more in-depth discussion on interlinkages between climate change and different definitions of security, see Carius et al. 2008, WBGU 2007, Brown 2009, Smith/Vivikanda 2009, EU 2008.

It would require emission cuts within the next decade unlikely to be achieved (Fetzek 2009: 2). Instead, global warming of 4°C (with strong regional variations) by end of the century is currently becoming a more likely scenario (Richardson et al. 2009; Allison et al. 2009). However, a strong uncertainty remains when and how concrete impacts of climate change will manifest. Thus, the studies will focus on the general climate trends already observable within the regions. They will span the period from the present day to 2050 as social, economic and environmental trend estimates are comparatively accurate for this time period, compared with 2050-2100 (cf. Lee 2009). **Methodologically, the studies are based on** desk-based research, interviews with experts and technical workshops held in Bangkok (Thailand) on September 3; Suva (Fiji) on September 10; Quito (Ecuador) on

November 4; and Beirut (Lebanon) on November 18. **38 working days have been allocated for each study including research, travel, workshop facilitation and report writing.** Due to regional specificities, the studies slightly vary with regard to their structure and approach.

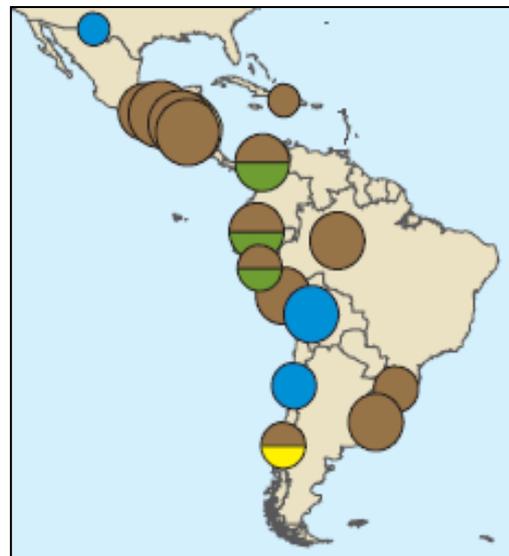
The studies do not aim to be comprehensive. Analysing potential future developments is always speculative to some degree. The scenarios are thus assumptions about likely relationships between climate change trends and the current regional context. Hence, this study provides an overview to key emerging issues related to climate change and security. More research will be needed to identify concrete national and sub-national hot spots and develop tailored recommendations.

2. Politics, Society, Economy and Environment

The region is home to various political and social conflicts. Access to natural resources and land is among the key causes of conflict, with the long-running insurgency in Colombia primarily funded by coca production and trafficking. Several countries have faced instability and violent protests: A **central cleavage** is occurring between indigenous and non-indigenous populations. In addition, violent crime is significant in several countries, resembling a low-intensity armed conflict. Several countries consider **drug-related violence as a major national security threat**. While the region has developed economically better than other regions, huge disparities in benefit-sharing exist, with massive poverty endemic in many Latin American cities.

Political conflict and instability is a fact of contemporary Central and South America. This includes manifest violent conflict in the case of the Colombian insurgency, which is among the most long-running conflicts in the region and continues to this day despite recent decreases in violence (Catarious/Espach 2009). Among the primary sources of the conflict's funding is coca production and trafficking, with Europe being among the key destination areas (Europol 2009). There are even indications that the European trade is intensifying and becoming more organised (Ibid.: 34). The conflict in Colombia escalated to a new level in recent times due to cross-border operations of the Colombian military. Venezuela and Ecuador considered these acts as aggressive and moved their own military forces to their borders. Venezuela did not exclude a military confrontation between both countries (HIIK 2008). Environment and natural resources have in the past contributed to conflict as well (Carius et al. 2007, see also Map 1). Questions regarding

allocation of natural resources, wealth sharing, and indigenous rights fuelled turmoil in several countries such as Bolivia, Colombia and Chile. In the case of Bolivia, several provinces held (illegal) autonomy



Map 1: Incidences of Environmental Conflict. Source: WBGU 2007

Country ²	Population 2010 in millions	Population 2050 in millions	Population below poverty line in percent	Employment in Agriculture in percent	Oil Exports Barrels/day ³
Bolivia	10.031	14.908	60	40	10,950
Brazil	195.423	254.085	31	20	570,100
Colombia	45.3	62.877	49.2	22.4	294,000
El Salvador	6.194	7.882	30.7	19	1,927
Ecuador	13.775	17.988	38.3	8.3	417,000
Guatemala	14.377	27.48	56.2	50	21,850
Honduras	7.616	12.402	50.7	39.2	0
Mexico	110.645	128.964	13.8/40 ⁴	15.1	1,986,000
Nicaragua	5.822	8.143	48	29	212.5
Panama	3.508	5.092	28.6	15	4,803
Peru	29.496	39.049	44.5	0.7	68,640
Venezuela	29.044	42.042	37.9	13	2,182,000

