Update on Samarco

April 2017

Source: Samarco
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Geographical context

Source: Renova Foundation
Main impacts

- 18 fatalities and 1 missed
- Around 2,200 hectares impacted along 650 kilometers of the river
- Temporary suspension of water supply in 16 locations
- Impact on public and private infrastructure, including 3 communities to be relocated
- Approximately 300 rural producers impacted. Some of them also had their production capacity impacted
- Around 7,500 fishermen impacted due to a ban of fishing activities
Agreement for remediation and compensation

The agreement with federal and state authorities, and certain other public authorities allows for the coordination and bring more efficiency in applying the remediation measures, complementing the actions already started.

Remediation and compensation program

- Reparation of the environment and of the communities impacted
- Environmental compensation where reparation is not possible, such as:
  - Project for basic sanitation for the regions impacted
  - Reconstruction of Bento Rodrigues and Paracatu de Baixo

Implementation of the agreement

- Creation of the Renova Foundation to manage the socioenvironmental and socio economic programs
- Implementation deadline of 15 years, renewable until all the programs have been implemented
- Establishment of advisory committees with the participation of technical specialists, regulators and representatives of the communities

Basic financial structure

- R$ 4.4 bi in the first three years (2016-2018) to guarantee the progress of the reparation and compensation actions, while the projects are being detailed
- R$ 0.8-1.6 bi per year from 2019 to 2021, the value will be defined based on approved projects
- R$ 240 million per year over 15 years (since the signature of the agreement) for the execution of the compensation projects
- Additional payment of 500 million to fund sanitation initiatives from 2016 to 2018
- In case that Samarco has no resources, Vale and BHP will fund the amounts due
Renova Foundation

The Foundation is a private non-profit entity; the name "Renova“ is aligned with its aim of repairing, restoring and reconstruction the damages caused by the failure of Fundão tailings dam.

• It is responsible for the 41 socioenvironmental and socioeconomics programs established in the agreement and its headquarter is located in Belo Horizonte. It started to act on August 2nd, 2016

• The entity assumed all the reparation activities, which had been undertaken by Samarco and its shareholders

• It is governed by the distinguished President – Roberto Waack (former executive director of WWF Brasil, GRI, Forestry Stewardship Council)

Focus of activity:

• Action aligned with the expectations of communities, academy, NGOs, government and regulatory agents

• Change of the acting focus from emergency to more strategic, aiming more engagement
Governance structure
Socioenvironmental programs – main themes

1. **Social organization** – registration, financial assistance, indemnity, indigenous people, social discussion

2. **Infrastructure** – recovery, reconstruction and resettlement

3. **Education, culture and leisure** – schools, history, tourism, culture and leisure activities

4. **Health** – physical and mental health of the impacted populations

5. **Innovation** – research technologies remediation

6. **Economy** – fish, agriculture, economic diversity, local employment and development of small businesses

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Overview

- **40** municipalities served
- **1,125** people housed in Barra Longa and Ouro Preto/Mariana
- More than **14,000** people already registered
- More than **8,000** families served by financial assistance
- More than **70,000** proposals generated by the indemnity program and more than **40,000** proposals accepted
- Courses for more than **500** residents in civil construction, gastronomy and information technology
- More than **2,100** people trained for the identification of sacred arts
- More than **990** meetings held in the impacted cities
- **1,197** indigenous families in the program
- **8,184** cards for emergency financial help delivered

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Samarco
Main infrastructure works

- **102** refurbished houses
- **34** refurbished businesses areas
- **157,000 m³** material (waste) removed in Barra Longa
- **18** properties fenced
- **64** rural properties refurbished and cleaned
- **2,271 km** paved roads recovered
- **417 km** non-paved roads recovered
- **8** bridges reconstructed
- **95** yards and areas refurbished in Barra Longa
- **2** houses reconstructed in Barra Longa
- **40** simple bridges reconstructed
- **18** stables reconstructed
- **3** soccer field reconstructed

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Samarco
PIM – Mediated Indemnity Program

Indemnity for the interruption of supply and distribution of water

• Accumulated attendance by March 2017: 101,012 beneficiaries served with proposals presented, being 63,023 in Governador Valadares and 37,989 in Colatina;

• Accumulated accepted proposals by March 2017: 67,955 beneficiaries, being 46,931 in Governador Valadares and 21,024 in Colatina;

• Beneficiaries with credited card in March 2017: 30,721 beneficiaries, being 18,760 beneficiaries in Governador Valadares and 11,961 in Colatina.

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Districts’ reconstruction

**Bento Rodrigues**
- Approval by the neighborhood committee of the final version of the urbanistic conceptual plan on March 29, 2017.

**Paracatu de Baixo**
- Presentation of the urbanistic project proposal to the neighborhood committee and technical advisory on March 28, 2017, with the addition of new farmers.
- Under analysis and consideration by the committee and technical advisory.
- Draft contracts of purchase and sale of land of the first 4 owners delivered, awaiting the response for completion.

**Gesteira**
- Another area is under analysis, to be presented to the local community, which signaled a preference for compensation or individual resettlement or new area.

