

# GENDER, CHEMICALS AND WASTE

Gender Dimensions of chemicals and waste policies in Bolivia in relation to the Minamata, Basel, Rotterdam and Stockholm Conventions



## Case Study Bolivia, 2019 - 2020



BASEL / ROTTERDAM / STOCKHOLM  
CONVENTIONS



# Impressum

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## References

# Introduction

The scoping study on Gender, Chemicals and Waste was carried out in Bolivia from April to June 2019 by WECF and Reacción Climática to look at the gender dimensions of all three Basel, Rotterdam and Stockholm (BRS) Conventions as well as the Minamata Convention.

## Methodology

The scoping study sought to answer three key questions:

- How is women and men's health impacted differently by hazardous chemicals and waste?
- How do women and men's occupations and roles at home and at work influence their exposure to hazardous chemicals and waste?
- What best practices with women and men's leadership exist to substitute and eliminate hazardous chemicals and waste?

As part of the scoping study, leading scientists were visited and interviewed, as well as scientific institutions and national authorities responsible for chemicals and waste, and UN representatives working in the country. Interview questions were prepared based on the desk research carried out in advance of the scoping visit by WECF and experts.

On 12th June 2019, a stakeholder dialogue meeting was organized in La Paz with 30 key experts and stakeholders from governmental institutions, agencies, science and representatives of women and environmental organisations. Participants shared the latest research and developments in the area of chemicals, waste and the implementation of the BRS and Minamata Conventions.

Visits to identify the gender dimensions of chemical and waste hotspots, as well as good practices in the area of recycling and agro-ecology were organised. The visits included indigenous communities of the Beni River basin who are impacted by mercury used in gold mining extraction, indigenous farmers using highly hazardous pesticides, market vendors of highly hazardous pesticides, the capital's waste dump and several illegal dump sites including those used for asbestos waste.



Photo: Scoping study workshop in La Paz, Bolivia. Group photo with some of the civil society participants. Photo by Reacción Climática.

# CHAPTER 1

## GENDER EQUALITY



## CHAPTER 1

# Gender Equality

### Gender equality and women's rights in Bolivia

Many advances in legislation have been made to address women's rights in Bolivia over the last 10 years. One example is the 'Multisectoral Plan to advance de-patriarchization and the rights of women to live well' (Plan Multisectorial para el avance en la Despatriarcalización y el Derecho de las Mujeres a Vivir Bien). However, in the period spanning 2014 to 2018, the implementation of this plan was very weak, with little human and financial resources to implement it at a local and national level. A special inter-constitutional committee was created to fight violence against women, but there is no known action plan or budget to spur execution. In January 2019, a special cabinet was created for the fight to end violence against women and girls, as well as a 'Plurinational Agency for the well-being of women and the end of patriarchy'.

These plans and agencies are necessary, and should be sufficiently funded, to address the existing inequality that women face in Bolivia. The data to support this is clear. Four out of 10 women live in poverty. The salary gap is 37.8%. Only 48% of women have an income-generating activity and only 5% have a work contract that ensures a salary and social benefits (INE, Instituto Nacional Estadística 2019).

In some sectors, women are highly vulnerable to abuse and exploitation and need stronger legal support, for example, for sex workers. The Law No. 2450 should lead to reducing these inequalities by guaranteeing social security support for women and reducing precarious work. Despite Article 4 of the constitution, which stipulates that the state is independent of religion, there continues to be a strong influence by religious fundamentalists who fight against 'gender equality' and the human rights of people with different sexual identities.

Initiatives, such as the 'Observatory of Democratic Parity', exist to eliminate inequalities that women experience in the political field and indeed Bolivia now has many women

represented in political bodies. Despite this, structural barriers to women's equal participation remains in many areas, including in the political arena.

Violence against women is the greatest priority for gender equality. Every 3.5 days, a woman is assassinated in Bolivia (femicide). Human trafficking is another concern with 2000 people reportedly 'disappeared', many of whom are women (EPCVcM - Encuesta de Prevalencia y Características de la Violencia contra las Mujeres). About 75% of all Bolivian women are a victim of violence, according to a recent study (EPCVcM). This is much higher than the global average. Of all cases of violence brought to the juridical system, only 0.66% reach a verdict (EPCVcM).

The lack of sexual and reproductive rights, services, and comprehensive sexuality education are also a large concern, with 13,332 cases of girls under 15 years old giving birth (data for 2016)<sup>1</sup>. There are now just laws on sexual and reproductive health and rights (SRHR), abortion remains illegal and there is a strong push from religious fundamentalists against progress in this area. A major problem is ready access to contraceptives for youth in rural and indigenous communities.

A national, well-resourced campaign and support measures are needed to urgently act against this terrible violence and femicides.

## **Gender equality measures in the area of chemicals and waste**

The plurinational state of Bolivia has several key human rights and gender equality regulations and policies. The new constitution ensures equality of all people (of different gender, ethnic backgrounds, disabilities, age, religion) under the law. This constitution has led to several laws on gender equality and ending violence against women. This is critical because Bolivia has the highest rate of femicides in all Latin America - 1 woman is assassinated every three days.<sup>2</sup>

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<sup>1</sup> Sistema Nacional de Información en Salud (SNIS), 2016. In: Panozo, Eliana, 2020.

<sup>2</sup>Coordinadora de la Mujer. Available at:

<http://www.coordinadoradelamujer.org.bo/observatorio/index.php/tematica/2/cifras/2?PageNum=2>



DEPARTMENT AND AGE GROUP	2015	2016	2017	2018
<b>Bolivia</b>	<b>76</b>	<b>74</b>	<b>99</b>	<b>107</b>
15-20	8	13	15	23
21-30	36	22	39	31
31-40	18	15	21	24
41-50	3	8	9	13
51-60	5	5	3	6
61 or more	3	2	4	4
Not specified	3	9	8	6

Figure 1.1 Bolivia: Femicides by Department and Age Group, 2015-2018 (in number of cases). Source: INE: <https://www.ine.gob.bo/index.php/registros-administrativos-seguridad/>

In terms of legislation that may relate to chemicals and waste, an overarching Law of the Rights of Mother Earth was passed by the Legislative Assembly in December 2010. It defines Mother Earth<sup>3</sup> as "a collective subject of public interest," and states that both Mother Earth and life-systems (including human communities and ecosystems) as titleholders of inherent rights specified in the law. While it is the first law relating to the environment, it does not contain anything specifically related to gender equality.

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<sup>3</sup>Gaceta Oficial, 2012.

# CHAPTER 2

## CHEMICALS AND WASTE



## CHAPTER 2

# Chemicals and Waste Regulatory and Institutional Framework in Bolivia

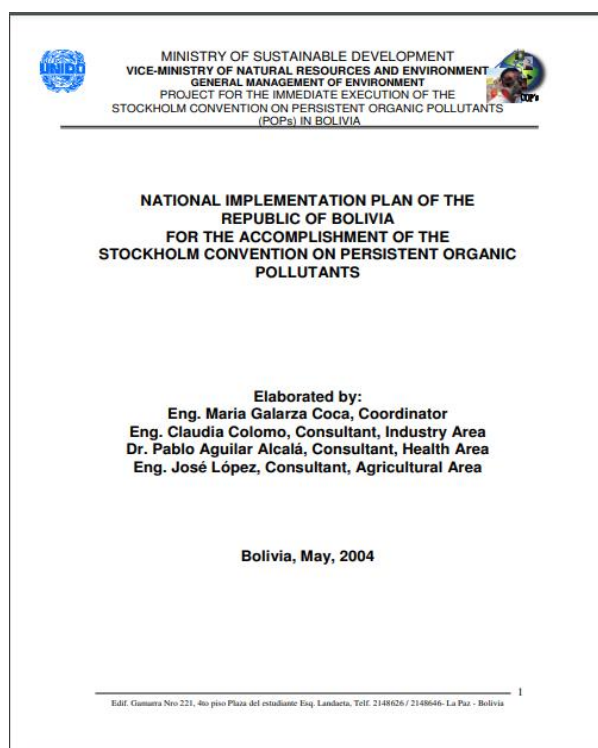
The Law of Mother Earth provides the overall framework for environmental protection. The international BRS conventions are integrated through this framework. A national program to address Persistent Organic Pollutants (POPs) according to the Stockholm Convention was created in 2005, called “Programa Nacional de Controle da Poluição Industrial” (PRONACOP).

Since 1999, Bolivia has applied the Basel Convention to forbid imports and exports of hazardous Waste (environmental law Artículo 31º de la Ley 1333). Bolivia ratified the Minamata Convention on Mercury in 2015 through Law 759 and, since August 2017, this convention has been enforced. The conventions are being addressed in a coherent manner, with the overall aim of protecting human health and the environment from hazardous chemicals and substances. The health impacts from hazardous chemicals, as presented by the Bolivian Ministry of Environment at a stakeholder meeting include:

- Birth defects
- Damage to the function and tissue in liver and kidneys
- Disruption of the central nervous system
- Impacts on the nerve system
- Increase of hyperactive behaviour
- Cause of Attention Deficit Syndrome
- Increase of depression among children
- Disruption of the immune system
- Increased probability of cancer
- Cause of specific cancers such as: liver, kidney, lungs, reproductive organs (testicles, ovaries, breasts)
- Reduced fertility

The Ministry of Environment and Water of Bolivia is responsible for the implementation of the BRS and Minamata conventions, which is currently covered by a 2-person technical staff department. There is an obvious lack of capacity at all levels of government institutions to implement the BRS and Minamata conventions.

