

W0. Introduction

W0.1

(W0.1) Give a general description of and introduction to your organization.

Vale S.A. is one of the largest metals and mining companies in the world, based on market capitalization. We are one of the leading mining companies in the global market for iron ore, iron ore pellets and nickel, with operations in more than 20 countries and five continents. The company is headquartered in Rio de Janeiro, Brazil, and has 186.2 thousand employees (74.3 thousand own and 111.9 thousand third parties), 80.07% of which are allocated in Brazil.

We also produce iron ore pellets, manganese ore, ferroalloys, metallurgical and thermal coal, copper, platinum group metals (PGMs), gold, silver and cobalt. We are presently engaged in greenfield mineral exploration in five countries.

In addition, we operate large logistics systems in Brazil and other regions of the world, including railroads, maritime terminals and ports, which are integrated with our mining operations. We have a distribution center to support the delivery of iron ore worldwide, directly and through affiliates and joint ventures. We also have investments in energy and steel businesses.

Vale is a publicly traded private organization. The body responsible for guiding and directing the organization's management is the Board of Directors. It is up to our Board to be the link between shareholders and leaders, to define Vale's general policies and guidelines, to evaluate plans and projects proposed by the Executive Committee and to measure the results achieved. For more information, see the Governance section on the Vale ESG Portal: <http://www.vale.com/esg/pt/Paginas/Home.aspx>.

Vale's purpose is to transform natural resources into prosperity and sustainable development. Vale is committed to becoming a sustainability benchmark through a comprehensive approach based on systematic planning and execution, prioritizing risk and impact management (seeking to achieve zero harm to our employees and surrounding communities) and establishing a positive social, economic and environmental legacy in the places where we operate.

In 2018, Vale established the 2030 Water Goal to reduce the specific use of water by 10% (base year 2017). By 2020, it had achieved an 8.7% reduction. This goal is part of our 2030 Structural Plan for Water Resources. Its pillars are: Governance; Technical knowledge; Water risk management; and Strategy for responsible water resource management.

As its main objective is to reduce withdraw for use in production processes, Vale invests in reuse initiatives, the search for new technologies, the development of studies, and the expansion of the monitoring network, which means a smaller volume of new water captured for the same volume of production.

In 2020, we developed our Water and Water Resources Policy that establishes risk management and impact prevention processes for the entire production chain. It helps to preserve the volume and quality of surface and groundwater in hydrographic basins and marine areas, continuously improving the sustainable management and responsible use of water resources, and supports water accessibility and sewage processing projects for communities. Vale has also adapted its global internal standard for management of water resources and effluents to the guidelines of the International Council on Mining and Metals ICMM. The company also participates actively, directly or through representative entities, in forums on managing water resources in the hydrographic basins of regions where we operate, mainly in our area of influence, to contribute to discussions on water safety strategies. Vale acknowledges that there is still room for improvement in effluent management. The company committed to set a target in 2021 to improve effluent management public reporting, in line with our commitment to eliminate the main ESG gaps by 2030.

In 2020, Vale maintained our 2019 water reuse rate of 80%. The company understands that its management strategy is the way to reduce water withdrawal from the environment.

Vale created the Water Resources Forum that integrates operational unit teams to conduct technical discussions on how to manage water resources and effluents in a standardized way. Teams present problems, propose solutions, discuss goals, and define and monitor the respective action plans.

Despite the immense challenges brought on by the COVID-19 pandemic, throughout 2020, Vale maintained its commitments to Brumadinho and the region, adapted procedures to ensure the health and safety of all involved and remained committed to repairing those affected and the communities. In February 2021, we took an important step towards the commitment to the full reparation of Brumadinho. We entered into a BRL 37.7 billion (wich corresponds to USD 7.3 billion) Global Agreement, which includes reparatory and compensatory projects. They involve river sediment containment and removal, water quality monitoring, and fauna and flora preservation.

Read more: http://www.vale.com/brasil/EN/aboutvale/reports/atualizacoes_brumadinho/Pages/default.aspx

W-MM0.1a

(W-MM0.1a) Which activities in the metals and mining sector does your organization engage in?

Activity	Details of activity
Mining	Copper Iron ore Nickel Other non-ferrous metal mining Other mining, please specify (Manganese ore)
Processing	Copper Gold Platinum group metals Silver Nickel Other ferrous metals processing, please specify (Manganese Ferroalloys) Other non-ferrous materials processing, please specify (Cobalt)

W0.2

(W0.2) State the start and end date of the year for which you are reporting data.

	Start date	End date
Reporting year	January 1 2020	December 31 2020

W0.3

(W0.3) Select the countries/areas for which you will be supplying data.

Brazil
Canada
China
Indonesia
Japan
Malaysia
Mozambique
New Caledonia
Oman
Paraguay
United Kingdom of Great Britain and Northern Ireland

W0.4

(W0.4) Select the currency used for all financial information disclosed throughout your response.

USD

W0.5

(W0.5) Select the option that best describes the reporting boundary for companies, entities, or groups for which water impacts on your business are being reported.

Companies, entities or groups over which operational control is exercised

W0.6

(W0.6) Within this boundary, are there any geographies, facilities, water aspects, or other exclusions from your disclosure?

No

W1. Current state

W1.1

(W1.1) Rate the importance (current and future) of water quality and water quantity to the success of your business.