Table 1: Population and Economic Estimates and Data in Selected Countries

referenda in 2008; they turned out to be overwhelmingly in favour of autonomy, but were suppressed by the national government (HIIK 2008). Hiking food prices catalysed violent protests in Peru in 2008, among others. Environmental degradation is among the main structural drivers of continued Haitian instability (cf. ICG 2009). There have also been **disputes between the USA and Mexico over water**-usage in border areas (see also Map 1). The river is critical for farming in the northern parts of Mexico. Crime rates are high throughout the region and violent crime resembles civil wars in some instances: Mexico marshalled the national army to fight drug cartels, while gang violence in several countries such as Brazil or El Salvador is significant (cf. HIIK 2008). Indeed, **narco-violence is considered a national security** issue in Mexico and Central America (Fetzek 2009). The USA has actively engaged with its southern neighbours to curb the drug trade in the so-called “war on drugs” (see also Catarious/Espach 2009).

Demographically, the population of Middle America is young and continues to grow. It is

estimated that the population of Latin America will increase by about 23 percent until 2050, to nearly 730 million (UNPD 2008, see table 1). While the population of all countries continues to grow, the effects of this **growth will be unevenly distributed**: The population density of large countries as Brazil and Venezuela will rise from 23 to 26 and 32 to 46 persons per square kilometre, respectively. Other countries such as El Salvador and Guatemala however, may see increases from 294 to 375 and 132 to 252 persons per square kilometre, putting substantially more pressure on the environment: 50 percent of the labour force in Guatemala is currently employed in the agricultural sector, which also provides 40 percent of its exports (CIA 2009). Many countries are strongly dependent on agriculture for employment and on natural resources for income, particularly fossil fuels (such as Mexico, Venezuela, Colombia, Peru, Ecuador, and Bolivia).

Latin America and the Caribbean (LAC) are among the most urbanised regions in the world: Currently, nearly 80 per cent of the population is living in urban areas, and this figure continues to increase (UNPD 2008). Urban governance faces environmental challenges, poverty and inequity, lacking social services, and health issues. Lack of sanitation and access to potable water in particular are key deficit areas for the urban poor (Winchester/Szalachman 2009). High crime rates are an additional challenge, with organised crime often

² Source: Population estimates from UNPD 2008 (median variant); economic data from CIA 2009.

³ Note that many countries are dependent on re-importing refined oil.

⁴ From CIA 2009: “13.8% using food-based definition of poverty; asset based poverty amounted to more than 40%”

filling gaps left by public authorities (Peetz 2007; Barqueiro 2006).

Cities are often located in coastal areas, making them vulnerable to extreme weather events, particularly in the Gulf of Mexico. Hurricane Katrina provided evidence that even developed countries such as the USA face significant challenges from extreme weather events. In northwest South America, many large cities, such as Quito and Lima, are situated in or close to the Andes. They are **dependent on the Andes glaciers for fresh-water and hydropower** (WBGU 2007, see Map 2).

There are established **migration routes** from LAC, and in particular Mexico and Central America/Caribbean, to the USA. Border controls and visa regimes were tightened after September 11, and in order to curb illegal migration, and this has slowed down the movements. In compensation, increased migration to Europe, particularly to south-western Europe has been observed (IOM 2004).

Mexico, Brazil and Argentina are part of the Group of 20 (G20), signifying the relevance of the region for the global economy. However, while several countries such as Colombia are middle-income countries with comparatively good macroeconomic indicators, **income distribution is highly unequal** (Godnick et al. 2008). Additionally, access to natural resources – land, but also non-renewable resources such as fossil fuels – is politicised and concentrated among elites, which has led to social conflict in the past (Ibid.). The global



Map 2: Cities in the Andean region. Source: UNEP 2009

financial crises also impacted Latin America, and will likely lead to increased unemployment and poverty (ECLAC 2009). This will further exacerbate unequal benefit sharing and economic disparities, which are symptomatic for the region (Ibid.). Marginalised communities include indigenous communities in particular. Recently, several countries such as Venezuela, Bolivia and Ecuador embarked on stronger pro-poor and pro-indigenous policies. If adequately tailored, they can support adaptation measures and thus mitigate potential frictions induced by climate change (see next section) However, such policies were met with resistance in several countries.