The 1st National Implementation Plan for the Stockholm Convention was valid from May 2004 to 2019 (UNEP BRS Convention Secretariat)<sup>4</sup>.



The 2<sup>nd</sup> National Implementation Plan for the Stockholm Convention was being finalized in 2019 and is not available to the public. After several years, a project to contain polychlorinated biphenyl (PCB) oils and prepare them for destruction has obtained funding from the Global Environment Facility (GEF).

In June 2019, the government embarked on a program focusing on gender in the management of PCBs, funded a.o. by GEF and the United Nations Industrial Development Organization (UNIDO). The overall objective of the PCB management project is to gradually

<sup>4</sup> Bolivia, 2004. Available at:

<http://www.pops.int/Implementation/NationalImplementationPlans/NIPTransmission/tabid/253/ctl/Download/mid/13657/Default.aspx?id=20&ObjID=6331> English version available at: <http://open.unido.org/api/documents/5257009/download/NATIONAL%20IMPLEMENTATION%20PLAN%20OF%20THE%20REPUBLIC%20OF%20BOLIVIA%20FOR%20THE%20ACCOMPLISHMENT%20OF%20THE%20STOCKHOLM%20CONVENTION%20ON%20PERSISTENT%20ORGANIC%20POLLUTANTS> )

end the use of PCB-containing equipment by 2025 and the destruction of PCBs by 2028. Due to the recent change of government, the programs are currently on hold.

The Bolivian Strategy for Biodiversity Protection (2019-2030) was recently launched, and the ministry aims to add a gender perspective. This will ensure that women have equal access to the ‘sustainable use’ of biodiversity, as well as contributing to drafting norms and laws and equally sharing benefits from proceeds.

Table 2.1. Bolivian Strategy for Biodiversity Protection (2019-2030)

Action Areas	Priority Actions	Target 2020	Target 2025	Target 2030
Develop the normative mechanisms and instruments to ensure that women participate equally in the integrated sustainable management of biodiversity (GISB)	Formulate criteria to ensure as well as evaluate the equal inclusion and participation of women in the GISB	Develop the theoretical framework and methodology of the national assessments of  a) The situation of women in the area of biodiversity  b) Value the Roles and knowledge that women contribute to GISB	Elaborate and disseminate the analysis of the gender situation, the knowledge contributed by women, in the area of Biodiversity,  Develop criteria to ensure and evaluate the equal inclusion of women in GISB  Complement and adjust the national legal mechanisms and instruments	Implement at national and subnational level the legal mechanisms and instruments to ensure equal participation of women in GISB
	Adjust the normative programs and projects to obtain the equal participation			

Figure 2.1 Source: Ministry of Environment and Water, Strategy and Action Plan for Biodiversity Protection 2019-2030

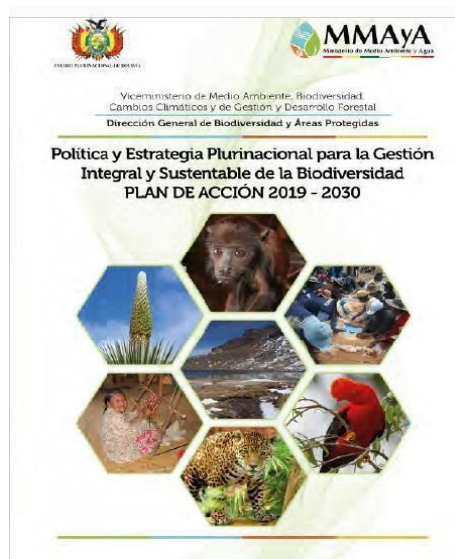


Figure 2.2. Cover of the Bolivian Strategy and Action Plan for Biodiversity Protection report (2019-2030). Source: Ministry of Environment and Water 2018.

The strategy to ensure a gender focus in the Bolivian Strategy for Biodiversity Protection can also be applied to the Chemicals and Waste conventions. Questions from the stakeholders looked at the (very) long timeframe for starting to ensure a gender perspective in the biodiversity strategy. Other questions looked at the need to have an overall gender focus for the combined BRS and Minamata Conventions implementation.



Figure 2.3. Timeline of environmental legislation in Bolivia. Data obtained from MMAyA PowerPoint Presentation 2019 by Miroslava Castellon, Ministry of Environment and Water at the workshop held for this Gender and Chemicals scoping study.

In Bolivia, the Law RAAM - Environment Regulation on Mining Activities (31/07/1997) states that the use of mercury in the mineral concentration process is only allowed when installing mercury recovery equipment to process the output. However, enforcement is the biggest challenge for the Bolivian government.

# CHAPTER 3

## ISSUES OF CONCERN



## CHAPTER 3

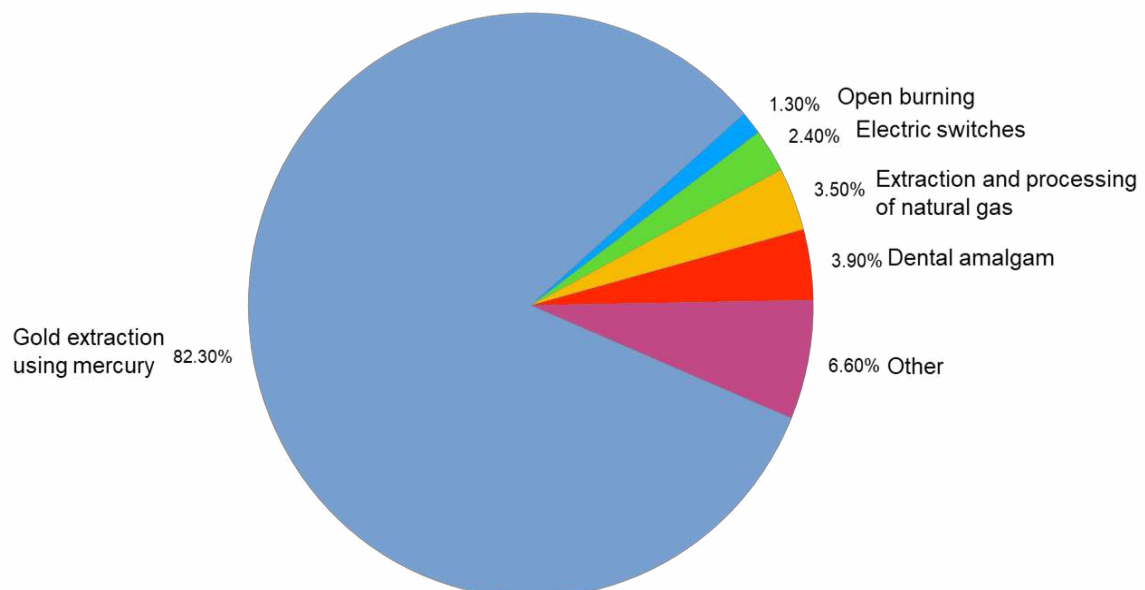
# Issues of Concern

## Mercury

Bolivia has become the second highest emitter of mercury from gold mining activities in Latin America, after Colombia. Historically, Bolivia in pre-Colombian times also produced gold but without using mercury. The gold mining areas where mercury is, or was, used seem to suffer from significant mercury pollution.

Bolivia ratified the Minamata Convention in 2016. A mercury inventory conducted in 2017 showed about 45.7 metric tons of mercury per year released into the environment. As shown in Figure 3.1, the major source of mercury emissions in Bolivia was from the gold mining process (82.3%), followed by other sources (6.6%), dental amalgam (3.9%) and extraction and processing of oil and natural gas (3.5%) (MMAyA, 2017). However, another report stated that the amount of mercury released to the environment from the ASGM sector was 113 metric tons (Galvis, 2019).

Figure 3.1 Mercury emission from various sectors in Bolivia (MIA, 2017).



Data from studies carried out near La Paz in an artisanal gold mining community (Villa Ingenio) show high levels of soil pollution not only in the mining area, but also where the miners' families live (see Figure 3.2). Approximately 70,000 small-scale gold mining workers are believed to use mercury. Mercury levels in soil were high where ore is added to tumblers



and where the amalgamation was done (vapours). Families of the miners in Villa Ingenio were living in areas with contaminated soil. Finally, women often do the amalgamation in their kitchens, with children around, and no exhaust ventilation (Hentschel et al. 2002 & Savornin et al. 2007).

The latest import data suggest a strong increase in mercury imports (CEDIB and Figure 3.3). The Bolivian Centre for Studies and Documentation (CEDIB) presented figures showing that 25% of the total world market for mercury is imported into Bolivia from Mexico. About 150,000 to 200,000 kilograms of mercury (ca. 150 to 200 tons) are being imported to Bolivia in the last couple of years. This is an enormous increase compared to the years before 2015.

Researchers found out that plants near ASGM at high altitude contain  $>0.1$  mg Hg/kg, potentially leading to the accumulation of mercury into the food chain. Moreover, erosion of soils from ASGM processing sites is a significant mercury contamination for the lower Amazon basin (Teran-Mita, Faz et al. 2013).

Bolivian newspapers reported that mercury can be obtained in many weakly controlled border areas as well as in cities like La Paz, Cobija, Trinidad, Santa Cruz, Oruro, and Potosí. In Bolivia, to produce 1 kg of gold, miners used 36 kg of mercury (Galvis, 2019).

Three known cinnabar deposits exist in Bolivia: one located between Peñas and Huarina (Maria Paz mine), one on the border between the Oruro and La Paz departments (El Triunfo mine), and one in the Lliqui mountains on the Tumusla River (Emilia mine). All three of these are very small and are not currently being actively mined (Galvis, 2019).