	Direct use importance rating	Indirect use importance rating	Please explain
Sufficient amounts of good quality freshwater available for use	Vital	Important	Water quality and quantity conservation is vital to achieve one of our five strategic plan pillars: embedding sustainability into the businesses. As a mineral resources company, water for our direct use is critical to our operations. We are also a large consumer of energy supplies, thus sufficient amounts of fresh water are also important for providing electricity to a large extent hydroelectric base for our operations. Furthermore, our indirect operations also depend on good quality fresh water. Due to the fact that our operations represent the first step of the mineral industry value chain, and we expect the production processes of our clients to remain the same, as we largely retain the same customers and their locations do not change, an insufficient supply of good quality freshwater would pose a risk to our business continuity. Many of our suppliers' products also depend on good quality water in their production (for example, steel). And we also ensure the health and well-being of our employees and surrounding local communities, who use freshwater for consumption and sanitation. Furthermore, the failure of an efficient water-related management may impact our business with environmental fines. Vale's environmental global goals which prioritize water resources issues proves that future dependency on freshwater in direct operations tends to reduce as we implement our Target Water Program, as its main objective is to reduce withdraw for use in production processes. To this end, Vale invests in reuse initiatives: the search for new technologies, the development of studies, and the expansion of the monitoring network. Future dependency on freshwater in direct operations will reduce as we implement initiatives to meet our 2030 freshwater reduction targets. With predicted global water shortfall of 40% by 2030, exacerbated by the impacts of climate change, it is anticipated that organizations in our value chain will reduce their dependency on freshwater too.
Sufficient amounts of recycled, brackish and/or produced water available for use	Important	Important	The reuse of process water supports Vale to meet our yearly consumption targets. Sufficient amount of reused and brackish water is essential to keep the business running and reduce fresh water abstraction while expanding our operations. Water reuse is part of Vale's production cycle and this alternative is assessed since the first step of the conceptual design of our projects. In 2020, Vale maintained its water reuse rate at the 2019 levels: 80 %. In its management strategy, Vale states that this is a way to collect less water from the environment. In the short term, water reused and brackish along our value chain helps safeguard water security. The company's dependence on water will continue to be important, since it is one of the main inputs, even though it has evolved to reduce consumption. In other words, all the water used in the production processes will continue to be essential and we intend to increase the use of reused water. Considering that water dependency will not change in the future, Vale invests in reuse initiatives; the search for new technologies, the development of studies, and the expansion of the monitoring network through the Target Water Program. Lower quality water can be used in many of our processing operations (from dust suppression to ore processing) and reduces our need for potable water. Thus, recycling and process water initiatives are vital to water security at our operations. Increased water conservation and demand management and use of third-party grey water as opposed to fresh or potable water use is key to our strategy. This kind of water is also important for Vale's main customers, which are the steel industries. Most of the water used in the plants is used in cooling systems, and depending on local availability, brackish water is used in these systems without compromising the quality of the process. The steel industry has high levels of recirculation, showing the importance of the recycled, brackish and/or produced water.

W1.2

(W1.2) Across all your operations, what proportion of the following water aspects are regularly measured and monitored?

	% of sites/facilities/operations	Please explain
Water withdrawals – total volumes	100%	Vale's water withdrawals volumes are monitored through: flow meters, hour meters and water level gauges or the adoption of criteria to register these volumes. Water withdrawal volumes is sourced from GRI performance indicators, consolidated in a monthly basis, and including operational units over which operational control is exercised. The data is also reported at Vale's Integrated Report, audited by Bureau Veritas, according to ISAE 3000, including the adherence to GRI Standards. Vale's Water and Wastewater Management Program guides water withdrawals, starting from the legal needs to obtain specific licenses or permits for water use rights (groundwater/surface water abstraction), passing by measuring, monitoring, use and discharge. According to the Program, each unit should establish its Monitoring Plan, considering: parameter definition and sampling frequency, identify and consider the legal requirements applicable to monitoring and data monitoring methodology.
Water withdrawals – volumes by source	100%	100% of Vale's water withdrawals volumes are monitored through instruments such as flow meters, hour meters and water level gauges or via the adoption of criteria to register these volumes. The information reported for water withdrawal volumes is sourced from our GRI performance indicators, consolidated in a monthly basis, and including operational units over which operational control is exercised. The data is also reported at Vale's Integrated Report. The withdrawal volume by source is monitored monthly with the help of CRedit360, a software used for sustainability indicators management. CRedit360 is monitored by a corporate team of experts.
Entrained water associated with your metals & mining sector activities - total volumes [only metals and mining sector]	100%	This volume, in mining, is basically the water that is trapped in the tailings. We currently calculate this volume per project. We currently define an estimated value on this volume retained in the tailings. The volume of entrained water is strongly dependent on the placement densities, data generally provided by process engineers, and vary according to the merchandise. 100% of our operations are accurately, however not yet 100% measured, a smaller part is still estimated, based on indirect calculations, which, therefore, may have errors greater than 5%. The value of this aspect of water is obtained at the beginning of the project, checking the percentage and density of the tailing's solids. Although the factor is only calculated at the beginning of the project, there is an indirect calculation based on the amount of waste that is sent to the dam, which is done monthly.
Produced water associated with your oil & gas sector activities - total volumes [only oil and gas sector]	<Not Applicable>	<Not Applicable>
Water withdrawals quality	100%	Vale is obliged by local laws to check the quality of the water in order to be able to withdraw it. Subsequently this monitoring remains at least monthly in our laboratories which the common analytical methods used for analysis of trace metals include atomic absorption spectroscopy (AAS), inductively coupled plasma optical emission spectrometry (ICP-OES) and coupled plasma mass spectrometry inductively (ICP-MS). Vale's Water and Wastewater Management Program has a strong appeal for water withdrawals quality. The Monitoring Plan provides information about the Quality Program that includes, sample collection and preservation methodology, analytical and sample extraction methodology, the documentation of traceability of sample of the inventory catalog and warranty documentation. In 2020, Vale also introduced the following water resources management actions: Developed a continuous online water quality monitoring system (metals); Developed equipment to continuously monitor water quality.
Water discharges – total volumes	100%	Vale's Environmental Management System includes the monitoring of total water discharges as well as its destination. The information reported for water discharges volumes by destination is sourced from our GRI performance indicators, consolidated in a monthly basis, and including operational units over which operational control is exercised. The data is also reported at Vale's Integrated Report. In 2020, the report was audited by Bureau Veritas, according to ISAE 3000, and the scope included the adherence to GRI Standards. Vale's Water and Wastewater Management Program guides water discharges through the Monitoring Plan, with the help of CRedit360. Samples are collected monthly, sent to the laboratory and evaluated according to the criteria established by organs regulatory agencies. Of the total amount of water discharged, data are collected as follows: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rules - in wide open channels.
Water discharges – volumes by destination	100%	Vale's Environmental Management System includes the monitoring of total water discharges as well as its destination. The information reported for water discharges volumes by destination is sourced from our GRI performance indicators, consolidated in a monthly basis, and including operational units over which operational control is exercised. The data is also reported at Vale's Integrated Report, which was audited in 2020 by Bureau Veritas, according to ISAE 3000, and the scope included the adherence to GRI Standards. The discharge volume by destination is monitored monthly with the help of CRedit360, a software used for sustainability indicators management. Samples are collected monthly, sent to the laboratory and evaluated according to the criteria established by organs regulatory agencies. Of the total amount of water discharged, data are collected as follows: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rules - in wide open channels.