3. Climate Change Trends and Impacts

Climate change poses **two key challenges**, specifically for Latin America: First, the gradual impacts of **climate change alter the landscapes** of South America. This includes the **melting of the Andean glacier** and the **degradation of the Amazon region**; both will change the region's productive patterns and socio-economic structures. Second, **climate-variability will increase**, which will manifest via more extreme weather events such as hurricanes and droughts, and more **unpredictable weather patterns**. The latter is particularly worrisome, as climate variability may modify weather patterns in less than a decade, leaving little time for adaptation.

The El Niño Southern Oscillation (ENSO) is of critical importance for weather patterns in the Latin American region due to its impacts on air and sea temperature. Most likely, it will lead to more and more severe droughts from Brazil to Mexico (see Map 3). Generally, reduced precipitation can be expected for Central America, adversely affecting agricultural production in the region (Lee 2009). ENSO as well as

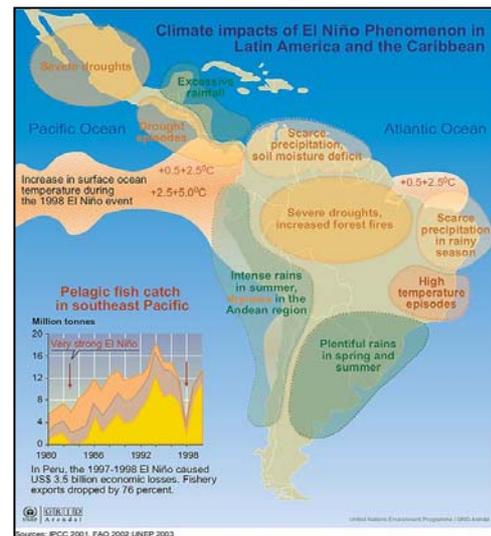
warming of the seas will most likely also lead to shifts in the availability of fish. While long-term gradual shifts are challenging (see below), adaptation could take place with sufficient early identification. More difficult are the short-term impact on **weather patterns, which could change within 4-10 years** (Vergara 2009: 5). Hence, **short-term climate variability and unpredictability are likely to be**

more critical than long-term impacts (cf. Fetzek 2009): Planning and adaptation have to be highly flexible, and resources – such as emergency responses to disasters or post-disaster reconstruction – have to be mobilised at short notice.

A key challenge will be climate-induced degradation and possible **savannisation of the Amazon rain forest**. Climate change will accelerate this process through increased regional warming, reduced river run-off, – particularly the Andes feeding into Amazon rivers – more exacerbated dry seasons, as well as droughts leading to forest fires. Currently, deforestation is taking place at an unsustainable pace, accelerating land degradation (Lee 2009). Due to the declining rain forest less water may evaporate, leading to even less rainfall and further accelerating the processes described above, creating a **feedback loop** (cf. Allison et al. 2009). By mid-century, the Amazon rain forest may be replaced with shrub lands and a savannah-like landscape (cf. IPCC 2007: 583 et seq.).⁵ The result will be a **natural and a social tipping point**: The Amazon rain forest will not longer mitigate climate change by acting as a carbon sink, but instead become a producer of greenhouse gas emissions (GHG), **jeopardizing the global 2°C aim and further accelerating climate change**. Socially, exploitation of natural resources (food, ethanol, timber, etc.) will shift and in some areas cease as the ecosystem drastically changes (Lee 2009). This will have economic repercussions locally – potentially triggering migration – as well as globally, given the role of the Amazon basin in biofuel and food exports

Sea-level rise will also pose a significant challenge: Many **urban centres, economic activity, populations and critical infrastructure are located on or close to the coasts**. Additionally, tourism is a major economic factor in the coastal regions of several countries. SLR is likely to increase coastal erosion, and result in flooding and salt-water intrusion in low-lying lands, thus threatening coastal populations and investments (IPCC 2007). This will be more pronounced in the Gulf region. In addition, for geological reasons the impacts of SLR will be exacerbated in the coastal areas of Ecuador, Brazil, Colombia and Guyana (Miller 2009).

⁵ In case global warming accelerates faster than the IPCC estimated, this could happen even sooner. As the IPCC has been consistent in underestimating the pace of climate change and global warming, this should be considered as quite possible (Richardson et al. 2009).