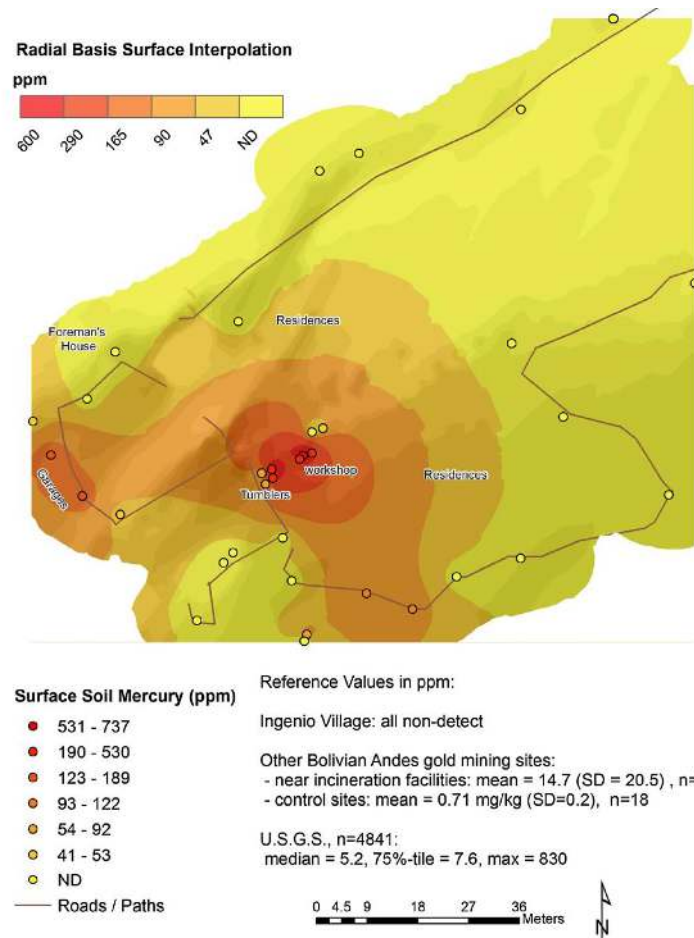


Figure 3.2 Surface soil mercury levels at Yani Mine, Cordillera Real Mountain range, Bolivia. Source: Johnson, Pavilonis et al. 2018

Given the lack of cinnabar deposits and the inactivity of primary extraction from existing deposits, all mercury used in Bolivia is imported. The question is therefore whether Bolivia is actively re-exporting mercury to other countries (as other countries have taken measures under the Minamata convention which Bolivia may have not yet done) or the gold produced in Bolivia is highly under-reported. As shown in Figure 3.4, more than 25% of the total world mercury flows are imported to Bolivia. Bolivia is importing several hundreds of tons more mercury than it would need to extract the gold ore it is reporting, which could indicate that part of the imported mercury is informally exported elsewhere.



Figure 3.3 Circa 25% of total world mercury flows are imported to Bolivia. Source: based on UN COMTRADE, 2019 presented by Oscar Campini “Trade in mercury for the gold mining sector in Bolivia - preliminary research results (2019)”.

Nevertheless, increased mercury uses and the expansion of gold mining by foreign actors, seem to indicate that the negative health impacts are increasing as well. The most impacted indigenous communities used to be nomadic but are being forced into a sedentary lifestyle, leading to a less varied diet, more potential exposure to mercury, and more potential conflicts. Studies show high mercury concentration in the soil and mercury vapour above the safe level recommended by US EPA and WHO (Pavilonis et al. 2017).

### Field Visit Results from the Beni River Basin

On the border and partly inside the Madidi National Park, the Beni River is reported to have the highest use of mercury in the country. This hotspot was visited as part of the scoping study (Bourgoin & Alanoca 2003).

To assess the impact of mercury, an area was designated that was part of the basin of the Beni River. Here, the project experts visited two indigenous municipalities of the community of Guanay as well as the community of Eyiyo Quibo in the municipality of San Buenaventura. The distance of the river between the two populations is around 160 km.

In every visit the project experts looked for women to interview in order to have their points of view heard regarding mercury. Men, of course, were also interviewed since they also work with mercury for gold mining. Experts chose to work with two indigenous tribes: Lecos and

Esse Ejjas. Both are nomadic tribes of North La Paz, and it is quite interesting to see how their way of life has changed and is still being threatened by gold mining in the region.

The project experts also visited the office of the Madidi National Park to do interviews with local inhabitants. One such interview was with the Head of the Biodiversity Protection Department of Madidi National Park. He reported that the Madidi National Park is also affected by mercury used for gold mining.



Figure 3.4 Field visit locations in the Beni River Basin, Madidi National Park. Photo obtained from Google Earth.

While there are few studies to measure the impact, he could see that the biodiversity of the area is adversely affected. Tourism in the area must compete with mining activities, which struggles as mining brings in more money. He concluded by saying that alternatives to mining must be put in place in order to conserve biodiversity.

The highest use of mercury was reported in the Beni River basin in the Madidi National Park region (Bourgoin & Alanoca 2003; Barbieri, Cournil et al. 2009; Tschirhart, Handschumacher et al. 2012). The Esse Ejjas and Lecos Indigenous communities in the Beni River basin are particularly impacted, as their main diet consists of fish from the river where gold is mined and processed with mercury.



Photo 3.1 Interview by Carmen Capriles with Mr. Howard, member of the Biodiversity Protection Department, of Madidi National Park. Photograph taken by Daniel Flores, April 2019.)

Reacción Climática organised a second field visit to the Beni River Basin in April 2019. The main source of mercury in the Beni River comes from gold mining activity which is practiced along the river. Gold mining in the river is mostly done with large ‘dredges’ which are owned by international companies, mostly from China. According to Lopez Tarabochia in the Mongabay publishing site, over 130 tons of mercury are emitted every year (Lopez Tarabochia, 2016).



Photo 3.2 One of the gold mining ‘dredges’ in the Beni River. Image from video taken by Alex Villca Limaco. Source: <https://youtu.be/YoHNUFT7Ri8>

### Field Visit Results from the Lecos Indigenous People in Guanay

Reacción Climática organised a second field visit to Guanay in April 2019. The municipality of Guanay is made up of the Lecos Indigenous People. The project expert interviewed Silvia Lipa, the deputy Mayor and an indigenous women’s leader from the Lecos Nation. She explained how indigenous people are starting to get involved in gold mining in order to obtain an income.

The population of Guanay neither live on the riverbanks nor eat a lot of fish from the river. They are implementing new aquaculture projects with own fish-pools near their houses. Local women leaders from the Lecos nation shared the information with us that both women and men work in the gold mining sector, but there had been seen cases where women became ill, potentially due to the use of mercury. They also alerted us that in addition to mercury, cyanide is also being used.

The municipality is working on “environmentally friendly alternatives to mining” with agricultural projects that include apiculture, aquaculture and some livestock.

It is important to point out that the Lecos people used to be a nomadic tribe and therefore they did not practice agriculture before. They also told us that the campesinos (intercultural, not indigenous) are the ones that produce most of the food and only in recent years have the Lecos people begun agricultural practices.



Photo 3.3 Photos from the Field Visit of the Lecos People in the Municipality of Guanay. Left Ms Reyna Saravia and right Deputy Mayor Silvia Lipa, with Carmen Capriles of Reacción Climática, briefing about the gold mining concessions in the rivers of their indigenous territories and the use of mercury and cyanide. Photos taken by Daniel Flores in April 2019.

### Field Visit Results from the Esse Ejjas Indigenous People in Eyiyo Quibo

The community of Eyiyo Quibo is almost entirely composed of Esse Ejjas people. The Esse Ejjas people call themselves the people of the river since they moved along the river. They do not have a recognized territory and only recently an evangelical mission bought some land for them, so they may have certain territorial claim, but it is minimal. The population's diet is based on fish and bananas, and it is estimated that they have the highest level of undernutrition in the country. To make matters worse, they now also face mercury contamination of their fish, which is their main source of protein.

A study by Benefice (Benefice 2010) carried out in 2007 came to the following conclusion: "Women displayed a mean level of mercury in hair of  $5.4 \pm 4.3 \mu\text{g/g}$  (min: 0.15; max: 20.08  $\mu\text{g/g}$ ) and children and adolescents of  $5.3 \pm 4.5 \mu\text{g/g}$  (min: 0.08; max: 34.14  $\mu\text{g/g}$ ). A significant relationship between mercury in hair and fish consumption obviously exists. There is a correlation as well with belonging to a particular ethnic group (Esse Ejjas) or a subsistence activity oriented towards fishing."

This study also showed that stunting prevalence was 38.9 %, and 85.2% of children were infected by intestinal helminths. There were no cases of undernutrition among mothers but 39.8% of them were anaemic. Infant or child mortality was high up to 20%. These facts correspond to the very poor living conditions and health. Their analysis also stressed on the role of fish consumption and lifestyle as risk factors for contamination. Among 5-10-year-old children, there were significant and positive relationships between nutritional indices and the mercury content of hair (Benefice, Luna-Monrroy et al. 2010).



Photo 3.4 The Esse Ejjas indigenous peoples' main source of food is fish from the river. These pictures show the main types of fish, the pacu and two types of catfishes, the pintado and benton. Reacción Climática's hypothesis is that the mercury used in the gold mining, collects in the fish, and from there, in the inhabitants of the region. Reacción Climática has therefore taken hair samples from women of the Esse Ejjas peoples, which are being tested on mercury levels in an approved international laboratory. Photos by Daniel Flores in April 2019.





