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## Brumadinho reparation advances to promote recovery and compensation for social and environmental damage

*About R\$ 20 billion were disbursed. Almost 12,000 people were compensated and reforestation should reach 23 hectares*

Vale continues to fulfill its reparation obligations and support the communities and people affected by the B1 dam failure in Brumadinho. Over these almost three years, in addition to the Integral Reparation Agreement, the company has advanced in individual indemnity agreements, in the environmental recovery process and in actions in the areas of urban infrastructure, health and professional training, among others. Since 2019, around R\$ 20 billion have been disbursed to promote the reparation and compensation of social and environmental damage. This amount considers R\$ 2.6 billion allocated to individual indemnities and the amounts disbursed under the Integral Reparation Agreement, including judicial deposits.

Marcelo Klein, Special Director of Reparation and Development at Vale, reinforces that caring for people remains the main focus of action – and of learning. “Our structuring actions have evolved in all territories. We recognize, however, that dissatisfactions persist, and we seek to learn from them. We remain vigilant to the needs of residents and are committed to our reparation commitments, taking care of those affected, improving local infrastructure, reactivating the economy, restoring nature, valuing tourism and respecting the memory of the victims.”

### Assistance to people

Attention and care for people is a priority focus of Vale's operations in Brumadinho, the region and evacuated territories. The main support mechanism is the Programa Referência da Família, created in 2019 and which has a team of specialized professionals to provide psychosocial assistance to people who seek this type of help. About 93% of eligible families have joined the program so far, which corresponds to approximately 3,300 people served.

The amounts earmarked for medical and psychosocial care and treatment so far were R\$ 85 million. The amount is added to the approximately R\$ 32 million transferred to the City Hall of Brumadinho, through a cooperation agreement, for the expansion of health and psychosocial assistance in the municipality.

In 2021, Vale also expanded the scope of its primary health care program from 11 to 15 municipalities in the region. Ciclo Saúde, as it is known, offered training to 2,011 health professionals, in addition to donating 5,500 pieces of equipment to 143 Basic Health Units. On the management support front, the program is implementing, together with the municipal health departments, the Geographic Information System (GIS) Ciclo Saúde, a planning tool capable of representing, on maps, various information relevant to primary care.

The resource allows the visualization of the performance indicators by the Family Health team and the particularities of the territory previously identified by the teams in workshops.



*Ciclo Saúde donated 5,500 pieces of equipment to 143 Basic Health Units.*

For the resignification of mourning, since 2019, the Semeando Esperança project uses embroidery as a means for women to tell their life trajectories, their experiences and the relationship with the territory where they live. Since then, 73 women have embroidered more than 500 pieces together. In October, part of this collection arrived at Inhotim. For two months, the art museum exhibited 44 mandalas, 16 panels and 18 assorted pieces embroidered by students from the three groups of the project.

From the end of 2019 to September 2021, 144 residents of the Córrego do Feijão, Cantagalo and Parque da Cachoeira neighborhoods, the most affected by the collapse, received professional training in civil construction and gardening. In addition to the learning offered by the Yara Tupynambá Institute, the students chose 232 houses to be renovated by the project and contributed to the planting of 230 gardens.

### **Nearly 12,000 people were compensated**

Almost 12,000 people signed civil and labor indemnity agreements with Vale, which resulted in the payment of more than R\$ 2.6 billion. At least one family member of each employee, Vale's or outsourced, who died in the dam collapse has already entered into an indemnity agreement with the company. This reaffirms Vale's commitment to quickly and definitively indemnify all those who were affected by the dam collapse or by the evacuation of territory.

To manage these funds, all interested parties have at their disposal the Programa de Assistência Integral ao Atingido [Comprehensive Assistance Program for the Affected], which offers psychosocial care and consultancy for the use of the funds, support for the purchase of real estate and the productive resumption of micro-entrepreneurs, small businesses and agricultural activities, with support in the preparation of business plans and training for their implementation. Nearly 4,000 people have already been served by the program. The services offered are free and voluntary.