	% of sites/facilities/operations	Please explain
Water discharges – volumes by treatment method	100%	Vale's Environmental Management System includes the monitoring of total water discharges as well as the treatment method received. The information reported for water discharges volumes by destination is sourced from our GRI performance indicators, consolidated in a monthly basis (with the help of CRedit360 sustainability software), and including operational units over which operational control is exercised. The data is reported at Vale's Integrated Report, which was audited by Bureau Veritas. We evaluated the quality of the water discharged according to the High and Low categories of the ICMM, where the High corresponds to the classes 1 and 2 and the Low to the class 3 of the MAC. Samples are sent to the laboratory monthly and evaluated according to the criteria established by organs regulatory agencies. Of the total amount of water discharged, data are collected as follows: Flow meters - pipes; Parshall flumes - in shallow open channels; Water level rules - in wide open channels.
Water discharge quality – by standard effluent parameters	100%	Vale's Environmental Management System (EMS) includes the monitoring of standard effluent parameters. This monitoring remains at least monthly in our laboratories which the common analytical methods used for analysis of trace metals include atomic absorption spectroscopy, inductively coupled plasma optical emission spectrometry and coupled plasma mass spectrometry inductively. The information reported for water discharges quality data is sourced from our GRI performance indicators, consolidated in a monthly basis, including operational units over which operational control is exercised. The data is also reported at Vale's Integrated Report, which was audited in 2020 by Bureau Veritas. Vale's EMS includes the monitoring of standard effluent parameters for 100% of our operations. Also, the Monitoring Plan from each operational unit includes the identification, quantification and characterization of the generated effluents and plans for monitoring the quality and quantity of effluents.
Water discharge quality – temperature	100%	For environmental legislation, this is a standard effluent parameter, measured in the field and in the laboratory, at least once a month.
Water consumption – total volume	100%	Vale considers consumption as the water not returned back to the water environment. It is accounted for as the difference between total water withdrawals and total water or effluent discharge, which are sourced from our GRI performance indicators, reported also at Vale's Integrated Report, which was audited by Bureau Veritas. Water consumption is a key issue for the company, always seeking to reduce the water taken from the environment for our mining operations. Target Water Program was started in 2018 to guide actions aiming to reduce the relative volume (in relation to production) of Vale's water by 2030. The total volume of consumption is monitored monthly with the help of CRedit360, a software used for sustainability indicators management. CRedit360 is monitored by a corporate team of experts. 100% of our operations are accurately, however not yet 100% measured, a smaller part is still estimated, based on indirect calculations, which, therefore, may have errors greater than 5%.
Water recycled/reused	100%	Vale's Environmental Management System includes the monitoring of water recycled or reused. The information reported for water discharges volumes by destination is sourced from our GRI performance indicators, reported also at Vale's Integrated Report, which was audited in 2020 by Bureau Veritas. The water recycled/reused volume is monitored monthly with the help of CRedit360, a software used for sustainability indicators management. CRedit360 is monitored by a corporate team of experts. 100% of our operations are accurately, however not yet 100% measured, a smaller part is still estimated, based on indirect calculations, which, therefore, may have errors greater than 5%. Samples are collected monthly, sent to the laboratory and evaluated according to the criteria established by organs regulatory agencies. About the water recycled/reused, data are collected as follows: 1) Flow meters - pipes; 2) Parshall flumes - in shallow open channels; 3) Water level rulers - in wide open channels.
The provision of fully-functioning, safely managed WASH services to all workers	100%	All of Vale's operations provide WASH services for employees and contractors. We follow standards for social action and principles on business and human rights, which are based on the guidelines of the United Nations Human Rights Council. These services are mandatory by law, through labor laws and Vale follow fully compliant. Regarding the analyzes in these waters is performed monitoring monthly. The monitoring method will vary according to each Vale unit. It is not currently unified. Samples of water are collected and sent to the laboratory periodically in accordance with the legislation. The physical chemical analyzes performed are: color, turbidity, alkalinity, hardness, pH, among others. Vale guarantees that the water that goes to all workers is of good quality and quantity because carry out preventive maintenance all water supply equipment.

W1.2b

(W1.2b) What are the total volumes of water withdrawn, discharged, and consumed across all your operations, and how do these volumes compare to the previous reporting year?