Photo 3.5 Esse Ejjas community: Eyeyoquibo leader registering hair sample collection for testing on mercury content by Carmen Capriles of Reacción Climática. Photo by Daniel Flores in April 2019.



Photo 3.6 Women of the Esse Ejjas Community speaking with a Bolivian Environmental Rights Defender showing them pictures of the Dredges in the rivers and explaining the mercury pollution impacts. Photos by Daniel Flores in April 2019.



Photo 3.7 Image from the Field Visit of the Esse Ejjas Indigenous People in Eyiyo Quibo. Hair sampling for mercury levels. Photographs taken by Daniel Flores, April 2019.

### Results of the Mercury testing with the Lecos and Esse Ejjas Indigenous People

As part of the scoping study, 65 hair samples were taken from women communities living in two Amazon region of Bolivia affected by gold mining using mercury. The hair sampling was conducted in collaboration with IPEN (International Pollution Elimination Network), using the scientific protocol provided by an accredited laboratory. The hair samples were analysed by the laboratory based in the USA. It analysed hair samples from many countries so that they can be compared. The results of the Bolivian hair samples are extremely worrying. They are amongst the highest found in the global study (Bell, L., Evers, D & Burton, Mark. 2021).

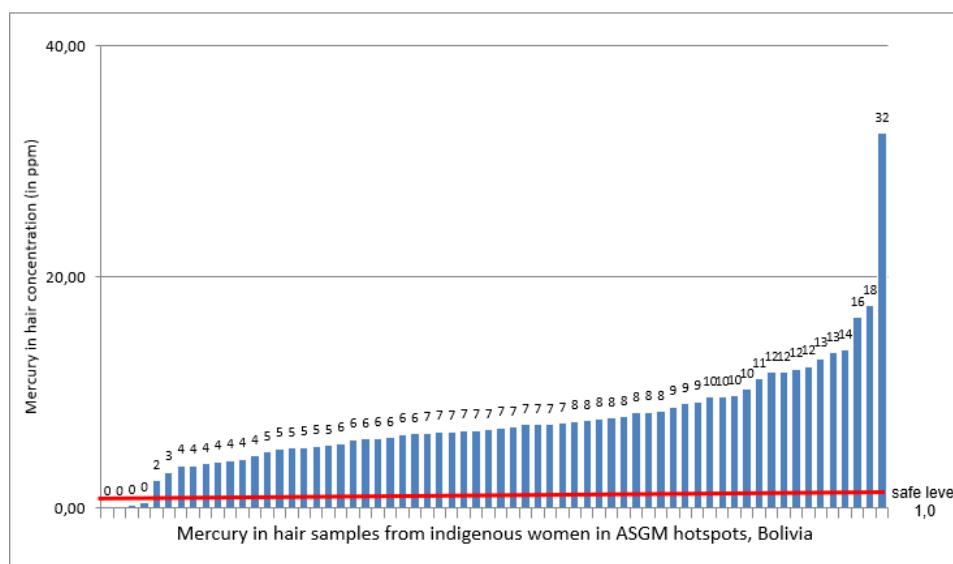


Figure 3.5 The results of mercury in hair samples of women from indigenous communities in the Madidi National Park, the samples have a high concentration of mercury and are way above the safe level. The four samples below 0,1ppm are from control group.

Figure 3.5 and Figure 3.6. show that all participants, women between 18 and 55 years of age, living in the indigenous communities had very high levels of mercury in their hair, which is an indicator that mercury has accumulated in their bodies and that women who have children, will transfer mercury contamination to their child during lactation and pregnancy. All women who were tested from the indigenous communities of Eyiyo Quibo and Portachuelo had levels above 1,0 parts per million, which is set as the maximum safe level according to the World Health Organisation. The recommended level is below 0,58 ppm.

Location	No. of samples	Mean Hg concentration (in ppm) with St Dev	No. of samples greater than 1 ppm	Percentage of samples greater than 1 ppm	Percentage of samples greater than 0.58 ppm	Highest mercury level (ppm)
Eyiyo Quibo	25	8.95 ± 6.34	25	100.0%	100.0%	32.4
Portachuelo	35	6.44 ± 2.18	35	100.0%	100.0%	11.75
Control group	4	0.20 ± 0.17	0	0.0%	0.0%	0.43
<b>Total</b>	<b>64</b>	<b>7.58 ± 4.76</b>	<b>60</b>	<b>100.0%</b>	<b>100.0%</b>	<b>32.42</b>

Figure 3.6 Hair sampling results compared to the WHO reference standard 1 ppm and the proposed concentration of mercury 0.58 ppm. Source: Bell, Lee et al. (2021).

Figure 3.6 shows that the Bolivian indigenous women of the Eyiyo Quibo group and the Portachuelo group had, by far, the highest levels of all participants in the global mercury contamination study. Most women had levels above 3 ppm up to 32 ppm.

Worrying is that the women participants are not involved in gold mining activities, thus the exposure cannot be linked to an occupational hazard. The indigenous community of Ejjas in the Portachuelo region, are traditional river-nomads whose diet chiefly consists of river fish, such as catfish. It is plausible that the gold mining in the river is contaminating the fish population with methylmercury, which accumulates in the food chain, and in the people eating the river fish. The high mercury body burden can be a result of fish contamination with methylmercury.

One outlier hair sample found had an extremely high level of mercury of 181.3 ppm. This sample has been excluded from the analysis, and the participant has been informed and has been asked how this contamination could have happened. A first indication is that this extreme level of mercury contamination could have been caused from scavenging in a waste dumpsite where there was mercury-containing waste.

### **Next steps and follow-up**

The mercury testing during the scoping study is only a first indication that the mercury pollution situation in the Madidi National Park and rest of the Amazon region of Bolivia might be extremely serious. It is essential that the Bolivian authorities, with support of international organisations, carry out in depth studies of the contamination. In particular, it is urgent to test the different types of river fish on mercury content, so that measures can be taken to inform the inhabitants on which fish to avoid.

Further urgent measures need to be taken to halt the imports of mercury into Bolivia, which are estimated to be amongst the world highest. Legal measures need to be taken immediately to stop the use of mercury in the rivers that flow through the Madidi National Park. The Park has one of the highest biodiversity levels in the world, but not only humans, also the fauna in the park is at risk from mercury pollution (see recent publication on mercury and biodiversity by UNEP, 2021). The longer-term aim of all measures should be to restore the Madidi region to its original ecosystem health, allowing the indigenous peoples to continue to live their traditional livelihoods. For the time being, however, the affected

populations should be provided with information and alternative sources of safe food by the government. For the Lecos community, which live on land, support for alternative livelihood activities such as fish farming on uncontaminated land and other forms of sustainable agroecological activities should be supported by government programmes.

## POPS in Agriculture

**75% of Bolivian farmers use restricted or forbidden pesticides** (Jørs et al. 2006). Several important research studies have been carried out in Bolivia in the last years on the use of obsolete and banned pesticides by farmers, their health impacts, farmer suicide rates as well as on continued exposure and health impacts from DDT through contamination via food.

Pesticide use is probably one of the largest toxicological problems in Bolivia. In a study by Jørs et al. (2006), 186 farmers (9% women) were interviewed to assess occupational pesticide intoxication. Here, they found that 70% of men reported intoxication symptoms. Unfortunately, data was lacking on indirect intoxication of women and children through washing of pesticide polluted containers, use of containers, and clothing, to name a few. Shockingly, more women (61%) than men use pesticides to attempt suicide (39%), although more men die from doing so (70%) (Jørs et al. 2006).

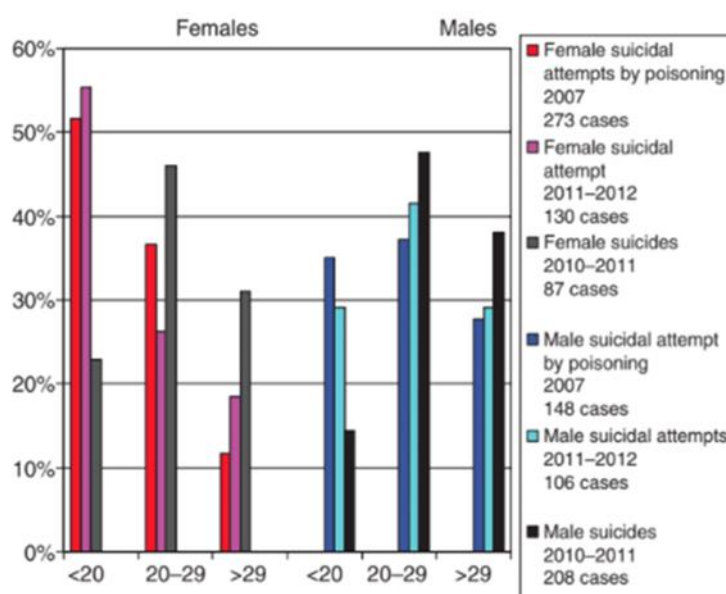


Figure 3.7 Gender distribution among cases of suicide attempt and suicide stratified by age. Obtained from Jørs et al. 2006.