Map 3: Impacts of ENSO. Source: UNEP 2009a

In 2030, temperatures in Central America may have increased by 1.3-1.8°C, and will **exceed 2°C by 2050**. Together with likely reductions in precipitation, this could lead to a **20 percent reduction in crop yields** (cf. Fetzek 2009). Concurrently, population growth and the attending increase in food demand are not limited to region: As global population is expected to rise and food production to fall this could severely exacerbate international competition for food. However, today already **Mexico needs to import more than 50 percent** of its food (Ibid.; see also Spring 2009).

The adaptive capacities of the region are mixed. While global studies view this region as relatively less vulnerable (Earhart et al. 2008), a large part of the population lives in poverty and has only limited capacities to adapt. Many marginalised communities live in areas vulnerable to natural disasters, such as flash floods or sea-level rise. Furthermore, climate change as a phenomenon and its concrete (sub-) regional impacts are currently not well known in the region. Countries such as Mexico have just started to conduct vulnerability assessments for different regions to develop action plans.⁶ Major research deficits remain, not only regarding impacts, but also on governance issues related to climate change, early warning and advanced planning (cf. Dumas/Kakabadse 2008). Without significant investments in research and information dissemination, it is unlikely that people can make the best use of their resources.

⁶ Interview with governmental official, Mexico City, 24 November 2009.

4. Risk Analysis and Scenarios

Central America, the **Andean region** and the bordering **Amazon basin** are likely **hot spots**. Countries currently facing instability – Bolivia, Peru, Colombia, Ecuador and Venezuela – are among the critical areas threatened, plus Mexico. While **internal pressures** exist and are likely become exacerbated, **external pressures** are also likely to increase in significance in the upcoming years. The range of outcomes is diverse: **Local violence, separatism and instability** are among the potential impacts. Also, **international conflicts** could increase, either between states or when external powers attempt to tap into the Amazon basin, either for exploiting its resources or in attempting to preserve it.

The diversity of Middle America and its socio-economic complexity allow for a diverse range of scenarios. Extrapolating the current regional situation under conditions of climate change leads to the conclusion that the latter is likely to aggravate existing conflicts (cf. Catarious/Espach 2009). Poverty and human insecurity are expected to increase where climate change will negatively affect agricultural production and coastal communities. Further impacts will potentially shift productive landscapes and trigger migration. This includes cocaine production as well, which could impact the geographical patterns of insurgency in Colombia (see Catarious/Espach 2009; Carius et al. 2008).

Repeating shocks, such as extreme weather events in Central America or a series of major droughts in the Andean region (particularly when the glaciers are gone) could lead to humanitarian crises and reversal of development. Given the large amount of rural and urban poor with low adaptive capacities, this would put millions in peril. Indeed, while the region may at first glance appear to be less vulnerable than other regions due to its abundant natural resources, still major environmental changes – Andean glacial melt, Amazon savannisation – coupled with lacking governance in multiple sectors may lead to social tipping points: Release of frustration and grievances in violent fashion once a catalyst emerges.

Below three possible developments are outlined – illustrative scenarios⁷ on the interaction of climate change with the current social, economic and political trajectories of the region – describing how climate change may affect stability and security in Middle America. They are based on the findings above and each begins with a set of “key assumption” about factors that are either already

present today or which will likely be further aggravated in the future by climate change.

The focus of the scenarios is on possible worst case developments, which need to be avoided. Additional scenarios will be necessary to develop to identify policy pathways in preventing climate-induced crisis. The scenarios below could serve as an input to this, but would require expansion.

4.1 Fragmentation

Key Assumptions

- Climate change exacerbates social and economic disparities within societies; adaptation policies are either too late and/or not-conflict sensitive.
- Governance and policies continue to be polarising and divisive; parts of society feel alienated and marginalised and consider central governments as ineffective and illegitimate.
- Groups can tap natural resources for funding and access transnational criminal networks or other sources to purchase arms, thus acquiring means for insurgencies.
- Increased competition over dwindling strategic resources – particularly Andean waters – undermines regional cooperation and stability efforts.

Several federal states in Bolivia held illegal referenda on greater autonomy. In Venezuela, similar intentions are recognisable by constituent states. In Colombia, the Fuerzas Armadas Revolucionarias de Colombia (FARC) long held de facto authority over large territories. In Brazil, the defence community allegedly fears a “Kosovo situation”, where indigenous people could declare independence (see Lee 2009).

⁷ Many studies on climate change and security use a scenario-approach due to the novelty of the issue and its complexity (see Maas/Tänzler 2009). For a further elaboration of this approach, please see WBGU 2007.