	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Total withdrawals	144600	About the same	i) Change explanation in value compared from the previous reporting year: In 2020, the total volume of water withdrawal for use in our production processes was 145 million m ³ (rounded value), 3% less than 2019. Vale maintained the water reuse rate at levels of the last few years, at 80%. In its management strategy, Vale understands that this is a way to reduce water collection from the environment. ii) Description of how future volumes may vary: In the future, we expect that more water could be required for production purposes as ore grades decline (e.g. more water required for washing, filtering, etc.) and as haul distances increase (e.g. more water needs to be applied to longer roads for dust suppression, etc.). However, we expect this to be offset by continued improvements in technology and investment in infrastructure resulting in more water being reused and recycled. We also anticipate that future volumes will decrease as we implement reduction measures to meet our 2030 water reduction targets. We will review the water targets in the next reporting year to ensure we balance possible increases in production against water withdrawals, ensuring we improve efficiency and ultimately decrease our water intensity.
Total discharges	29000	Higher	i) Change explanation in value compared from the previous reporting year: The effluents generated in Vale's operating units come from industrial uses and human consumption. These effluents are reused in the company's processes whenever possible and, in 2020, 29 million m ³ were disposed of in the environment, in accordance with the release standards established in local laws. Compared to the previous year, the increase was due to the increased reporting of new operating units. ii) Description of how future volumes may vary: It is not possible to predict whether the future volumes will increase or decrease as discharge volumes in the mining sector are driven primarily by rainfall.
Total consumption	116000	Lower	i) Change explanation in value compared from the previous reporting year: In 2020, the total volume of water withdrawal for use in our production processes was 145 million m ³ , 9% less than 2019. Vale maintained the water reuse rate at levels of the last few years, at 80%. In its management strategy, Vale understands that this is a way to reduce water collection from the environment. ii) Description of how future volumes may vary: It is not possible to predict whether the future consumption volumes will increase or decrease as consumption volumes in the mining sector account for rainfall which is difficult to predict. We are continuously improving our approach and will review our water targets in the next reporting year to ensure we balance possible increases in production against water withdrawals, ensuring we improve efficiency and ultimately decrease our water intensity.

W1.2d

(W1.2d) Indicate whether water is withdrawn from areas with water stress and provide the proportion.

	Withdrawals are from areas with water stress	% withdrawn from areas with water stress	Comparison with previous reporting year	Identification tool	Please explain
Row 1	Yes	1-10	Lower	WRI Aqueduct	i) Explanation of how the WRI Aqueduct was applied to evaluate whether the water has been withdrawn from stressed areas: In the reported percentage we are considering three risk classes, according to the WRI Aqueduct: extremely high (0%), high (1%) and medium-high (2%). In 2020, there was no water withdrawals from extremely high stressed areas. The high stressed areas are from Africa, Asia, and Oceania, while medium-high are from South America according to the WRI Aqueduct. This tool provides global-scale water risk mapping to identify the impacts of river floods due to urban damage, the occurrence of floods and the severity of droughts and the populations affected by these situations. With this tool, it is possible to correlate our operating units' water use with the degree of risk indicated. The accuracy of the databases to generate these global assessments has increased substantially in recent years and is continually improving, however, it is necessary to verify and complement these assessments considering the knowledge and perceptions of local operational water risks, their possible impacts and mitigations' actions. In this sense, in 2020 we started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria. This methodology was applied in 46 operational units considering the following physical risks: floods, conflict over use, supply and droughts. It is noteworthy that an operational unit may be exposed to more than one physical risk and the results of this methodology are presented below, indicating the general result as well as for each of the types of physical risks considered. ii) Explanation of the variation in comparison with previous reporting year: The reduction compared to the previous year was due to efforts related to the water target, where most areas reduced their use/withdrawals, including those in areas of water stress.

W1.2h

(W1.2h) Provide total water withdrawal data by source.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water, including rainwater, water from wetlands, rivers, and lakes	Relevant	102900	About the same	Explanation of why fresh surface water is relevant: It is relevant since it represents approximately 70% of our total water withdrawal. We achieved these results due to improvements in management of water use and/or reuse. Explanation of the variation in comparison with previous reporting year: The fresh surface withdrawal and consequently the dependency on freshwater in Vale's direct operations is reducing each year as the company implement the Target Water Program. Future trends include an increase in withdrawal of non-suitable water for human consumption and a decrease of fresh surface water intake, especially by management initiatives.
Brackish surface water/Seawater	Not relevant	<Not Applicable>	<Not Applicable>	Explanation of why brackish surface water/seawater is not relevant: We did not withdrawal brackish surface water/seawater in 2020. We are studying, in our port operations, alternative sources of collection, namely desalination of sea water or aquifer with brackish water.
Groundwater – renewable	Relevant	35400	Lower	Explanation of why Groundwater - renewable is relevant: Water withdrawal by groundwater (renewable) is relevant since it represents approximately 25% of our total water withdrawal. Explanation of the variation in comparison with previous reporting year: The reduction was due to management initiatives based on Target Water Program. It is anticipated that future volumes will decrease as we implement reduction measures to meet our 2030 water reduction targets. We are continuously improving our approach and will review the water targets in the next reporting year to ensure we balance possible increases in production against water withdrawals, ensuring we improve efficiency and ultimately decrease our water intensity.
Groundwater – non-renewable	Not relevant	<Not Applicable>	<Not Applicable>	Explanation of why groundwater - non-renewable is not relevant: We do not withdrawal groundwater of non-renewable sources. It is anticipated that this approach will not change in the near future, thus reported nonrenewable groundwater will remain the same.
Produced/Entrained water	Not relevant	<Not Applicable>	<Not Applicable>	Explanation of why produced/entrained water is not relevant: We do not use produced water in our operations and we do not intend to use it in the coming years.
Third party sources	Relevant	6300	Lower	Explanation of why third party sources is relevant: It is relevant because some of our operations use, in part or in full, water from concessionaires. Explanation of the variation in comparison with previous reporting year: In 2020, total water withdrawal data by third party source was about 6,300 megaliters, a bit lower than the year before (7,000). The trend is to reduce this value each year with desalination projects, being able to replace part of this water in places near to the sea and installing its own underground water collection wells in a sustainable way.