There is a gaping discrepancy on which products are considered forbidden pesticides. According to the Ministry of Environment and Water (MMAyA) the list of forbidden

pesticides contains less than 20 entries.<sup>5</sup> However, according to the National Service of Agricultural Sanitation and Food Safety's National Unit of Vegetable Sanitation there are over 2020 registered forbidden products which can be found on their webpage.<sup>6</sup>

During the scoping study, the project experts visited a farming family. They produced fruits, vegetables and flowers. They showed that the imported flower bulbs were easily attacked by pests. Therefore, they used Aldrin and other pesticides of which they did not know the names. They told the interviewers that they were unaware of any health or environmental risks related to the pesticides. They also did not use any protective gear while spraying the field. When asked how they obtained pesticides such as Aldrin, they informed us that they buy them at the market in El Alto.

Reacción Climática and WECF visited the market, "16 de Julio", in El Alto, which is the biggest market in the region. Next to the teleferico (cable car) station, we found a few stalls selling pesticides, including pesticides on the Stockholm Convention list of forbidden pesticides or candidate POP pesticides. We also found ALDRIN and PARAQUAT (under the name of Synotquat) in addition to other pesticides of high concern such as Glyphosate (under the name of Bazuka).



Photo 3.8 Market stall in El Alto selling banned pesticides, i.e. Aldrin, Bolivia. Photograph taken by André Magon, Reacción Climática, June 2019.

<sup>5</sup> Available at: [https://www.mmaya.gob.bo/index.php/informacion\\_institucional/content,1732.html#](https://www.mmaya.gob.bo/index.php/informacion_institucional/content,1732.html#)

<sup>6</sup> In: <http://www.senasag.gob.bo/egp/productossv1.html>.

## LISTA DE PLAGUICIDAS PROHIBIDOS Y RESTRINGIDOS EN BOLIVIA

El Ministerio de Medio Ambiente y Agua (MMAyA) conjuntamente el Ministerio de Desarrollo Rural y Tierras (MDRYT), a través del Servicio Nacional de Sanidad Agropecuaria e Inocuidad Alimentaria (SENASAG) y el Ministerio de Salud, han desarrollado la siguiente lista con el fin de aportar claridad sobre los plaguicidas prohibidos y restringidos, de modo que los productores y público en general este informado sobre qué plaguicidas tienen características altamente peligrosas y no deben ser utilizados para una producción.

Disposición Legal	PLAGUICIDAS PROHIBIDOS	Justificativos técnicos
Resolución Administrativa SENASAG Nº 023/2005 de fecha 22 de febrero de 2005.	1.- Dieldrin 2.- Endrin 3.- Toxofeno 4.- Mirex 5.- Dicloro Difencil Tricloroetano 6.- DDT 7.- Clordano 8.- Hexaclorobenceno 9.- Aldrin 10.- Heptacloro 11.- 2,4,5-T Endosulfan y sus mezclas.	<ul style="list-style-type: none"> <li>Por el riesgo y daño que puede provocar el uso de los Contaminantes Orgánicos Persistentes (COPs), en la salud humana, la biodiversidad, persistencia y propiedades de bioacumulación en el ambiente.</li> </ul>
Resolución Administrativa SENASAG Nº 024/2015 de fecha 16 de marzo de 2015	Endosulfan y sus mezclas.	<ul style="list-style-type: none"> <li>Sustancia química dañina para la salud como para el medio ambiente.</li> <li>Está incluida en el anexo A del Convenio de Estocolmo y en</li> </ul>

MINISTERIO DE MEDIO AMBIENTE Y AGUA  
Calle Cop. Cañabito N° 434, Avda. Ar. 30 de Octubre y Héroes del Sur • Tel.: 2105577 • Fax.: 2105573 • [semas@mma.gov.bo](mailto:semas@mma.gov.bo) • [www.mma.gov.bo](http://www.mma.gov.bo)

Resolución Administrativa SENASAG Nº 023/2005 de fecha 8 de abril de 2005	Monocrotophos y sus mezclas.	<ul style="list-style-type: none"> <li>el anexo III del Convenio de Rotterdam, forma parte de los Contaminantes Orgánicos Persistentes (COPs), y sujeto al procedimiento de consentimiento previo fundamentado.</li> <li>Par ser altamente tóxico para la salud humana y por causar daños al medio ambiente. Incluido en el Anexo III del Convenio de Rotterdam.</li> </ul>
Resolución Administrativa SENASAG Nº 170/2005 de fecha 2 de diciembre de 2005	Methamidophos y sus mezclas.	<ul style="list-style-type: none"> <li>Altamente tóxico a la salud y el medio ambiente.</li> <li>Incluido en el Anexo III del Convenio de Rotterdam.</li> </ul>
PLAGUICIDAS QUÍMICOS DE USO AGRÍCOLA RESTRINGIDOS		
Disposición Legal	Plaguicidas	Justificativos técnicos
Resolución Administrativa SENASAG Nº 186/2015 de fecha 18 de diciembre de 2015	Methomyl y sus mezclas. Restringe el uso, la importación y comercialización de "insectos" en la "ETIQUETA DE USO RESTRINGIDO" y "VENTA BAJO RECETA PRESCRITA POR UN INGENIERO AGRÓNOMO".	<ul style="list-style-type: none"> <li>Se autoriza su importación, comercialización y uso en solo para cultivos de soya, maíz y trigo, bajo receta prescrita por un Ingeniero Agrónomo acreditado ante el SENASAG.</li> <li>Es nocivo para la salud y el medio ambiente, pero se puede mitigar los riesgos con restricción en el uso de plaguicidas químicos de uso agrícola a base de methomyl.</li> </ul>

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Figure 3.8 (Top and Bottom). List of banned and restricted pesticides in Bolivia (2019). Available at: <https://www.mmay.gov.bo/informacion-tecnica/lista-de-plaguicidas-prohibidos-y-restringidos/>

<<<< PAGINA 1 >>>>  
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Nro. Registro	Nombre Comercial	Ingrediente Activo	Clase	Tipo	Cat. Tox.	Formulación	Fabricante, Formulador	País origen	Caducidad	Titular de registro
0062	2,4 - D	2,4 - D SAL AMINA	Plaguicidas	Herbicida	III	CONCENTRADO EMULSIONABLE	BIESTERFEL U.S. INC, NEW YORK	Estados Unidos	23/08/2006	AGRIPAC BOLIVIANA CIA. LTDA.
M117	2,4 - D ICONA AMINA	2,4 - D	Plaguicidas	Herbicida	III	CONCENTRADO SOLUBLE	ICONA S.A.	Argentina	09/08/2005	ICONA S.A.
1601	2,4 - D POINT	2,4 - D	Plaguicidas	Herbicida	II	CONCENTRADO SOLUBLE	NANING CF AGROCHEMICAL CO., LTD.	China	15/09/2014	AGROPOINT S.R.L.
1718	2,4 D SUPER AMINEX	2,4 - D SAL AMINA	Plaguicidas	Herbicida	II	CONCENTRADO SOLUBLE	CHANGZHOU WINTAFONE CHEMICAL CO., LTD.	China	21/04/2015	AGROINDU GROUP S.R.L.
0099	2,4 DETEC	2,4 - D SAL AMINA	Plaguicidas	Herbicida	II	CONCENTRADO SOLUBLE	TECNOMYL S.R.L.	Paraguay	30/03/2015	AGROBOLIVIA LTDA
1622	2,4-D AMINEX	2,4 - D	Plaguicidas	Herbicida	II	CONCENTRADO SOLUBLE	NANING CF AGROCHEMICAL CO., LTD.	China	12/11/2014	AGROINDU GROUP S.R.L.
1545	2,4D-AP	2,4 - D	Plaguicidas	Herbicida	II	CONCENTRADO SOLUBLE	NANING CF AGROCHEMICAL CO. LTD.	China	02/07/2014	AP AGRICULTURA PROTEGIDA EMP. COMERCIAL Y DE SERVICIOS S.A.
1162	2-4 DENOVA	2,4 - D AMINA	Plaguicidas	Herbicida	II	CONCENTRADO SOLUBLE	ZHEJIANG YONGNONG CHEM. IND. CO., LTD.	China	12/08/2012	EMPRESA AGROPECUARIA NOVAGRO S.A.

Figure 3.9 National Service of Agricultural Sanitation and Food Safety's National Unit of Vegetable Sanitation registry of forbidden products. Available at: <http://www.senasag.gov.bo/egp/productossv1.html>

Recently, Cuenca et al. (2019), investigated pesticide exposure, use of personal protective equipment and health outcomes through measurement of urinary pesticide metabolites within three farming communities in Bolivia. The two most frequently used pesticides, methamidophos and paraquat, are labelled as highly and moderately dangerous, respectively, by the WHO.

Despite this, only 17% of farmers were well protected according to guidelines by the Food and Agriculture Organization (FAO). Across all communities, fewer women were well protected compared to men. The health effects of pesticide exposure were widespread. Women reported experiencing acute health effects more frequently than men. These symptoms included headaches, burning eyes, red skin and shaking chills. A third of all women stated they sprayed pesticides during pregnancy or breastfeeding and almost half of all women suffered miscarriages with a third delivering a child with a malformation or stillbirth (Cuenca et al. 2019). This study corroborated and expands on previous studies clearly showing that farmers are not following recommendations for proper handling and protection. The need for education and training of farmers to reduce exposure and poor health outcomes is essential.

### **POPs from Waste**

Bolivia has a large challenge with waste management from industrial, mining, agricultural and household sources. Unintentional POPs – dioxins and furans - from waste burning (and forest wildfires) also present a large problem.

In 2015, the new Law 755 on integrated management of waste was introduced, which stipulated the right to live in a healthy environment. It prioritized the prevention of waste, followed by recycling and, where possible, avoiding landfilling as a final solution. The law also includes extended producer responsibility, meaning that companies should be held responsible for taking back their waste, and that caused by their products. Urgently, Law 755 needs to be broken down in specific sub-laws, action plans and budgets, with specific responsibilities for the local and national government and agencies regarding compliance, enforcement and persecution. Currently, there is little real progress.