Discontent on the sub-national level with central governments is widespread. Climate change may accelerate these trends in multiple ways. First, central governments become even less capable to implement policies or fail to cope with climate change impacts, such as natural disasters or failed adaptation policies. The Andes, suffering from melting glaciers, will face significant challenges from climate change, particularly if several drought events further deteriorate socio-economic and humanitarian situations. Communities become marginalised and experience a severe deterioration of livelihoods, while those already on the brink face even more severe livelihood insecurity. Second, discontent arises when an unfair burden-sharing is perceived: In the case of Bolivia, the more affluent provinces were the ones who wanted to split from the central government in order to avoid a redistribution of their resources. Where governance is polarising or appears to favour only one group, parts of society may feel that they are better off without the central government. Populism and polarisation of societies are already present today. Divisive rhetoric by political leaders could exacerbate the situation when governmental authorities revert to (military) force to curb such secessionist actions.

The cross-border operations of the FARC and other insurgent groups in Colombia have created a network in the Andes, which could be used for illegal transactions – be it natural resources or weapons (cf. Lee 2009). The tensions between states, such as Venezuela and Colombia, provide incentives to covertly support such separatist action.

Beyond the political turmoil and regional instability that such events would create, these trends also hamper adaptation to climate change, thus exacerbating its negative effects. Also, conflict parties can tap the Amazon rain forest as funding sources (illegal logging, mining, drug trade, etc.), which accelerates the savannisation process further (see below).

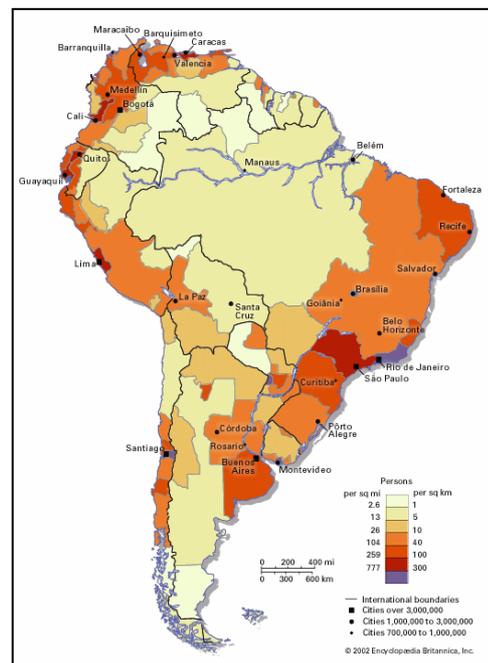
4.2 Amazon Settlement

Key Assumptions

- Governments turn towards the Amazon for economic development, and people migrate into the inner parts of the continent.

- Climate change exacerbates global resource crises, leading to increased foreign investment into the Amazon for food production and resource exploitation.
- The severity of climate change results in foreign interest to preserve the Amazon rain forests, leading to acquisition of land to be turned into protected areas.
- Limited conflict-sensitivity of governance, investments and development projects lead to grievances between pre-existing communities and “new arrivals”.
- Existing tensions may gain new momentum due to climate change implications and their effects on existing water regimes.
- New forms of conflict may develop under the impacts of climate change.

Several major urban areas, such as Lima, Quito, La Paz and others, may face serious challenges by the melting of the Andes glacier. Urban governance



Map 4: Population distribution in South America.
Source: Encyclopaedia Britannica 2009

already today is hardly able to cope with the influx of migrants and with urban growth. Vulnerable groups are often ignored in development plans, leaving them further marginalised. SLR threatens coastal areas. As large parts of the Amazon remain virtually uninhabited, migratory movements could shift: Moving towards the centre of South America could

replace moving to cities, or to North America and Europe (Lee 2009). Exploring these hinterlands of many countries thus becomes an attractive option to decrease population and resource pressures in coastal areas (see Map 4). Another incentive comes from aggressive global mitigation measures leading to a rapid decarbonising of the world economy: Many states, such as Venezuela, Ecuador, Bolivia and Colombia, are strongly dependent on fossil fuel exports for income and revenues. Alternative sources of funding – such as exploiting the Amazon rainforests – will then become necessary.

Government-sponsored programs or investments by large companies will provide the incentives for moving inwards. Large infrastructure program to build roads are currently under way and will facilitate access. The space is plentiful: Even if the entire estimated LAC population growth from 2010 until 2050 (approx. 140 million people) would move to Brazil, the population density would hardly double from 23 to 40 people per square kilometre (cf. UNPD 2008).