W1.2i

(W1.2i) Provide total water discharge data by destination.

	Relevance	Volume (megaliters/year)	Comparison with previous reporting year	Please explain
Fresh surface water	Relevant	29000	Higher	Explanation of why fresh surface water is relevant: It is relevant because discharge on mining operations does sometimes occur when there are large rainfall events. Explanation of the variation in comparison with previous reporting year: The volume is much lower than the previous year due to the increased reporting of new operating units. It is not possible to predict whether the future volumes will increase or decrease as discharge volumes in the mining sector are driven primarily by rainfall.
Brackish surface water/seawater	Not relevant	<Not Applicable>	<Not Applicable>	Explanation of why brackish surface water/seawater is not relevant: It is not relevant because we neither discharge any effluents in brackish surface water nor in seawater. And we do not expect to discharge in the close future.
Groundwater	Not relevant	<Not Applicable>	<Not Applicable>	Explanation of why groundwater is not relevant: It is not relevant because we do not discharge any effluents on groundwater. For the future, Vale will invest in research aiming to artificially recharge aquifers and one of the sources may be treated effluents.
Third-party destinations	Not relevant	<Not Applicable>	<Not Applicable>	Explanation of why third-party destinations are not relevant: It is not relevant because we calculate the discharge by third-party destinations together with provision for the population. It is not possible to predict whether the future volumes will increase or decrease as discharge volumes in the mining sector are driven primarily by rainfall.

W1.2j

(W1.2j) Within your direct operations, indicate the highest level(s) to which you treat your discharge.

	Relevance of treatment level to discharge	Volume (megaliters/year)	Comparison of treated volume with previous reporting year	% of your sites/facilities/operations this volume applies to	Please explain
Tertiary treatment	Relevant	24667.12	Higher	11-20	Considering the high and low quality standards adopted by ICMM for disposal, Vale disposed 52% of its effluents in high quality in 2020. High quality: total Dissolved Solids < 5,000mg/l and pH between 4 and 10 and no components, chemical compounds and contaminants in concentration harmful to human health.
Secondary treatment	Relevant	4310.72	About the same	51-60	Considering the high and low quality standards adopted by ICMM for disposal, Vale disposed 48% of its effluents in low quality in 2020, comply with the disposal limits established by local legislation. Low quality is considering disposals with primary and secondary levels of treatment. Low quality: Total Dissolved Solids > 5,000mg/l or pH < 4 or >10 or have components or chemical compounds or contaminants in concentration harmful to human health.
Primary treatment only	Relevant	22.16	About the same	21-30	Considering the high and low quality standards adopted by ICMM for disposal, Vale disposed 48% of its effluents in low quality in 2020, comply with the disposal limits established by local legislation. Low quality is considering disposals with primary and secondary levels of treatment. Low quality: Total Dissolved Solids > 5,000mg/l or pH < 4 or >10 or have components or chemical compounds or contaminants in concentration harmful to human health.
Discharge to the natural environment without treatment	Relevant	0	About the same	100%	Discharge to the natural environment without treatment is considered relevant, as Vale monitors its effluents so that no volume is disposed of in this way.
Discharge to a third party without treatment	Relevant	0	About the same	100%	Discharge to a third party without treatment is considered relevant, as Vale monitors its effluents so that no volume is disposed of in this way.
Other	Not relevant	<Not Applicable>	<Not Applicable>	<Not Applicable>	Vale does not treat water using any specific treatment technique and therefore this item (Others) is considered not relevant.

W-MM1.3

(W-MM1.3) Do you calculate water intensity information for your metals and mining activities?

Yes

W-MM1.3a

(W-MM1.3a) For your top 5 products by revenue, provide the following intensity information associated with your metals and mining activities.