The uncontrolled dumping of household waste continues in most parts of the country, even in and around La Paz city. The river is used as a dumping site and is badly contaminated. Still, some progress has been made, with separate waste containers having been introduced across La Paz city. La Paz municipal landfill collapsed in early 2019 and was closed to the scoping team of visitors. As a large part of the country's territory is mountainous with steep slopes, it makes it difficult to find suitable places for waste landfills, and they are at constant risk of landslides. Therefore, a much stronger effort to prevent and reuse waste is necessary.

A large share of the waste (40-50%) is green kitchen and garden waste, which can be entirely prevented from entering the waste stream and recycled for soil improvement and biogas production.<sup>7</sup> At the project's multi-stakeholder workshop, biogas was presented as an option. Plans for biogas production by an Austrian company are ready, but thus far no concrete investments have been made.

In Bolivia, the gender dimensions of waste are very clear, but it lacks data. Traditionally, there are waste pickers that separate waste for re-use. They will gather and separate glass, plastic bottles, paper, cans or cardboard. But they do not collect organic waste. Through several pilot projects, an effort has been made to integrate the traditional waste pickers into a modern waste system. Many waste pickers are women (Sulzer, 2019). So far, pilot projects have not seen lasting success.

Unfortunately, most households, who are not in the city centre and do not have access to waste containers nearby, are burning their waste. Traditionally, families burn their waste at sunset and are unaware that highly toxic emissions can emerge, such as dioxins from the burning of chemical, electronic, and plastic waste.



Photo 3.9 River used for illegal waste dumping. The panel says, "forbidden to dump waste, fine of 500 Bolivianos". Photograph taken by André Magon, Reacción Climática, June 2019.

<sup>7</sup> In: Sulzer, XA (2019) Swisscompact powerpoint, 2019. <https://www.swisscontact.org/en/news/bolivia-new-environmental-protection-project-supports-sustainable-businesses-in-the-transportation-sector>





Photo 3.10 Yard of woman waste scavenger in La Paz. Photo: André Magon, Reacción Climática, June 2019



Photo 3.11 Waste dumped over the edge of the cliff in a neighbourhood of La Paz. Photo: André Magon, Reacción Climática, June 2019.

An inventory by the Bolivian agriculture services Senasag, of obsolete pesticides 7 years ago found 339 obsolete pesticide dumps. Bolivia had 615 tons of obsolete POP pesticides spread over 339 dumps (data from 2013). Ten obsolete pesticide storage places were prioritized for cleaning up and 23 tons were re-packed into safe containers. Unfortunately, this means that a lot of the obsolete POP pesticides still circulate in the informal markets. (SENASAG, 2013).

The problem is that, even if 23 out of 615 tons were contained, each day new obsolete pesticides are sold on the market, so it is an impossible task.

The situation is aggravated by the extension of large-scale agriculture, such as soy production. Unfortunately, 90% of the soy produced in Bolivia is GMO-soy and is grown with the use of glyphosate.<sup>8</sup> With the extremely heavy and long-lasting forest fires of September 2019, where more than 4 million hectares of Bolivian amazon forest were burned, the situation worsens (REF-CARMEN). It is expected that the burned forest will be cleared for industrial agriculture (soy) and cattle raising. Both soy and meat are aimed at the export market, largely to China. The economic model in Bolivia is heavily based on exports of raw materials, extractive and unsustainable agricultural products.

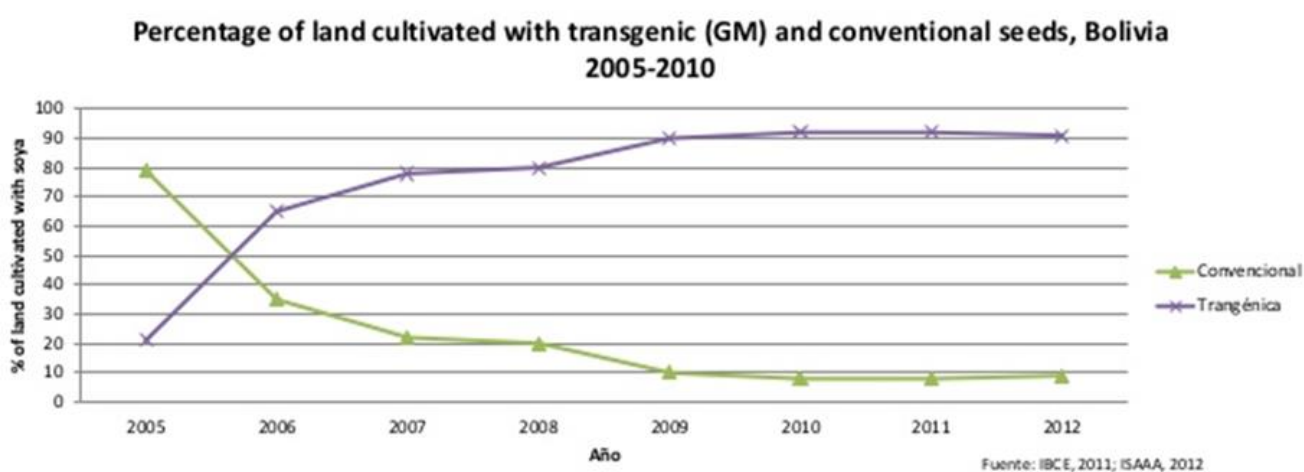


Figure 3.9 Source: Instituto Boliviano de Comercio Exterior<sup>9</sup> <https://ibce.org.bo/>

<sup>8</sup>Available at:

<https://www.lostiempos.com/actualidad/economia/20181127/cada-vez-hay-mas-productos-transgenicos-pero-no-especifican-sus> 2018; [https://www.slideshare.net/jovearey/migration-hiv-and-food-security-a-focus-on-johannesburg-through-a-livelihoods-lens?next\\_slideshow=1](https://www.slideshare.net/jovearey/migration-hiv-and-food-security-a-focus-on-johannesburg-through-a-livelihoods-lens?next_slideshow=1) Ben McKay, ISS Netherlands, May 2014.

<sup>9</sup> In 2012 the IBCE reports 90-92% of Soy grown in Bolivia to be GMO [https://ibce.org.bo/images/publicaciones/ce\\_204\\_produccion\\_soya\\_responsable\\_Bolivia.pdf](https://ibce.org.bo/images/publicaciones/ce_204_produccion_soya_responsable_Bolivia.pdf) and information from the GMO industry lobby group ISAAA <https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=17605>. Note there are no updated figures for recent years available. New GMO Soy products have been approved by the Bolivian government in 2019.

## New POPs

New POPs such as flame retardant Decabromodiphenyl ether (DecaBDE) used for TV casing and car parts are increasing in the waste stream, alongside a growing stream of single-use plastic waste. There is increasing awareness about the problem of electronic waste.

Several initiatives are taking place in the city of La Paz to handle e-waste. Like other low-income countries, Bolivia has become a great consumer of electronics. Several companies and the Municipality of La Paz are joining efforts to find solutions to the problem.

People are encouraged to take old computer screens to 'Reciclatón', a place where the local authorities pick up e-waste and then separate out useful components. Men and women are working at Reciclatón, but no statistics were available at the time.



Photo 3.10 Advertisement for Reciclatón, calling on citizens to bring their e-waste, and their lamps containing mercury, to the collection site on plaza Avaroa.



Photo 3.11 Volunteers of Reciclatón at the collection point, receiving waste from citizens, which then gets picked up by the local authorities and private waste companies to separate out dangerous and useful components. Photo: Reacción Climática 2019.

## Chrysotile Asbestos

Numerous roofs are covered with chrysotile asbestos, but there is no procedure to safely manage asbestos when sold, used or when it becomes waste. In the dump sites along the river Choqueyapu, pieces of asbestos roof (waste) could be seen everywhere by the visiting project experts.

The Rotterdam Convention's technical assessments have proposed that chrysotile asbestos should be listed on the list of prior informed consent (PIC), as there exists no safe level of exposure to asbestos dust, even under better situations than that found in Bolivia. In Bolivia, there is no reliable data on the health impacts of chrysotile asbestos on women, men and children from secondary exposure, nor on the occupational health of workers, but it is very likely that lung cancer and mesothelioma cases occur, due to the abundant uncontrolled asbestos waste in the country.

Hardly any data exists on exposure of Bolivian workers and citizens to asbestos fibres (all types of asbestos including chrysotile). The 2018 analysis by Si Consultores SRL (Magnin, Alejandro, 2018) indicates that between 1965 and 1990 almost all buildings which were built in Bolivia contained some asbestos containing materials. A study from 2012 found air-borne asbestos fibres in the asbestos cement plant based near Cochabamba (The manufacturing facility is located in the eastern end of Cochabamba along Highway 4. Cochabamba,

approximately 250 km southeast of the capital La Paz). The asbestos cement plant uses Bolivian crocidolite asbestos to produce roofing sheets. The asbestos content of the cement varied from some 34% before 1990, to 5% when the plant was studied in 2011.

The 2018 analysis estimates that many of the asbestos containing building material are getting old, fragilized, and are suffering from exposure to the weather, thus risking those asbestos fibres are increasingly leaching from buildings into the environment. The scoping study by Reacción Climática and WECF in addition, found asbestos roofing waste lying alongside roads near rivers and housing areas, another source of exposure of the population to asbestos fibres.