Moving inwards however, may not be free of conflict. Large indigenous communities currently reside in the Amazon basin. Migration triggers conflicts between “new arrivals” and local residents who feel threatened (cf. WBGU 2007), but also between those moving in. Given the limited statehood in the region, such conflicts will be resolved violently on occasion (Lee 2009). This development provides incentives for organised crime and illegal arms trade to move into the region; the insurgents in Colombia have ample experience in transport and networks for trafficking illegal goods. Thus, a new source of funding could open up for them as well as for other criminal organisations.

There are few precisely defined borders within the Amazon (Lee 2009). People moving in will inadvertently (or intentionally) cross borders, leading to an additional source of conflict between people of different citizenship. Such a situation could also become quickly politicised on an international level. It will arouse interests in clearly defining the borders, creating new lines of conflict. This risk is not limited to the Amazon basin, but may also materialise in Central America (Fetzek 2009: 17).

Two other global processes could aggravate the situation described above. First, the fertile Amazon basin is attractive to foreign investments. During and

after the 2008 food crisis, several countries started to buy land outside their territory for food production – a new “land grab”. The reason is to ensure food security and have extra land available for other purposes, such as biofuels. Financial speculation was among the reasons for the hike in food prices (Evans 2009). Anticipating decreasing food production provides incentives for investors to acquire land and thus artificially increase prices.

Second, in a world where climate change continues to accelerate, preserving the Amazon rain forest becomes a priority. Buying land would allow Amazonian countries to benefit from mitigation efforts while preserving biodiversity. However, this case implies adding more players with yet different agendas on how to use the land.

Thus, the question of benefit sharing arises. If it is perceived as inequitable, this will catalyse social protests – particularly if large swathes of land are used for food production for externals, but local communities have to starve as prices are too high, or if food is reserved for specific customers. A Madagascar-situation is conceivable: In Madagascar, a substantial land purchase by a South Korean company constituted the tipping point leading to crisis. The government was accused of giving away land too easily and making it unavailable for Malagasi workers. Also in the case that Amazon preservation is chosen instead of exploitation the following questions arise: Protected areas are removed from many economic activities, unless some form of valorisation such as eco-tourism is achieved (which may not outweigh the benefits of exploitation). Hence, protection reduces employment opportunities. In case a form of “fee” is paid periodically for preserving the forests, questions of benefit-sharing will also arise.

4.3 Climate-fuelled State Fragility

Key Assumptions

- Climate change increases poverty and reverses development: Agriculture, tourism, coastal urban areas, and critical infrastructures are all negatively affected by rising sea-levels, increasing disasters, decreasing precipitation and associated heat stress/droughts.

- The governments are unable to contain drug-related violence and organised crime.
- Decreasing governmental revenues as a result of agricultural decline and increased organised crime-related corruption degrades the states' capacity to implement policies. Public services (welfare, health, security, etc.) suffer and deteriorate.
- The governments become increasingly unable to mitigate climate-induced crises, such as global food crises, leading to social unrest and instability.
- The USA takes a narrow definition of national interests, thus river flows from the US to Mexico decrease significantly. Conflicts between Mexico and USA regarding crime fighting and (illegal) migration increase. Relations – political and economic – deteriorate further.

With a population of more than 100 million, a member of the G20, and an emerging power, Mexico is a major international player. However, the challenges of illegal migration and the drug trade, both moving mostly from Mexico into USA, are interlinked (Spring 2009). As a result of the latter, large-scale violence has broken out, which prompted the national government to deploy military forces. Mexico considers organised crime and violence related to narcotics national security issues (cf. Fetzek 2009)

Climate change will significantly add to these stresses. Agriculture will decline in Mexico unless new technologies are developed and applied, due to decreased precipitation and increased evaporation resulting from regional warming. With intensifying climate change, water-sharing agreements with the USA could cumulatively come under strain and threaten water supply for northern Mexico. Extreme weather events in the Gulf of Mexico are likely to increase, putting strain on coastal cities and infrastructure. Migration pressures towards the USA accelerates within Mexico but also from Central American countries, with migrants transiting via Mexico. If US immigration regulations are further tightened, the result is twofold: First, Mexico transforms from a conduit to a host country for migrants. Second, illegal migration increases, which would strengthen organised crime networks already involved in human trafficking (Spring 2009). The latter is also a key challenge to state authority in several

constituent states. As violence from the drug war has spilled over to southern US states, there is even more incentive for the US to further tighten border controls (cf. Galen 2009). Finally, the 2008 food crisis resulted in violent riots and protests in Mexico as food prices skyrocketed. Hence, climate change impacts elsewhere in the world and resulting crises affect Mexico's socio-political stability. While Mexico is relatively affluent compared to other Latin American countries, extreme price hikes exceed its capacity to acquire sufficient food.