Product	Numerator: Water aspect	Denominator	Comparison with previous reporting year	Please explain
Iron	Freshwater use	Ton of final product	Lower	Explanation of why the volume has changed from the previous reporting year: The volume has changed from the previous year due to our Target Water Program, which started in 2018 and has as its main goal the reduction of water withdrawal in 10% by 2030. By 2020, it had achieved an 8.7% reduction. To achieve these results, Vale invests in reuse initiatives; the search for new technologies, the development of studies, and the expansion of the monitoring network. Vale's main water resources management actions in 2020 related to Governance – Standards and processes was: - Prepared and published the Water and Water Resources Policy; - Adapted the Internal Global Standard for Water Resources and Wastewater Management to ICMM guidelines; - Verified our operational units' adherence in Brazil to the global internal standard for water resource and effluent management; - Instituted the Water Resources Forum; - Managed water risk; - Analyzed water risks and sensitivity to operations; - Practiced responsible management strategy. How the metrics are used internally: We apply these metrics internally to: 1. Verify and monitor the progress of Target Water Program. 2. Evaluate Compliance Risks; 3. Manage water-related performance payments to employees, which are paid in addition to a fixed remuneration. Description of water intensity future anticipated trends: The trend is that this value will continue to decrease, since it is part of the company's water target until 2030. The target is related to the intensity and the metric m ³ /t Mfe. Vale's strategy, since the launch of Meta Água in 2018 (base year 2017), in line with the United Nations SDGs, has reinforced initiatives aimed at governance and the execution of actions operational units.
Iron (pellets)	Freshwater use	Ton of final product	Lower	Explanation of why the volume has changed from the previous reporting year: The volume has changed from the previous year due to our Target Water Program, which started in 2018 and has as its main goal the reduction of water withdrawal in 10% by 2030. By 2020, it had achieved an 8.7% reduction. To achieve these results, Vale invests in reuse initiatives; the search for new technologies, the development of studies, and the expansion of the monitoring network. Vale's main water resources management actions in 2020 related to Governance – Standards and processes was: - Prepared and published the Water and Water Resources Policy; - Adapted the Internal Global Standard for Water Resources and Wastewater Management to ICMM guidelines; - Verified our operational units' adherence in Brazil to the global internal standard for water resource and effluent management; - Instituted the Water Resources Forum; - Managed water risk; - Analyzed water risks and sensitivity to operations; - Practiced responsible management strategy. How the metrics are used internally: We apply these metrics internally to: 1. Verify and monitor the progress of Target Water Program. 2. Evaluate Compliance Risks; 3. Manage water-related performance payments to employees, which are paid in addition to a fixed remuneration. Description of water intensity future anticipated trends: The trend is that this value will continue to decrease, since it is part of the company's water target until 2030. The target is related to the intensity and the metric m ³ /t Mfe. Vale's strategy, since the launch of Meta Água in 2018 (base year 2017), in line with the United Nations SDGs, has reinforced initiatives aimed at governance and the execution of actions operational units.
Copper	Freshwater use	Ton of final product	Lower	Explanation of why the volume has changed from the previous reporting year: The volume has changed from the previous year due to our Target Water Program, which started in 2018 and has as its main goal the reduction of water withdrawal in 10% by 2030. By 2020, it had achieved an 8.7% reduction. To achieve these results, Vale invests in reuse initiatives; the search for new technologies, the development of studies, and the expansion of the monitoring network. Vale's main water resources management actions in 2020 related to Governance – Standards and processes was: - Prepared and published the Water and Water Resources Policy; - Adapted the Internal Global Standard for Water Resources and Wastewater Management to ICMM guidelines; - Verified our operational units' adherence in Brazil to the global internal standard for water resource and effluent management; - Instituted the Water Resources Forum; - Managed water risk; - Analyzed water risks and sensitivity to operations; - Practiced responsible management strategy. How the metrics are used internally: We apply these metrics internally to: 1. Verify and monitor the progress of Target Water Program. 2. Evaluate Compliance Risks; 3. Manage water-related performance payments to employees, which are paid in addition to a fixed remuneration. Description of water intensity future anticipated trends: The trend is that this value will continue to decrease, since it is part of the company's water target until 2030. The target is related to the intensity and the metric m ³ /t Mfe. Vale's strategy, since the launch of Meta Água in 2018 (base year 2017), in line with the United Nations SDGs, has reinforced initiatives aimed at governance and the execution of actions operational units.
Nickel	Freshwater use	Ton of final product	Lower	Explanation of why the volume has changed from the previous reporting year: It was observed that in 2020 there were many maintenance stoppages, taking advantage of the COVID-19 scenario. Such actions directly impact production, which harms the indicator. It is also important to mention that even with the unit stopped, the use of water remains reduced and during the process of returning to operation there is a very high use of water. How the metrics are used internally: The goal achievement in 2020 was linked to variable remuneration. Description of water intensity future anticipated trends: The trend is that this value will decrease, since it is part of the company's water target until 2030. The target is related to the intensity and the metric m ³ /t Mfe. Vale's strategy, since the launch of Meta Água in 2018 (base year 2017), in line with the United Nations SDGs, has reinforced initiatives aimed at governance and the execution of actions operational units.
Coal	Freshwater use	Ton of final product	Lower	Explanation of why the volume has changed from the previous reporting year: The volume has changed from the previous year due to our Target Water Program, which started in 2018 and has as its main goal the reduction of water withdrawal in 10% by 2030. By 2020, it had achieved an 8.7% reduction. To achieve these results, Vale invests in reuse initiatives; the search for new technologies, the development of studies, and the expansion of the monitoring network. Vale's main water resources management actions in 2020 related to Governance – Standards and processes was: - Prepared and published the Water and Water Resources Policy; - Adapted the Internal Global Standard for Water Resources and Wastewater Management to ICMM guidelines; - Verified our operational units' adherence in Brazil to the global internal standard for water resource and effluent management; - Instituted the Water Resources Forum; - Managed water risk; - Analyzed water risks and sensitivity to operations; - Practiced responsible management strategy. How the metrics are used internally: We apply these metrics internally to: 1. Verify and monitor the progress of Target Water Program. 2. Evaluate Compliance Risks; 3. Manage water-related performance payments to employees, which are paid in addition to a fixed remuneration. Description of water intensity future anticipated trends: The trend is that this value will continue to decrease, since it is part of the company's water target until 2030. The target is related to the intensity and the metric m ³ /t Mfe. Vale's strategy, since the launch of Meta Água in 2018 (base year 2017), in line with the United Nations SDGs, has reinforced initiatives aimed at governance and the execution of actions operational units.

W1.4

(W1.4) Do you engage with your value chain on water-related issues?

Yes, our suppliers

W1.4a

(W1.4a) What proportion of suppliers do you request to report on their water use, risks and/or management information and what proportion of your procurement spend does this represent?