It would be essential to inform workers and citizens on the health risks of all types of asbestos, and of crocidolite asbestos in particular, in order to ensure immediate measures for the safety of workers and citizens working with asbestos, living in buildings containing asbestos and exposed to waste containing asbestos fibres.



Photo 3.12 Asbestos waste, once used for roofing, is not treated with the needed security measures and ends up mixed with other waste in the environment. Photo: Nagon, 2019

## Lithium

The world needs lithium for powering devices, such as our smartphones and laptops, and it will play a vital role in the global shift towards electric cars. The global demand for lithium carbonate – the raw form of the metal – is expected to be about 820,000 metric tonnes by 2025.<sup>10</sup> Lithium is only found in great quantities in a handful of places, with 68% of the

<sup>10</sup> See <https://www.statista.com/statistics/452025/projected-total-demand-for-lithium-globally/>

world's supply concentrated in South America's 'Lithium triangle,' which encompasses Argentina, Bolivia and Chile. The minerals are concentrated in various salt pans along the Atacama Desert and its neighbouring areas (Talens Peiró, L., et al. 2013). If the world plans to move away from oil-based transport and towards hybrid and electric vehicles, lithium supply is a key factor. The Salar de Uyuni in Bolivia holds the largest source of 50% to 70% of the world's known lithium reserves (Sanchez-Lopez 2019).

In January, Germany signed an agreement with Bolivia that would see it extract 40,000 tons of lithium hydroxide a year until 2092. However, now, Bolivia does not have any policy related to the processing of Lithium for other products. Its extraction will be a trade-off with the environment (Dominish, E., et al. 2019).



Figure 3.10. The Lithium triangle in Latin America region. Source: <https://hir.harvard.edu/lithium-triangle/>

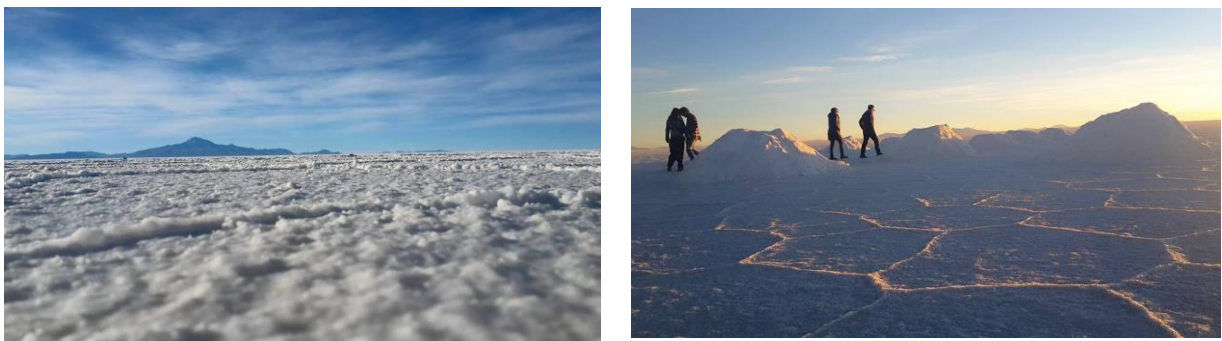


Photo 3.13 Salar de Uyuni, salt deposits that contain lithium. Photo: Carmen Capriles, Reacción Climática, 2017.

# CHAPTER 4

## GOOD PRACTICES IDENTIFIED



## CHAPTER 4

# Good Practices Identified

### From Gold Mining to Fish Farming Through Women's Leadership

The Lecos indigenous community – like the Esse Ejjas – are both nomad tribes who used to travel up and down the lower part of the country. They depend entirely on local food sources. The Esse Ejjas owe no land and depend almost entirely on fish from the river as a source of food. With the increased imports and use of mercury, this source of food is very likely to be dangerous for their health in the long term, particularly for children. Unfortunately, they have no real alternatives except for the slow start of agriculture production.

Lecos, however, owe land and they are permitted to mine on their land. Both men and women work in gold mining. Recently, the women of Lecos are becoming concerned about the health impacts on their families over the use of mercury. They said in the interview that they believe health problems are arising in children, which are reminiscent of Minamata disease, but these children are often abandoned, and there is no information on their prognosis. Lecos women have started an initiative to develop an alternative income other than gold mining. This comes not only out of health concerns, but also due to increased competition in gold mining by international companies, and a reduction of revenue for local communities. Lecos women have started alternative economic activities, such as aquaculture (fish), apiculture (honey) and agriculture (vegetables).

The aim is also to empower the women economically. The municipality is supporting the project with some funding. Fish from the aquaculture are cleaner than the fish from the river and there is enough to serve both as food for the family and income in the market. The honey is also a source of income. The projects have strengthened the position of the women in their community. One of the local leaders is the deputy mayor and plays a vital role in decision-making. She told the interviewers that more training is needed for women on several topics including safe environmental management, avoiding toxins in agriculture and preventing the burning of plastic waste, as this is an area where there is little to no awareness currently. The story of the Lecos women was filmed and presented at the multi-stakeholder workshop in La Paz.



## Biomonitoring of POPs Pesticides

In 2011, research on the residues of organochlorine pesticides in breast milk was carried by Ramiro Avila and Romulo Gemio (Avila, Gemio, 2011). They studied the content of residues of organochlorine pesticides in milk of mothers in gestation and lactation in 112 samples from women of the Hospital "Los Andes", La Paz Bolivia. The study was carried out to determine the concentration of DDT, its isomer o, p'-DDT and its metabolite p, p'-DDE in milk of women residing in the District of Hatillo, belonging to the Central Canton of the province of San José.

The analytical method used was gas chromatography. From studies on breast milk, infants are exposed to concentrations of DDT and its analogues that can be 5 to 50 times higher than those to which adults are exposed. In terms of daily dose, this equates to eight times more than the "maximum acceptable daily intake" recommended by FAO / WHO (0.005 mg/kg/day for adults) as safe.

The study found that DDT and derivatives (ppDDE, opDDE and ppDDT) in the breast milk, was 60,6% higher than that of other pesticide residues, indicating a high exposure to this insecticide, ppDDE was found in all the positive samples. The total DDT, considering the sum of ppDDE, opDDE and ppDDT is greater than the other residues with 60.6% indicating a high exposure to this insecticide. HCB, Lindane and Dieldrin make up the remaining 39.4%, evidencing the variety in the use of organochlorine insecticides.

The population under study, is made up of mothers in the last week of gestation, specifically in labour. Most of them are residents of the city of El Alto or nearby provinces. 55% Percentage of positive samples where organochlorine pesticide residues are detected out of a total of 112 studied at the Maternal and Child Hospital "LOS ANDES".

## Insecticides found in breast milk.

Maternal and Children Hospital "LOS ANDES" El Alto, La Paz, Bolivia	
Dieldrin	7
HCB	29
Lindano	4
ppDDE	45
OpDDE	7
ppDDY	8

Source: Avila, Gemio 2011.

The scoping study by Reacción Climática and WECF, found that these insecticides are still being sold on the market of El Alto. It would be important to continue the breast milk studies in the coming years to monitor the situation and alert policymakers, and citizens, about the danger of the continued use of these harmful insecticides.



Photo 4.1. The insecticide 'Aldrin' being sold on the market of El Alto.  
Photo: Andre Nagon, 2019.

## Women Informal Waste Workers

Women in Bolivia have traditionally been active in informal waste management. Organisations such as Swisscontact and WIEGO are trying to support women waste workers to on the one hand take protective measures against harmful chemicals exposure in their work, and on the other hand, to help them develop more environmentally friendly recycling practices with increased income generation potential.



Photo 4.2 In Bolivia, informal waste collection is an activity in which many women from the communities of the Alto Plano (highlands) participate. Any programme and policy aiming at separate collection of harmful waste, and increasing reuse and recycling, should from the design-phase make sure these women have safety measures against exposure to harmful chemicals, and that they are involved in decision-making to safeguard their livelihoods and reduce the negative impacts of their waste-related activities on their health and that of their families and communities. Photo: Carmen Capriles, Reacción Climática

A good practice of bringing the priorities of women in the waste sector to the attention of policymakers is from the organisation Women in Informal Employment (WIEGO). WIEGO Bolivia describes the situation of women waste pickers in an interview of 2015 with Ms. Neida Clara Tamayo Torrico, from the Red de Recolectores de Santa Cruz, Bolivia (Santa Cruz Waste Pickers' Network). The interview discusses some difficulties facing waste pickers in performing their job and talks about their fight to obtain new legislation that would recognize their work, as well as support from the government in various aspects affecting their lives. Women discrimination in the sector prevails despite some progress made thanks to legislation on the matter.<sup>11</sup>

<sup>11</sup> In: WIEGO, 2015.

<https://www.wiego.org/resources/entrevista-con-neida-clara-tamayo-torrico-english-subtitles>

WIEGO worked with the women in the informal sector of Bolivia to translate their concerns into policy demands, these policies are also relevant for informal waste workers. In 2003, Bolivia passed one of the most progressive policies on domestic workers that exist worldwide.

Importantly, Article 8 of the 2450/2003 Law that Regulates Paid Household Work guarantees the right of domestic workers to health coverage through “affiliation to the National Health Insurance”, but the Supreme Decree to implement the provision was never made. Thus, Bolivian domestic workers have still not been included in the National Health Insurance system yet, and no specific system of health insurance for domestic workers has been created. It was estimated that in 2014 only 5 percent of Bolivian domestic workers had health insurance, according to Prima Oca who was at that time the Executive Secretary of the union of domestic workers ‘Fenatrahob’.<sup>12</sup> Similarly, the 2450/2003 Law recognizes the right to pension coverage, but this right does not cover informal domestic workers, and in 2010, only 10 percent of Bolivian domestic workers had access to the pensions' system (CENAC-Bolivia 2010).