The combination of stresses undermines state authority to the point that constituent states of Mexico may exhibit features of failed states, where the formal/legal economy is in ruins and non-state actors such as organised crime become de facto authorities. The situation would be similar to *favelas* in Latin American cities, but on a much larger scale. With governmental authority in regress, this would over time affect the central government as well (cf. Grayson 2009). Ultimately, Mexico or other Central American countries evolve into a "second Colombia", where the central government holds control only over some parts of the country.

The deterioration of Mexico is a regional threat multiplier, which would invite external intervention to curb the situation: The USA in particular has a record of becoming involved in drug-fighting activities in its southern neighbours.

4.4 Conclusion

Reviewing the constellations above shows that the major lines of friction are internal and structural: Unequal wealth and power sharing between different societal groups exist and could become further polarised. The range of outcomes is diverse, from local level violence to instability and secession movements. Such events can destabilise sub-regions and could **threaten the Andes region and Central America in particular**. In summary, the following developments are plausible:

A likely **pathway to climate-induced crisis** could look as follows: First, climate change and converging trends exacerbate socio-political frictions within a country. Concurrently, external pressures emerge, such as new food crises or external interventions. They could act as catalysts for political movements seeking to alter the situation – either by changing

governmental policies or opposing it, with secession being one possible option. If a political crisis emerges, harsh governmental reactions could incite instability and opposition movements could turn to violence. Once a violent conflict or similar event breaks out, it could become contagious and spread to other countries (see e.g. Brown 1996). As this will

likely lead to further environmental deterioration as a result of armed conflict, negligence or refugee movements (see UNEP 2009b), a vicious cycle could emerge. An important aspect will be the actions of extra-regional stakeholders (states and corporations alike), who could aggravate the situation.

5. Recommendations

Climate change is likely to exacerbate polarisation and social divisions where its impacts are not managed adequately or its negative impacts inequitably distributed. Improving **research and analysis** to identify future threats from regional to local level; improving **horizontal management** of climate change to **avoid contradicting policies**; developing **conflict-sensitive**, climate-proof policies; and **information dissemination** and **regional cooperation** on governmental and non-governmental levels will be critical to mitigate climate-induced threat multiplication.

Overcoming lines of friction which may be exacerbated by climate change will require investment in threat minimisers, such as improving good governance, equitable wealth sharing, promoting sustainable development and similar activities (see UNSG 2009 for more details). More information and analysis will be necessary to identify the concrete sub-regional impacts of climate change and to convince policy-makers of the need to act. Also, given the tense situation and disparities within the region, conflict-sensitivity is critical to avoid exacerbating existing challenges.

A **pathway to prevent a crisis** could look as follows: The knowledge base on climate change impacts is improved and strategies for early adaptation are developed. The knowledge is widely distributed to the public and also used to convince policy-makers of the tremendous costs of inaction. The focus is put on no-regret measures such as improved water and energy-efficiency, which have co-benefits such as reduced costs, improved water security and energy security. These co-benefits are distributed in an equitable manner, thus contributing to development and possibly reducing social disparities. The activities are designed in a conflict-sensitive manner so that vulnerable communities do not suffer from these actions. Furthermore, regional dialogue is initiated between countries with a view to coordinate actions across countries and to avoid contradicting policies. Thus resilience of societies towards climate-induced pressures increases.

There is a growing public awareness that weather patterns are changing (Fetzek 2009: 1). Key drivers are civil society organisations and external organisations, such as donor agencies and international organisations. Among the recent developments is the establishment of the “**Plataforma Climática Latinoamericana**”⁸, a network of South American civil society organisations engaged in natural resource management, climate change and other environmental affairs. The aim of the platform is to coordinate across the region, facilitate national multi-stakeholder dialogues, and exchange information to develop a common understanding and a common voice regarding climate change. Another recent development in this regard is a climate change and security project by the Royal United Services Institute (RUSI) together with Central American organisations (see Fetzek 2009). These activities can and should be harnessed to avoid potential impacts of the above mentioned scenarios.

Regarding awareness on climate change and security, aside from the USA, Argentina, Mexico and Guatemala also submitted perspectives to the UN report on possible security implications of climate change.⁹ Also, during the April 2007 debate on climate change and international security in the UN Security Council (UNSC), Argentina, Bolivia, Brazil,

⁸ www.plataformaclimaticalatinoamericana.org

⁹ The submissions are available at http://www.un.org/esa/dsd/resources/res_docugaecos_6_4.shtml (19 November 2009).

