

# Climate Change: Food Security, Water & Forest Conservation

## SOUTHERN CONE

Andrés Gaudin in Buenos Aires

# Farming takes environmental toll

Expanding industry fails to take environmental damage into account.

The Southern Cone is on the brink of enormous strains on the food supply, a paradox for a region with an expansive farming industry, one that has proven environmentally damaging.

Since the mid-1900s, Argentina, Brazil, Paraguay and Uruguay – members of the MERCOSUR bloc – have adopted a growth plan based on the exploitation of natural resources, one that has proven unsustainable and a threat to the environment, says Uruguayan agronomist Fernando Queirós Armand Ugon.

Alexander Schejtman, a Chilean investigator at the Santiago-based Latin American Center for Rural Development, estimates that the food demand will increase by 50 percent by the year 2030 and that the number of malnourished individuals in Latin America will jump from 40 million to 170 million.

“Food production to satisfy the demands of a growing global population has brought agriculture and livestock farming to a large scale, with no control or vision of its negative impacts on the environment,” he said.

The United Nations Food and Agriculture Organization’s, or FAO, Report “Livestock’s Long Shadow: Environmental Issues and Options” found that the livestock sector world’s generates

more greenhouse gases than transportation, and is one of the principal causes of soil and water degradation.

“Even if the FAO report considers the world as a whole, for the MERCOSUR countries, net producers of foods – meats, dairy products, oils, cereals and fruits – it should be an inescapable reference point,” said Queirós Armand Ugon.

### Devastating livestock farming

The FAO report notes that humans are consuming more meat and milk as a sign of prosperity. The world meat production is closely tied with MERCOSUR, which is expected to double its production of meat from 229 million tons at the turn of 21st century to 465 million in 2050, and its dairy production from 580 million metric tons to 1.04 billion tons in the same period.

Lands for livestock farming currently cover 30 percent of the globe and a third of arable land, just to produce forage for animals. Deforestation for the industry is particularly dramatic in South America, where 70 percent of the deforested land in the Amazon has been used for livestock pasture.

Industrial agriculture leaves a clear and devastating effect on the environment, according to Spanish veterinarian Ferrán García Moreno, citing intercontinental transportation of food, intensive monoculture, deforestation and toxic agrochemicals impact on the soil and water resources.

The journal Proceedings of the National Academy of Sciences, a branch of Stanford University,



The expanding livestock farming industry is responsible for massive deforestation.

GREENPEACE

found that in nine Amazon states, between 2001 and 2004, deforestation totaled 93,700 square kilometers and farmland expanded by 36,000 square kilometers.

The MERCOSUR Press Agency — an independent organization with no relation with the bloc — found in 2008 that the industry, “by putting the world ecological system in check, it is not only the environment that is at risk, but cultures as well.”

The report found that indigenous groups who are especially reliant on nature are particularly vulnerable to the effects of climate change.

### Soy's domination

Large-scale export agriculture, particularly soy, could also have terrible effects on the environment. Queirós Armand Ugon, the agronomist, said monoculture for export in Uruguay increased from 8,000 hectares in 1998 to 700,000 currently.

A study by the Agronomy Department in the state-run University of the Republic of Uruguay found that there are 47 percent fewer dairy farmers over the last 10 years because of the growing soy business.

During 2007 alone, 150,000 hectares once used for dairy production were changed to soy fields, found the study, and 92

percent of the area used to produce the crop nationwide is under rent, so business owners have no commitment to preserve the quality of the soil.

“This production model works to exhaust the soil, to later go to new lands,” said the study.

Farming chemicals are also a problem in the country, where 6,778 metric tons were used in 2000 and 18,524 in 2008, mainly for transgenic soy plants, said Queirós Armand Ugon. The chemicals then go into the soil, rivers and swamps, and into other farms where important food crops, such as cereals, fruit and vegetables, are grown.

In a column published in Argentine daily *Tiempo*, Jorge Rulli, of the Rural Reflection Group, an environmental watchdog for MERCOSUR, wrote that Argentina's government should prioritize food production over any other activity despite how profitable it could be.

He also suggested limiting the expansion of soy farming in northern Argentina, where small-scale farmers and indigenous communities are settled.

“We propose a policy of stable prices for crops that are part of the basic diet of the population, recovering the old areas of family farming,” he wrote. □

## ANDEAN COUNTRIES

Milagros Salazar in Lima

# Higher temperatures spell trouble

Urgent measures needed to mitigate effects of rapid glacier melt.