## **About R\$ 18 billion of the Integral Reparation Agreement was disbursed**

The actions provided for in the Integral Reparation Agreement, signed in February 2021, between the Government of Minas Gerais, the Federal Public Ministry, the State Public Ministry, the Public Defender's Office and Vale are being detailed and implemented. About R\$ 18 billion were disbursed. The amount corresponds to the first installments, adjusted for inflation, of the Urban Mobility, Water Security and Strengthening of the Public Service Program - projects that are funded by the company and managed and executed by the other parties - and also includes the actions in progress under the responsibility of Vale's execution. It also includes the R\$ 4.4 billion earmarked for the implementation of the Income Transfer Program (PTR), managed by the Justice Institutions, without the participation of Vale, and operated by Fundação Getúlio Vargas, a company chosen by the parties for this purpose. The PTR is the definitive solution for the emergency payment made by Vale to those affected by the Brumadinho dam collapse. This total also includes expenses with infrastructure, housing, water distribution, among others, carried out before the agreement and provided for in the document.

The socio-economic projects, one of the pillars of the Agreement whose execution will be the responsibility of Vale in Brumadinho and in 25 municipalities in the Paraopeba river basin, were submitted to popular consultation by the parties, according to the dynamics of the agreement, finalized on November 22, 2021, with more than 10,000 participants. The initiative allowed residents of the affected regions to prioritize the more than 3,000 proposals for improvements sent by mayors and technical advisors. Now, the Justice Institutions analyze and organize the results before sending them for detailing and execution by Vale. At the end of October, Fundação Getúlio Vargas was selected by the committers to audit these projects.

Another delivery in progress is equipment for the Civil Defense to reinforce assistance and risk prevention in 479 municipalities in Minas Gerais. 293 4x4 trucks, 497 notebooks and digital measuring tapes and 2,485 vests have already been delivered. The delivery of 204 pickup trucks and two tanker trucks are also planned for rescue purposes, in addition to the modernization of the classroom and library at the corporation's headquarters.

## **Infrastructure works for the well-being of the communities of Brumadinho**

It is from the dialogue with the communities and the city hall of Brumadinho that the infrastructure works are defined that aim to contribute to the quality of life of the residents and make the reparation of the damage caused by the collapse.

The suggestions of the population of Brumadinho materialized in public facilities, such as the Território-Parque, which is already under construction in Córrego do Feijão. With the purpose of rescuing the bond between the population and the territory and guaranteeing a new dynamic in the economy, which reduces dependence on mining, the project provides spaces for coexistence such as forest, trails, watchtower, school and soccer field. In addition, there will be a Community Market and a Center for Culture and Crafts, where local businesses will operate, which have been receiving advice and funds to become professional. Local management will be carried out by the community itself, which since July 2021 has participated in training workshops for the sustainable management of these spaces. The objective is to make the Território-Parque a tourist destination and combine quality of life with job and income generation. 20% of the works have already been carried out.





*The Território-Parque will renovate the central square and create living spaces such as a forest, trails, watchtower, school and soccer field.*

Also in Córrego do Feijão, the works on the Memorial in honor of the victims had the foundations completed and are now continuing with the implementation of the structures. The Memorial designed by Avabrum will occupy an area of 7,000 m<sup>2</sup> of built area and three themed spaces (Pavilion, Memory Space and Testimony Space), connected by a slit. At the end of the slit, there will be a watchtower overlooking the collapse area. Completion of the works is scheduled for December 2022.

In 2021, Brumadinho also received a set of works that benefited more than 2,000 people, including the construction of two day care centers and a Family Health Unit, the paving and drainage of roads and the renovation of the local Military Police Battalion.