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Health program

- Social and psychological support were provided for the impacted people
- 76 health professionals were hired by Renova to act in Mariana and Barra Longa
- Maintenance service for ambulance was hired in Barra Longa
- Medicines and materials were provided to Barra Longa
- An UPA (Prompt service unit) was opened in Barra Longa, supported by Renova Foundation
- A temporary basic health unit was refurbished in Paracatu and Bento Rodrigues
- Two health consultants are preparing a diagnostic on health needs in Barra Longa in order to bear a long term strategy for the provision of health services, and consequently, reduce the dependence of the support provided by Renova foundation

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Education program

• A school in Gesteira was totally reconstructed

• Schools in Paracatu, Bento Rodrigues and Barra Longa received support to resume their regular activities

• In Bento Rodrigues it is expected for May 2017 a new scholar space, refurbished and adapted by the Renova foundation, which also make available school transport

• Teachers and students continue to receive social and psychological support

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Source: Renova Foundation
Indigenous people: Krenak indigenous land

- **396** indigenous people currently live at Krenak indigenous land
- For the Krenak, the Rio Doce river (Uatu) has a cultural and religious value
- **126** families received financial aid, since November 2015, in an equivalent amount of **9 minimum salaries**
- **10 km of fences** were installed by the Rio Doce river and **11 km of roads** were repaired
Indigenous people: Krenak indigenous land

- Due to the restriction of the use of water from the Rio Doce river, since November 2015 it has been carried a **daily water distribution**, of mineral, untreated and clean water (volumes below), to fulfill the consumption needs of human and livestock:
  
  - **3,000** litres of mineral water
  - **5,000** litres of untreated water
  - **1,000** litres of drinking water

- It was delivered 2 boats in order to allow people to cross the river, guaranteeing mobility

- It was distributed **140 water containers and 15 water fountains** to provide water for animals

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Indigenous people: Comboios and Tupiniquim indigenous land

Indigenous land of Comboios – 510 Tupiniquim

- **156 families** received, per month, an emergency financial support of 2.5 minimum wages + 20% per dependent. The first repayment was in 2016, but it was backdated to 2015

Indigenous land of Tupiniquim-Guarani and Caieiras Velhas II – **2,595 Tupiniquim and 390 Guarani**

- **915 families** received, per month, an emergency financial support of R$ 732.00. The first repayment was in 2016, but it was backdated to 2015

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation and Comtexto
Socioenvironmental programs – main themes

1. Tailings Management, Recovery and Improvement of Water Quality

2. Reforestation and Water Production

3. Biodiversity conservation

4. Water Security and water Quality

5. Education, Communication and Information

6. Preservation and Environmental Safety

7. Management and Sustainable Use of Water

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Recovery of tailings dams – contention of sediments

The structures are monitored by instruments which detect movements, such as inclinometer and radars. Visual inspections are made regularly.

- Dikes S3 and S4 – concluded
- Santarém dam – embankment completed
- Nova Santarém – Heightening up to 770 quota. To be concluded after the raining season.
- Dike Eixo 1 – Protection structures concluded

**Safety remaining structures - FS > 1.5**

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.
Sela and Tulipa dykes

Safety factor: (Sep 16) Sela 1.55 & Tulipa 1.59 and (Feb 17): Sela 1.57 & Tulipa 1.63
Safety factors values are in accordance with monthly reports of BVP

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.
Source: Samarco
Selinha dyke

Works to increase the safety factor of the structure

Safety factor (Nov 15): 1.22

Safety factor (Feb 17): 1.63

Safety factor values are in accordance with monthly reports of BVP

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Samarco
Nova Santarém dam

Santarém dam damaged by the incident.

Works were made to reestablish the safety factor and increase the storage capacity

Safety factor (Nov 15): 1.37

Safety factor (Nov 16): 2.82

Safety factor values are in accordance with monthly reports of BVP

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Samarco
New structures for contention of sediments

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.
Source: Samarco (Figure out of scale. Simple simulation of the levels of flooding)
Recovery of degraded areas – accumulated advances

- Approximately 74% of physical advance in the environmental recovery services of priority areas
- 74 tributaries with recovery activities initiated (of a total of 101) and execution of approximately 69% of the reconfiguration works of the gutter and erosion control of the priority areas

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Recovery steps of the impacted areas
Recovery steps of the impacted areas

- Water stream
- Impacted areas
- Reshaping and erosion control
- Recovery of access routes
Recovery steps of the impacted areas

- Restoration of riparian forest
- Revegetation of exposed soil
Recovery of the tributaries

After the incident

Reconfiguration and stabilization

Revegetation

Typical example of the recovery of the tributaries of the Gualaxo do Norte and Do Carmo rivers

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Recovery of Gualaxo channel of Norte river

Reconfiguration, stabilization and revegetation

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Source: Renova Foundation
Recovery of sources

Typical example

511 sources already protected, out of 5,000 sources to be recovered over 10 years, with a target of 500 sources per year

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Source: Renova Foundation
Water supply and quality

Iron ore tailings are considered non-reactive and non-toxic

1.23 billion litres of clean water distributed

24 km of pipe were delivered for water treatment stations

26 deep water wells drilled as an alternative water supply

Note: all the programs and their ramifications are subject to CIF’s approval, according to the framework agreement and, when applicable, subject to the competent authorities.

Source: Renova Foundation
Water supply

Delivery of the water mains of Pancas river, located in Norte de Colatina (ES) region

Pumping system of Linhares (ES) water mains

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Source: Renova Foundation
Water supply

Nova ETA in Cachoeira Escura district in Belo Oriente (MG) with treatment capacity of 40 litres per second

Water mains of Pancas river contributes for the improvement of the quality of the water supplied in Colatina

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Source: Renova Foundation
Evolution of the water quality

Turbidity of Rio Doce river

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Source: Samarco