For Andean countries, the ice-capped glaciers that tower above countless communities in the highlands are the water supply regulators and a sort of natural storage tank for the resource. Glaciers not only feed rivers and other bodies of water in the dry season, as their presence also affects weather. But as temperatures rise, they are melting rapidly, threatening water supplies that are tied to glaciers' precarious state.

Climate change has been noted to change even the water cycle itself, altering the quantities, speeds and distribution of precipitation.

Temperatures have risen so quickly that the human population has been unable to adapt to the subsequent rapid glacier melt.

“Studies show some trends, but we don't know when there will be intense rain or when we'll have a drought. The indicators or trends in the Andean world don't work anymore,” said Pedro Ferradas, who heads a disaster prevention program at the international development organization Practical Action-ITDG that provides technical assistance for low-income communities.

The melting Andean glaciers are one of the most dramatic examples of global warming's impact.



Global warming threatens water supplies as glaciers melt.

Peru has been the most affected. The country is home to 70 percent of the world's tropical glaciers, and is already particularly vulnerable to water shortages because some 70 percent of its population of 29 million people lives on the desert coast, home to 1.8 percent of the country's water supply. Some 98 percent is found on the other side of the Andes mountains in the Amazon basin.

But over the past three decades, 30 percent of Peru's glaciers have melted, an amount of water that could supply the capital Lima, a city of more than 8 million people, for a decade.

Quickly retreating glaciers have also affected Bolivia, which

holds 22 percent of the world's tropical glaciers; Ecuador, home to 4 percent, and Colombia, with 3 percent, according to the Andean Community of Nations. Glacier water supplies major cities in these Andean countries.

Only 3 percent of the earth's water is fresh water, and close to 80 percent comes from glaciers, while a fifth is subterranean and 1 percent is surface water.

#### Uncertainty awaits

Bolivia's iconic Chacaltaya glacier, at 5,300 meters above sea level, has disappeared, six years earlier than it was estimated to have completely melted.

Ecuador's Cotopaxi and Antisana glaciers have lost between one third and half of their ice cover, spelling bad news for the capital Quito, whose water consumption comes from those glaciers. Eight of Colombia's 15 glaciers are expected to completely melt in the next 50 years, and the other seven are averaging 20 meter-retreats per year over the last decade.

In the dry season or when rainfall is low, glaciers "are a fundamental source of water for the rivers that feed cities and serve as the raw material for hydroelectric plants," said Jorge Recharte, director of the Andean program at the Mountain Institute, a Washington-based organization that aims to preserve mountain environments around the world, including the Andes.

Of Peru's 3,044 glaciers, 1,129 are on the Pacific Ocean side

*Glaciers "are a fundamental source of water for the rivers that feed cities."*

— JORGE RECHARTE

of the Andes and supply the bone-dry coast with water.

"The support of that glacier water will depend on the flow and length of the rivers," said Llerena. "That's why it's important to research how much each glacier supports each river."

#### Water and mining

The health of the *páramos*, lush, high elevation (above 3,500 meters above sea level) glacier-formed and glacier-fed valleys, a sort of natural infrastructure, impacts lower-altitude zones.

But some of these areas are being threatened by mining, a highly-toxic industry that requires enormous amounts of water.

"How can you have both water and mineral exploitation?" asked Llerena. "There are circumstances in which you have to choose one resource."

Both large-scale mining and informal or small-scale mining pose major threats to rivers for contamination, which puts local farming at risk as well.

But adaptation may be the only way out. Ferradas says policymakers should take local community knowledge about water storage into account, such as the construction of artificial lagoons.

Land use for heavy industry that calls deforestation is another problem with impacts on biodiversity and climate itself. "These are parallel processes that affect one another," said Llerena. □

## BRAZIL

*José Pedro Martins in São Paulo*

# Warming's unavoidable consequences

Less deforestation is countered by high greenhouse gas emissions.

Climate change scientists in Brazil are scrambling to map out how higher temperatures may be causing irreversible damage to the country's biomes.

Government policies have aimed to combat deforestation, and while somewhat successful in slowing the trend, particularly in the Amazon Rainforest, known as the "world's lungs" since it absorbs vast quantities of greenhouse gases, the efforts may be too late as temperatures continue to climb.



Amazon forests are destroyed to make way for livestock.