Row 1

% of suppliers by number

76-100

% of total procurement spend

76-100

Rationale for this coverage

Vale depends on its supply chain. From railroad tracks to outsourcing, supply management permeates Vale's entire production chain and is strategic to our business. The success of the operations and projects relies on the agility in purchasing materials and services, the correct choices of items, the inventories and the management of HSE variables by our suppliers. Therefore, our suppliers play a fundamental role in the search for best practices towards sustainable development and because of this, these suppliers were selected. Vale selects suppliers considering objective, technical, economic criteria in accordance with the legislation and internal regulations - Supplier Code of Ethics and Conduct, Sustainability Policy, Vale's HSE Guide for Suppliers, anti-corruption guide for suppliers and contractors, Global Human Rights (HR) Policy and Guide for Mobilizing Service Providers. During the supplier's life cycle at Vale there is risk management and documentary and on-site verification. The main stages of this process are: - Certification and Registration: Upon being registered at Vale, all suppliers undergo a risk analysis, which includes assessment on HR issues, HSE and Integrity. In addition, the Company encourages suppliers to implement compliance programs and follow the same guidelines in their production chains. At this stage, a due diligence of contractors is carried out, globally, in 100% of the new registered suppliers. - Selection, Quotation and Contracting: Suppliers commit to expected standards of behavior in accordance with Vale Policies. Vale's standard contract also includes anti-corruption, HSE, and HR clauses. - Management of Contracts and Suppliers: Vale carries out periodic monitoring of suppliers in terms of social, environmental, humanitarian, performance, and government relations. The Supplier Performance Index (IDF) monitors the performance of suppliers at the sites in Brazil and Mozambique based on technical criteria of health and safety, environmental protection, respect for labor rights and continuous improvement through an action plan. It was revised and improved in 2020. By establishing a relationship with its suppliers, related and controlled companies, Vale seeks to share its values and principles, promoting awareness and the practice of HR. The legislation and internal regulations listed above bring together our guidelines, contributing to building quality and long-term relationships that incentivized the suppliers to report.

Impact of the engagement and measures of success

We believe that our performance in health and safety has been evolving every year, in view of the efforts for the prevention of injuries and diseases. Still, there is a way to go to achieve Zero Damage. Vale's service providers are our partners in the search for Zero Damage. Therefore, they must always follow the Health, Safety and Environment Requirements for Vale's contractors. Below are listed the documents and procedures that are requested to our suppliers, which includes water related issues: - Specific HSE guide, mandatorily included in all contracts; - Mandatory inclusion of all HSE obligations and guidelines in the Technical Specifications of each contract according to the specifics of the services; - Supplier mobilization process, mandatory to access Vale's areas, in which HSE training is contemplated; - Periodic assessment of suppliers - IDF in which aspects of HES are considered. Suppliers with underperforming performance must present an action plan and, if they do not meet the requirements, are blocked.

Comment

Vale has an internal Standard for the Environmental Management of Suppliers, which establishes the general environmental directives and criteria to qualify, register, contract, and evaluate the performance of all suppliers. Every 18 months this document is reviewed. Suppliers must implement controls and/or physical barriers to avoid possible impacts on soil and water resources during its activities, such as: supply, washing, cleaning, drainage, maintenance, storage and effluent management.

W1.4b

(W1.4b) Provide details of any other water-related supplier engagement activity.

Type of engagement

Onboarding & compliance

Details of engagement

Inclusion of water stewardship and risk management in supplier selection mechanism

% of suppliers by number

76-100

% of total procurement spend

76-100

Rationale for the coverage of your engagement

Vale depends on its supply chain. From railroad tracks to outsourcing, supply management permeates Vale's entire production chain and is strategic to our business. The success of the operations and projects relies on the agility in purchasing materials and services, the correct choices of items, the inventories and the management of HSE variables by our suppliers. Therefore, our suppliers play a fundamental role in the search for best practices towards sustainable development and because of this, these suppliers were selected. Vale selects suppliers considering objective, technical, economic criteria in accordance with the legislation and internal regulations - Supplier Code of Ethics and Conduct, Sustainability Policy, Vale's HSE Guide for Suppliers, anti-corruption guide for suppliers and contractors, Global Human Rights (HR) Policy and Guide for Mobilizing Service Providers. During the supplier's life cycle at Vale there is risk management and documentary and on-site verification. The main stages of this process are: - Certification and Registration: Upon being registered at Vale, all suppliers undergo a risk analysis, which includes assessment on HR issues, HSE and Integrity. In addition, the Company encourages suppliers to implement compliance programs and follow the same guidelines in their production chains. At this stage, a due diligence of contractors is carried out, globally, in 100% of the new registered suppliers. - Selection, Quotation and Contracting: Suppliers commit to expected standards of behavior in accordance with Vale Policies. Vale's standard contract also includes anti-corruption, HSE, and HR clauses. - Management of Contracts and Suppliers: Vale carries out periodic monitoring of suppliers in terms of social, environmental, humanitarian, performance, and government relations. The Supplier Performance Index (IDF) monitors the performance of suppliers at the sites in Brazil and Mozambique based on technical criteria of health and safety, environmental protection, respect for labor rights and continuous improvement through an action plan. It was revised and improved in 2020. By establishing a relationship with its suppliers, related and controlled companies, Vale seeks to share its values and principles, promoting awareness and the practice of HR. The legislation and internal regulations listed above bring together our guidelines, contributing to building quality and long-term relationships that incentivized the suppliers to report.

Impact of the engagement and measures of success

We believe that our performance in health and safety has been evolving every year, in view of the efforts for the prevention of injuries and diseases. Still, there is a way to go to achieve Zero Damage. Vale's service providers are our partners in the search for Zero Damage. Therefore, they must always follow the Health, Safety and Environment Requirements for Vale's contractors requesting the following documents and procedures, which includes water related issues: - Specific HSE guide, mandatorily included in all contracts; - Mandatory inclusion of all HSE obligations and guidelines in the Technical Specifications of each contract according to the specifics of the services; - Supplier mobilization process, mandatory to access Vale's areas, in which HSE training is contemplated; - Periodic assessment of suppliers - IDF in which aspects of HES are considered. Suppliers with underperforming performance must present an action plan and, if they do not meet the requirements, are blocked.

Comment

W2. Business impacts

W2.1

(W2.1) Has your organization experienced any detrimental water-related impacts?

Yes

W2.1a

(W2.1a) Describe the water-related detrimental impacts experienced by your organization, your response, and the total financial impact.