Mexico, and Venezuela addressed the body.¹⁰ The perspectives differed, but security implications of climate change were mainly framed in terms of water and food insecurity, negative impacts on development, and increased risk of disasters. However, while the seriousness of climate change was hardly questioned, linking it with 'hard' security and debating it in the UNSC was rejected, among others by Venezuela.

Regarding activities in context of the United Nations Framework Convention on Climate Change (UNFCCC), the majority of national communications are from the years 2000 to 2005.¹¹ Yet, vulnerability assessments within countries have been conducted on a case-by-case basis and are more anecdotic than systematic. Risk management and advanced planning are not very developed. Also, there is very little coordination within and between countries on the impacts of climate change, with virtually no regional cooperation mechanism in these areas. Climate change is seen largely as an environmental issue and thus receives only low priority. An exception is the USA, where the intelligence and defence community in particular has been active on producing studies and assessments (see Schwartz/Randall 2003; CNA 2007; Campbell et al. 2007; NIC 2009, 2009a, 2009b).

Against this background, more systematic research is needed in the light of recent findings of climate science to develop or update national adaptation plans. While potential 'hard' security perspectives on climate change are met with reservation, the countries are aware of potential risks of food insecurity and increased disasters.

The upcoming EU budgetary cycle and the institutional reform under the treaty of Lisbon opens a **window of opportunity** for the EU to mainstream the security implications of climate change into its foreign and development policy. In particular, **development cooperation will be the main instrument** in mitigating the challenges of climate change. A complementary use of thematic and national/regional programmes will be necessary to maximise the impact. The **regional strategies** of the EU and **country strategy papers** covering the

region will be key avenues for mainstreaming climate change.

In particular, the following activities should be pursued:

Research, Analysis and Methodologies:

- **Support research on climate change impacts** on national, provincial and local levels. Key research demands requiring action have already been identified (see Dumas/Kakabadse 2009) and should be conducted in preparation for the country strategy papers for the budget cycle 2013-2020.
- **Improve information dissemination** on climate change impacts and support the climate proofing of actions. In particular, identify how climate change will affect local communities and provide access to tools and information to help formulate policy responses.
- Identify how responses to climate change (e.g. mitigation, but also food security policies) could negatively impact countries and **develop conflict-sensitive approaches** to cope with them.
- Conduct **research on successful conflict prevention and adaptation** measures with the region and disseminate the results widely to serve as best practice.

Institutional Development and Response Formulation:

- **Invest in institutional capacity building** to improve national coordination of efforts, including whole-of-government approaches and/or inter-ministerial steering groups to mainstream climate change on a national level.
- **Promote the development of national strategies and scenarios** on climate change impacts: For instance, consider how climate change will negatively impact society within one generation, with a view to formulate responses informing country strategy papers. Assure that the results are published and communicated across the countries.
- **Assure that funds earmarked for adaptation projects will be used in a conflict-sensitive**

¹⁰ The meeting records are available at <http://www.un.org/depts/dhl/resguide/scact2007.htm> (19 November 2009).

¹¹ See www.unfccc.int.

way. Support capacity building and the creation of institutional mechanisms for stakeholder consultations. This includes post-disaster activities as well.

- **Improve coordination between EU policy areas** – foreign policy, trade policy, development, and other areas – to support mitigation of potential climate induced security implications, e.g. with regard to global food and energy markets.

Regional Cooperation and Dialogue:

- **Create space for regional dialogue** on climate change impacts on a political level. A political consultation (or a series of consultations for different sub-regions) should be initiated between the EU and Latin American countries. They should be repeated periodically to serve as a platform for dialogue, for governmental and non-governmental organisations alike. The results should inform regional and country strategy papers and be used to improve cross-country coordination, especially where policies (e.g.

damming) could have negative impacts on neighbours. The Organisation for American States (OAS) and the Andean Community are suitable candidates. A key aim of the consultations needs to be sensitising governmental agencies to the cross-cutting and cross-border impacts of climate change. Hence, consultations should proactively aim at engaging key ministries responsible for environment, economy, civil protection, science, education and defence.

- **Identify possible areas of bi- or multilateral cooperation** in Latin America by identifying synergies of aligned action, such as joint river management or sharing electricity production of hydropower plants. Proactively promote such cooperation by outlining the economic benefits and costs of non-action.
- **Improve networking between stakeholders** by supporting regional initiatives and civil society forums. This should include supporting the development of common visions and understanding of climate change impacts.

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