### **Promotion of tourism helps reduce dependence on mining**

Fostering the tourist potential of Brumadinho and the region is a powerful way to diversify its economy, generate employment and income and reduce dependence on mining. Qualifying entrepreneurs, helping them to structure their businesses and, consequently, improving and expanding services and offers is one of the main points of the Project for Strengthening the Competitiveness of the Private Tourism Sector, carried out in partnership with Circuito Veredas. The project also takes place in neighboring Igarapé, Juatuba, Mário Campos and São Joaquim de Bicas and was extended for another two years. With this, the work started in 2020 with 45 local entrepreneurs will be deepened, while another 45 entrepreneurs will have support to improve their businesses. Another initiative is the Language Project, which began in early 2021. Currently, 77 people already working in the tourism sector in Brumadinho are learning English.

Launched in March 2021, the Program for the Promotion of Sustainable Tourism in Brumadinho, developed in partnership with Instituto Rede Terra, has five structuring projects - which include strengthening tourism governance, increasing rural and community-based tourism, diversification of the local tourist offer, the expansion of financing mechanisms in the area and the restructuring of the calendar of tourist events – the Program works directly with the tourist sector in the region. The goal is for Brumadinho to consolidate itself as a destination with a wide range of options, in addition to visiting Inhotim, the largest open-air museum in the world.



In October, unpublished data generated by the Brumadinho Tourist Demand Survey 2021 was released during the Tourism Governance Seminar, which brought together different actors in the municipality's tourism sector. Among the data generated is age group, origin, income, average expenditure and length of stay of the tourist in the municipality, fundamental for a better understanding of the local tourist demand. The information will serve to analyze the contributions and economic impacts of tourism in Brumadinho and, from there, draw up more effective action plans to strengthen the activity in the region. Another important delivery of the program is the Tourist Map of Brumadinho, which presents, for the first time, the main attractions and tourist facilities in the entire municipality.

### **Respecting nature's time, environmental actions continue to advance**

23 hectares of areas directly affected by the collapse and emergency works were reforested, including protected areas such as legal reserves and Permanent Preservation Areas (PPAs), with the planting of approximately 30,000 seedlings of native species in the region. In all, around 297 hectares were impacted, 140 of which are forested.



*23 hectares of areas directly affected by the collapse and emergency works were reforested. For 2022, another 24 hectares are planned.*

Among the techniques used are bioengineering to recover the soil and control erosion, an important step to effectively restore the ecological balance of the region; the rescue of DNA from native trees, in partnership with the Federal University of Viçosa (UFV), which is being used for the first time in the world; in addition to the Sementes project, which aims to recover affected areas using native seeds. All projects are submitted for approval by environmental agencies before the start of environmental recovery activities.

An important indicator of the progress of environmental actions is the recording, by heat and movement cameras, of wild animals scared away by the collapse, such as ocelots, anteaters, pacas, toucans and puma once again transiting the region. Animals are fundamental for the balance of ecosystems and the improvement of recovery processes, since they act as important pollinating agents and seed dispersers.

For environmental recovery to take place, the first step is to remove the tailings. Of the approximately 9 million m<sup>3</sup> that were released from the B1 dam, approximately 50% have already been handled and are being disposed of in the Córrego do Feijão mine pit, as authorized by the competent agencies. Only after the areas have been released by the Minas Gerais Military Fire Brigade (CBMMG) does recovery planning begin, since the search for the missing has been a top priority since the collapse. In addition, projects are submitted for approval by environmental agencies before the start of environmental recovery activities.

For 2022, the forecast is that another 24 hectares of areas will be in the process of recovery, with the planting of approximately 15,000 seedlings of tree species native to the region and implementation of small-sized vegetation cover (herbaceous and shrubs).

### **Animals are treated, returned to their owners, donated to new homes or returned to nature**

Vale maintains seven farms and eight partner facilities for the identification, care and shelter of approximately 2,400 domestic, wild and production animals. The treatment and care of the animals is carried out following sanitary and management protocols recommended by the Regional Council of Veterinary Medicine (CRMV), the Federal Council of Biology (CFBio), the Federal University of Minas Gerais (UFMG) and competent environmental agencies and audited by an independent company designated by the Public Ministry of Minas Gerais.

In all, 730 animals were returned to their owners, about 300 in 2021 alone, 371 dogs and cats were adopted and another 270 are still waiting for a new home. You can find them on their website: [www.vale.com/melevapraca](http://www.vale.com/melevapraca).