WIEGO continues to work with the domestic workers union in Bolivia to advocate for women informal and domestic workers to obtain health insurance, pensions, minimum salaries and be protected from discrimination and violence (Castaño, 2014; PabloCastaño, WIEGO).

### **Organic Farming and Markets**

The organic farming market in La Paz takes place regularly, and is called ‘EcoTambo’, and allows local organic farmers to directly sell to individuals and the ‘conscience food’ community.

The EcoTambo in experience to empower local producers in ecological and organic production, it has gathered every Saturday for the last 5 years (since March 2015) a number of small producers that are committed to greener production under the highest standards, it aims to grow the consumption of the population of the city of La Paz to have fresh organic goods in order to introduce them to the everyday diet of the paceñan population.

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<sup>12</sup> 60% de domésticas realiza labor múltiple que no es reconocida. In: Zapata, Verónica, 2014. Available at: La Paz, Bolivia, March 28, 2014. <https://www.paginasiete.bo/sociedad/2014/3/29/domesticas-realiza-%20labor-multiple-reconocida-17455.html> Accessed 6 October 2020.

The EcoTambo is a self-managed project that arises from the initiative of consumers in alliance with urban producers and producers of the city of El Alto, producers of rural areas near the city and enterprises with social purposes, with the aim of offering consumers organic and healthy food without intermediaries.

In a country where the consumption of pesticide is overwhelmingly high, the EcoTambo shows that an alternative way of producing is viable and economic and affordable for local consumers. At the same time, it aims to raise awareness about the damage that synthetic pesticides have in our health and that it is possible to acquire organic goods in the city for an affordable price.

Although the initiative was not focused on women, the experience shows that it is mostly women who have engaged on this initiative while shifting from conventional to organic or ecological and that women are the most concerned about their health and identifying that food is important for a healthy life.



Photo 4.3. A vegetable stand at Eco Tambo fair in Plaza Lira in the city of La Paz. The fair is carried on every Saturday to offer organic and ecological production as an alternative to conventional production. Photo: Reacción Climática.



Photo 4.4. The vegetables sold at the Eco Tambo fair include locally grown carrots, radishes, turnips and green onions from organic production. Photo: Reacción Climática.



Photo 4.5. One of the founders of Eco Tambo presenting a basket with a variety of local organic products including herbs, vegetables and fruits. Photo: Reacción Climática.



Photo 4.6. Board members of Eco Tambo celebrating the year anniversary of the fair. Photo: Reacción Climática.

### **E-Waste Recycling following the ‘Swiss Model’**

Jonnathan Butron Claire, environmental auditor and part of a government expert commission on recycling, founded REEcicla in 2012. He recognized a gap in the waste management system where e-waste recycling was non-existent across the whole of Bolivia. The business model involves the exchange of old electronic devices for a small disposal fee that is based on the quantity of recyclable materials within the device. The recyclable parts, such as copper, steel and circuit boards, are then separated and sold. REEcicla also serves to generate awareness in the population, beyond simply doing a good gesture to becoming environmentally aware of pollution and its effects (Sulzer, 2019).

REEcicla is supported by the organisation Swisscontact, which alongside the government, aims to improve waste management and uncover the most efficient and environmentally sound means of dealing with waste. Most critically, Swisscontact helped to implement the ‘extended producer legal responsibility’ or EPR legislation in 2015. Under this policy, producers are given significant responsibility (financial and/or physical) for the treatment or disposal of post-consumer products. EPR, in theory, hopes to provide incentives to

prevent waste at the source, promote product design that is environmentally friendly and support the public in recycling and waste management.

As of 2012, REEicla processed 20 tonnes of e-waste each month and employed between 7 to 15 people from middle to poor class, with hopes of expanding to as much as 70 tonnes per month, and creating more jobs for Bolivians (Sulzer, 2019).

### **Efforts towards a green, circular and sustainable economy**

Reacción Climática is currently supporting research to develop feasible concepts for a transition to a circular and sustainable economy in Bolivia. Research is being undertaken by Analia Ricaldez, at the Technical University of Dresden. The research has not yet been published, but some key points include the following:

- The green economy provides an opportunity to shift the economy of a country like Bolivia towards future-oriented businesses (renewable energy, circular economy, eco-tourism, etc) and welfare and improvement of life quality. At the same time, it is a challenge for countries like Bolivia, as its economy relies for a large part on the extraction of raw material resources for exportation as a major share of its income.
- The circular economy is one of the bases for the green economy, aiming to convert waste into a new resource to be used as a service or a raw material. The circular economy builds on the three main R's (Reuse, Reduce and Recycle). Some countries have established a legal framework and standards for a certain amount of reused material to be inserted into new materials and some have also banned the landfilling of waste, or the incineration of waste that contain hazardous materials.

Not only the conception and design of products has an important role for achieving the goals of circular economy, so does the Waste Management. Whether for a large or small city, waste management represents a big effort in technology and investment for countries such as Bolivia. The generation of waste is related to consuming patterns as well as to the rapid growth of urbanization and the lack of planning.

One of the main obstacles are the collection of potential material from waste, for further use. This requires proper segregation facilitates and knowing the mix of materials and chemicals that are present in the waste product from which new materials are to be made.



The new materials should not be mixed with hazardous substances (i.e., corrosive, toxic, flammable, etc.). With international waste trade happening at a large scale, including waste which contains hazardous chemicals and other substances, a great effort is required from a country like Bolivia to create and implement the policies and legislation that will ensure the safe reuse of waste materials, and the shift away from a highly extractives-oriented economy. The research by Analia Ricaldez observed at best practices from other countries and how to use the global chemicals and waste conventions (Rotterdam, Basel, Stockholm and Minamata conventions) to ensure a shift to a green, circular, and sustainable economy for Bolivia.

# RECOMMENDATIONS



## CHAPTER 5

# Recommendations

### Policies

#### Implement the Bolivian environmental framework legislation

- The Bolivian environmental framework legislation on the rights of Mother Earth, and its Law of the Environment 1333 including the regulation on chemical substances (reglamento de sustancias quimicas) provide the necessary measures to protect Bolivian women and men from environmental pollution and destruction. What is needed, is there full implementation and enforcement, with a gender-responsive approach.
- The Basel, Rotterdam and Stockholm conventions as well as the Minamata convention are ratified by Bolivia, but the National Implementation Plans to ensure continued implementation have not been finalized, this is required.
- Gender-specific measures as part of the implementation of all national environment policies should accompany the environmental laws and regulations.

#### Gender responsive implementation of the chemical conventions

- Develop a gender strategy and action plan for the implementation of the chemical conventions (BRS and Minamata) including activities that focus on women from local and indigenous communities and specific sectors such as the formal and informal waste sector.

#### Support women in transition to safe jobs

- Support women waste workers in a transition to safe and decent work.
- Recognize the importance and value of waste scavengers, who in La Paz are mostly indigenous women from the highlands. They should not be stigmatized, and their work should be positively valued. They should be provided with health and disability insurance, a formal job contract, childcare support, training and protective gear.

### Develop legislation to curb single use plastics and electronic waste and enforce measures

- To protect the health of the population and the (informal) workers in the waste sector, pass legislation to stem the flood of single use plastics and electronics and take measures for extended producer responsibility for take back and sound management of their product waste.
- To reduce the wide-spread custom of burning waste, enforcement of waste regulation combined with an educative campaign on reducing burning of waste by households.

### Take immediate measures to stop the import and use of mercury and support indigenous women in finding an income in something other than gold mining

- More health studies looking at the impact of mercury import, export, use and pollution are needed, especially mercury pollution of fish and other food sources. As many of the indigenous populations are badly nourished, mercury exposure in their main food source can exacerbate other health issues.
- Support indigenous people with access to land, and through women's activities in agriculture, apiculture and aquaculture. They should receive training including awareness raising, their local women's organisation must be supported in addition to supporting the expansion of eco-tourism.

### Have strong policies to end the use of restricted pesticides and support the transition to organic farming

- Have strong policies and programs for the promotion of organic agriculture, including support for women farmers to shift to organic farming. This needs to be accompanied by an awareness raising campaign on health risks, as well as possible fines and bans of produce-containing residues of banned pesticides.
- Hold chemical multinational companies accountable for their banned and restricted pesticides that are still being sold on the market.
- Create a fund to support the further clean-up of the hundreds of remaining obsolete pesticide dumpsites in addition to centres for the disposal of toxic chemicals, including pesticides, by citizens.

## DATA

Improve sex disaggregated human bio-monitoring data:

- Extend sex-disaggregated human bio-monitoring data and gender equality considerations of chemical and waste polluted areas, agricultural areas, mining areas and waste burning areas.
- Monitor gender equality data, including on women's participation at all levels of decision-making in authorities responsible for the proper management of chemicals.

## RESOURCES

- Generate funds for gender responsive implementation of the BRS and Minamata convention by a combination of domestic resource mobilization through measures such as taxes on pollution (e.g. on pesticide use, on plastic waste) and integration of sound waste management in international funding programs including from the green climate fund.
- Support initiatives and information campaigns for and by civil society organisations including women and environmental organisations to support a shift to sustainable consumption patterns, reduction of waste generation, and shift away from agrochemicals towards organic farming.

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