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Semi-plenary #2**MARIANA AND BRUMADINHO: REPERCUSSION OF MINING DISASTERS ON ENVIRONMENTAL HEALTH**Mário Parreiras de Faria¹

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On 5 November 2015, the Fundão tailings dam in Mariana, Minas Gerais, Brazil, belonging to Samarco Mineração S.A., failed. The dam failure led to the release of about 45 million m³ of tailings (about 90 million tons) in a wave almost 10-meter high, which destroyed the environment and killed 14 workers (13 outsourced and one Samarco employee) and five residents (three adults and two children) of the Bento Rodrigues subdistrict, about 5 km downstream. The destruction of the Doce River basin, up to the state of Espírito Santo, resulted in the loss of 10,000 jobs. Thousands of farmers and fishermen were left without jobs and income¹.

The tailings — which spread across the Coreg do Fundão valley and travelled 600 km along the Doce River and its tributaries — arrived two weeks later in the river mouth in Linhares county, Espírito Santo. About 1,600 hectares of vegetation were affected. The tailings, which increased the turbidity of the Doce River basin rivers, killed thousands of fish and other animals.

About 200 buildings in the Bento Rodrigues subdistrict were buried, and more than 600 families lost their homes. The water supply to towns fed by local rivers, such as Governador Valadares, with about 276,000 residents, had to be temporarily cut for several days. Losses in infrastructure alone in Mariana were of about BRL 100,000,000, according to the municipal government¹.

In addition to immediate impacts, such as interruption of the potable water supply to communities on the Gualaxo and Doce Rivers margins, the incidence of diarrhea and dengue increased in the affected area.

Analysis of suspended sediment along the Doce River basin evidenced high levels of mercury, arsenic, nickel and lead. The iron, arsenic, mercury and manganese levels surpassed the limits established in water quality guidelines².

The unemployment rate increased 30% in the historical town of Mariana. Also the incidence of alcohol and illegal drug consumption, depression, domestic violence and suicide increased. Barra Longa was seriously hit by the tailings, resulting in significant amounts of dusts, which increased the rate of respiratory and skin problems, especially among children and older adults.

Three years later, the state of Minas Gerais was again seriously hit by the failure of Vale S.A.'s Coreg do Feijão mine dam, in Brumadinho, 60 km away from Belo Horizonte. This time about 12 million m³ of tailings were released. The tailings hit buildings 1 km downstream and entirely buried administrative offices, the company's restaurant, locker rooms, warehouse, train loading area and part of the ore treatment facilities. It resulted in 217 confirmed deaths and 91 missing people.

The tailings destroyed part of the Coreg do Feijão district, an inn (killing all the people inside), a railway viaduct and several rural properties. The tailings arrived in the Paraopeba River, travelling more than 100 km, and interfered with the water supply to native and quilombo communities, Brumadinho and Para de Minas — since the water supply from the Paraopeba River was cut. Several rural properties on the margins of the Coreg do Feijão and Paraopeba River were hit. Abnormal changes in the water turbidity and metal content still occur and have been a constant source of concern to the authorities. Also the health of the military firefighters involved in body recovery is a source of concern.

The regional economy was seriously affected; the Brumadinho municipality lost about 60% of its income, trade and the tourism industry were severely impaired. The regional socioeconomic and environmental impacts of the disaster are still being measured. Also mining operations in Minas Gerais were gravely affected; operations were suspended in several mines, with substantial impacts across the entire production chain. These phenomena increase the risk of adverse effects on the physical and mental health of the affected population, which thus need to be followed up over time.

These are cases of major work accidents, since they were originated in mining work. In addition to the deaths of workers, these accidents crossed the company boundaries, killing surrounding residents, besides causing incalculable material losses. Its consequences for human life, the physical and mental health of the affected population and the environment extend in space and time³.

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