Another 71 wild animals affected by the collapse, found in construction areas or that were at risk in communities were reintegrated into nature between 2019 and 2021. They were medically treated, sheltered and rehabilitated before returning to their natural environment. The action is part of the Fauna Protection Plan, presented by Vale and approved by the competent public agencies.

### **Monitoring of the Paraopeba River**

There are currently 70 monitoring points and more than 38,000 samples were collected and around 5.6 million results of analysis of water, soil, tailings and sediments were generated. Automatic monitoring is also carried out through 11 telemetric stations, thus allowing hourly remote measurement, with data transmission via satellite, increasing information efficiency.

The water quality of the Paraopeba River is also monitored by the Instituto Mineiro de Gestão das Águas (Igam) and, in order for the whole society to follow the evolution of this monitoring, Vale launched in June 2021, a specific page on the website [vale.com/reparação](http://vale.com/reparação).

### **Water security**

The new water collection system from the Paraopeba River, built by Vale in Brumadinho, has already started pumping water. The activity is being carried out in stages, starting with a volume of 1,000 liters per second until reaching a total volume of 5,000 liters per second, the same flow rate of the currently suspended collection.





*The Pará river pipeline, in Pará de Minas, was delivered in February and officially opened in November.*

Vale has also supported the strengthening of water security for the population of the Metropolitan Region of Belo Horizonte, which collects water from the basins of the Velhas and Paraopeba rivers. To this end, five underground wells have already been reactivated for the municipalities of Vespasiano, Lagoa Santa and São José da Lapa, in addition to the construction of four reservoirs for essential customers in the region, such as the hospitals in Baleia, Risoleta Neves, Belo Horizonte and the Sarah Kubitschek Hospital Facilities. Another completed work is the pipeline that interconnects the distribution systems of the Paraopeba River and the Velhas River basin and enables the transfer of water between them.

### **Technology boosts delivery of animal feed products**

Rural producers from 16 municipalities in the Paraopeba Basin now have one more guarantee of the quality of food for their livestock. Since May 2021, samples of all animal feed distributed by Vale have been tested by a new system, which uses near-infrared spectroscopy (NIRS) technology to ensure that the inputs provide a nutritious alternative for livestock, whether they are cattle, pigs, poultry or horses. So far, more than 130 million kilos of products for animal feed have been delivered to around 260 properties in the region.

### **Socioeconomic strengthening is a priority in evacuated municipalities**

In Barão de Cocais, Macacos (Nova Lima), Antônio Pereira (Ouro Preto) and Itabirito, where families were evacuated due to the increase in the emergency level of the dams, the focus of the last year was to implement actions that promote lasting transformations in the municipalities, while the comprehensive compensation of the families directly affected and the restoration of security are ongoing – advances considered essential for people to return, as far as possible, to their previous living conditions.

While the detailing of the Compensation and Development Plans is done with the participation of the communities, priority works were delivered, equipping the four territories with better infrastructure for education, leisure, sports and health. Among them, we highlight the revitalization of Capelinha de Macacos, an important heritage and tourist attraction in the

district; the construction of the new headquarters of the Rubem da Costa Lima Municipal School, also in Macacos, which doubled the educational institution's service capacity; the renovation of schools and donations of health equipment in Antônio Pereira and Itabirito; works to dredge water courses and the renovation of Praça da Lagoa, in Barão de Cocais.

Another priority is to encourage the creation of new business fronts and the strengthening of existing production chains through training projects, support for entrepreneurship, the circular economy and the development of technologies for welfare, education and rural development, thus contributing to increase the population's family income and diversify the economy. More than 1,200 entrepreneurs were trained directly and indirectly in the evacuated municipalities through Projeto Horizonte, which encourages innovative solutions to the problems faced by residents. Of these, 39 projects are being accelerated and, together, they will receive, jointly, more than R\$ 2.3 million in capital, seeds to start their activities.