INSTITUTO AMAZONICO AMAZONIA

Climatologist Carlos Nobre, a researcher of the National Institute of Space Research, or INPE, said the country now needs concrete measures to mitigate the effects of desertification in the semi-arid northeast and an area of 1.9 million square kilometers of tropical forest in the so-called Cerrado zone — the Goiás, Mato Grosso, Mato Grosso do Sul, Tocantins, Minas Gerais, Bahia, Maranhão, Piauí, and São Paulo states — a trend that could have a devastating impact, on industry, energy as well as the human toll.

### Deforestation slows

On Sept. 20, the Brazilian government unveiled an INPE study that estimated deforestation from 2009 to 2010 at around 5,000 to 6,000 square kilometers, a record low. In the previous two-year period, from 2008 to 2009, deforestation in the area totaled 7,400 square kilometers.

Deforestation is a major concern, as the trend in the region is responsible for 70 percent of the nation's carbon dioxide emissions, or 200 to 300 million tons of CO<sub>2</sub>, compared with the 90 million tons of CO<sub>2</sub> that is emitted from the burning of fossil fuels.

It is also a worry of Brazil itself, as higher temperatures could have a direct impact on the very Amazon region.

Some studies have pointed to a loss of biodiversity as species' habitats are degraded or destroyed entirely.

A study by the Center of Environmental Reference Information said that by 2050, with an annual increase of carbon dioxide in the atmosphere of 0.5 percent and 1 percent, 18 of the 162 species native to the Cerrado included in the study will become extinct, and 90 percent of them will lose their habitats.

The Cerrado is one of Brazil's most important biomes, covering 22 percent of the national territory. But unlike the Amazon, it was not considered national patrimony in the 1988 constitution, a fact that many environmentalists blame for prolonged deforestation.

"Protection for the rest of the Cerrado is urgent because it is greatly affected by the monoculture of sugar and soy," said Márcia Correa, an ecologist of the Species Diversity Protection Society.

A severe drought worsened matters for the Cerrado in 2010 that hit during the austral winter. Forest fires increased by 386 percent compared with the previous winter to 8,113.

One of the proposals to protect the forest is a certification program. Brazil already has one of the largest certified

Country	Cumulative area deforested (Km <sup>2</sup> )			% total area deforested through 2005	Annual deforestation (Km <sup>2</sup> /year)		
	1980-1989	1990-1999	2000-2005		1980-1989	1990-2000	2000-2005
Brazil	377,500	551,782	682,124	79.5	19,410	16,503	22,513
Peru	56,424	64,252	69,713	8.2	2,611	783	123
Bolivia	15,500	24,700	45,735	5.3	1,386	1,506	2,247
Colombia	19,973	27,942	29,302	3.4	n.a.	664	942
Venezuela	n.a.	7,158	12,776	1.5	n.a.	716	553
Ecuador	n.a.	3,784	8,540	1.0	212	378	388
Guyana	n.a.	n.a.	7,390	0.9	n.a.	n.a.	210
Suriname	n.a.	n.a.	2,086	0.2	n.a.	n.a.	242
TOTAL	451,924	666,076	857,666	100	23,619	20,550	27,218

Source: Environment Outlook in the Amazonia-GEO Amazonia; UNEP/ACTO, 2009

*“Some grade of climate change has become unavoidable, and Brazil has an infrastructure that depends greatly on natural resources.”*

— CARLOS NOBRE

areas in Latin America with 5 million hectares. Dozens of products with the seal of the Forest Stewardship Council, including furniture, cosmetics and other products, are on the market. Nevertheless, 40 percent of the certified areas are in the southern and southeastern regions of Brazil, meaning vast parts of Amazonia are not certified.

### Plans needed

The United Nations Intergovernmental Panel on Climate Change has warned that deforestation could also have a major impact on Brazil's production of coffee. Brazil is the world's top producer of the crop, and in the state of São Paulo, nearly 40 percent of the land is apt for quality arabica beans, more than 97,000 hectares.

But studies have shown that an increase in temperature of 1° C and a 15 percent increase in rainfall could slash that area by 10 percent.

Nobre says that climate change is unavoidable now, but that Brazil needs better adaptation plans.

“We're running behind developed countries that for years have discussed and prepared for adaptation,” he said. “Holland dedicates a good part of its gross domestic product to adaptation such as reforms to the dikes, and even the relocation of some of its population. But Brazil is also being surpassed by developing countries, such as Argentina and even small Caribbean islands,” Nobre warned. “Some grade of climate change has become unavoidable, and Brazil has an infrastructure that depends greatly on natural resources.” □

### thematic dossier

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Those Who Protect the Environment Most