*Águia Real Orgânicos is one of 39 projects being accelerated by Projeto Horizonte.*

In Itabirito, businesses that exploit regional potential, mainly in the areas of Culture, Tourism and Agroecology, also receive support to get off the ground. More than 40 people have already been trained by the Territorial Development and Social Transformation Project and 14 entrepreneurs have been selected to receive financial support and individual advice.

In the Barão de Cocais and Santa Bárbara regions, social organizations also received technical assistance and financial resources to promote projects that impact local communities.

### **Non-repetition guarantee: seven upstream dams have already been eliminated**

One of the pillars of Vale's work in the principle of guaranteeing that dam collapses such as Brumadinho will not be repeated is the elimination of all upstream dams in the country, in the shortest possible time, with the safety of people, workers and of the environment. With the elimination of seven structures of this type since 2019, of the 30 mapped,



practically 25% of the company's De-characterization Program has been completed and the forecast is that no dam will be in a critical safety condition (emergency level 3) by 2025, when 67% of the upstream raised structures will already be eliminated.



*The Fernandinho Dam, in Nova Lima (MG), was one of the de-characterized structures.*

At the same time, preventive, corrective and monitoring actions at the dams have been intensified, allowing for increased safety until the preparatory and engineering steps for the de-characterization are completed. The latest update indicates that 90% of dams of this type will be eliminated by 2029 and 100% by 2035. Vale maintains provisions of approximately R\$ 10 billion for the De-characterization Program, according to the financial statements as of September 30, 2021.

The 23 upstream dams that will still be eliminated in the country are located in Minas Gerais. The projects are in progress and are monitored by regulatory bodies, the Public Prosecutor's Office and independent technical audits. It is important to emphasize that each project has its own characteristics and challenges and all are based on safety.

As the interventions can represent increased risks, for dams with the most critical alert level (level 3), Vale built large containment structures to protect the communities that live nearby and enable the works to be carried out more safely. All the company's dams in this situation already have their respective containments completed, being able to retain the tailings in case of need. This is the case of the Sul Superior dam, at the Gongo Soco mine, in Barão de Cocais (MG); from B3/B4, at the Mar Azul mine, in Nova Lima (MG); and the Forquilha III dam, at Fábrica mine, in Itabirito (MG).

In order to carry out the works safely for workers, especially in emergency level 3 dams, Vale has been developing, together with its suppliers, innovative technologies. One of the solutions found is the use of equipment (tractors, excavators and trucks, among others) with remote operation, unprecedented technology in application in dam elimination processes. This means that there is no one inside these machines like in an ordinary earthworks. The machines are operated from the Remote Operations Center, structured by Vale in Belo Horizonte (MG), in a safe environment. The operations to de-characterize the B3/B4 dam are already fully operational in the Center and the next ones to migrate to the facility will be those of the Sul Superior dam, which are already carried out by equipment operated remotely from facilities set up in the mine, outside the risk areas.

The elimination of upstream dams is part of the cultural transformation process that the company has been going through since the Brumadinho collapse. In Brazil, the de-characterization is also one of the main milestones of a new model of dam management by Vale with three lines of defense focused primarily on the safety of structures and people who live nearby. The model is in line with the Global Industry Standard for Tailings Management (GISTM), which establishes requirements for the safe management of tailings disposal facilities and aims to avoid any harm to people and the environment. Vale, as a member of the International Council on Mining and Metals (ICMM), has made a public commitment to be 100% compliant with the 77 GISTM requirements in all its tailings disposal facilities by 2025.

All of Vale's mining dams are monitored 24 hours a day, seven days a week by the Geotechnical Monitoring Center (CMG) and undergo regular inspections by internal and external teams. Vale remains committed to complying with the best international engineering practices, always focusing on the safety of workers and communities neighboring the structure.

The Decharacterization Program schedule and other information on Vale's dam management are available and permanently updated at [www.vale.com/esg](http://www.vale.com/esg).

For more information on Reparation actions, access the Balance Sheet, available at [www.vale.com/reparacao](http://www.vale.com/reparacao)

#### More information

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