Country/Area & River basin

Brazil	Rio Doce
--------	----------

Type of impact driver & Primary impact driver

Physical	Rupture of tailings dams and toxic spills
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Primary impact

Fines, penalties or enforcement orders

Description of impact

In November 2015, the Fundao tailings dams owned by Samarco S.A. failed, releasing tailings downstream, flooding certain communities and causing impacts on communities and the environment along the Doce River. The failure resulted in 19 fatalities and caused property and environmental damage to the affected areas. Samarco is a joint venture equally owned by Vale S.A. and BHP Billiton Brasil Ltda. ("BHPB"), a Brazilian subsidiary of BHP Billiton plc. Following the dam failure, governmental authorities ordered the suspension of Samarco's operations. With the exception of the Fundao tailings dam and the Santarem water dam, which was impacted by the overflow of tailings from the Fundao dam, all other production assets owned by Samarco were undamaged. For a discussion of the impact of the failure of Samarco's tailings dam in our financial statements, see Operating and financial review and prospects—Failure of Samarco's tailing dams. In October 2019, Samarco obtained the Corrective Operation License (LOC) relating to its operations in the Germano Complex, located in the Brazilian state of Minas Gerais. With the license, Samarco has now obtained all environmental licenses required to resume its operations. Considering the informations described above, the impact is substantive.

Primary response

Engage with regulators/policymakers

Total financial impact

394000000

Description of response

Samarco and its shareholders, Vale and BHPB Brasil Ltda. ("BHPB"), a Brazilian subsidiary of BHP Billiton plc ("BHP Billiton"), entered into a settlement agreement on March 2, 2016 with governmental authorities, including the federal Attorney General of Brazil and the two Brazilian states affected by the failure (Espírito Santo and Minas Gerais). Under the agreement, Samarco, Vale and BHPB created a foundation (RENOVA - <http://www.fundacaorenova.org/en/>) to develop and implement remediation and compensation programs in substantial amounts over many years. In December 2020, Samarco commenced the gradual resumption of its operations, with the integrated restart of iron ore extraction and beneficiation in the Germano complex, located in Mariana, state of Minas Gerais, and pelletizing at the Ubu Complex, located in Anchieta, state of Espírito Santo. During 2020, the Company recorded an additional provision of US\$26, equivalent to 50% of the estimated costs to carry out the project for the de-characterization of this structure. In 2020, we contributed R\$ 2,904 billion (US\$ 560 million), which was allocated as follows: (i) R\$ 2,059 billion (US\$ 394 million) contributed to Fundação Renova and Samarco to be used in the reparation programs in accordance with the Framework Agreement, and deducted from the provision, and (ii) R\$ 845 million (US\$ 166 million) was used by Samarco to fund its working capital.

Country/Area & River basin

Brazil	Other, please specify (Paraopeba)
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Type of impact driver & Primary impact driver

Physical	Rupture of tailings dams and toxic spills
----------	---

Primary impact

Impact on company assets

Description of impact

In Jan. 2019, the Córrego do Feijão tailings dam failed, releasing approximately 11.7 million m3 of tailings downstream, flooding communities and causing impacts on communities, the environment along the Paraopeba River, and the operational and administrative areas of the mine, where about 600 of our own employees and those of third-party suppliers worked. The failure resulted in 270 fatalities, 11 missing persons and 395 located people (as of the date this response was submitted) and caused property and environmental damage to the affected areas. We suspended some of our operations after the failure. Brazilian courts ordered the freezing of more than US\$4.5 billion of our assets. The impact of the dam rupture in our income statement for the year ended Dec. 31, 2020 was US\$5.26 billion, including US\$3.87 billion in provisions to meet our obligations under the Global Settlement, US\$617 million in provisions to meet our obligations in connection with the decharacterization of our upstream dams, US\$258 million in provisions to ensure geotechnical safety of the remaining structures at the Córrego do Feijão mine and the removal and proper disposal of the tailings of the dam rupture and US\$510 million in expenses with items such as communication services, accommodation and humanitarian assistance, equipment for rescue and remediation efforts, legal services, water, food aid, and taxes, among other items.

Primary response

Engage with regulators/policymakers

Total financial impact

5257000000

Description of response

We concentrate our efforts on long term answers to the impact caused by the failure. We provide about BRL1.3 billion to purchase medicines, water, equipment and other logistical resources as immediate assistance. We also provide water to the affected communities, meals, animal feed, as well as personal hygiene kits, medicines, fuel and construction material. As a response to the failure of the dam, we offered BRL100 thousand to support families who have had deceased or disappeared due to the collapse. In order to take action to repair the damage caused by the rupture of Dam I in a fast and efficient way, on Feb. 20, 2019, we signed a Preliminary Adjustment Agreement, which allowed us to anticipate the payment of emergency compensation for all residents in the city of Brumadinho on the date of the breach, and up to one kilometer from the Paraopeba River gutter, from Brumadinho to the city of Pompéu, at the Retiro Baixo Dam. In Sep. 2020, we announced the Full Reparation Program, for comprehensive reparation of damages caused by the Brumadinho dam rupture. The program results from an open dialogue with authorities and the affected communities, and includes 166 initiatives and projects. The main impacts in our income statement for the year ended Dec. 31, 2020 was US\$5.257 billion, including expenses and provisions to meet our obligations in connection with the decharacterization of our upstream dams and the obligations we assumed in preliminary settlement agreements.

W2.2

(W2.2) In the reporting year, was your organization subject to any fines, enforcement orders, and/or other penalties for water-related regulatory violations?

Yes, fines

W2.2a

(W2.2a) Provide the total number and financial value of all water-related fines.

Row 1

Total number of fines

9

Total value of fines

21008996.21

% of total facilities/operations associated

14.89

Number of fines compared to previous reporting year

Much lower

Comment

In 2020, the company received 9 fines for water-related regulatory violations, which represents a significant reduction (almost 72%) in the number of fines issued in the previous reporting year. The fines issued to the company in 2020 amounts to USD 21,008,996.21 of which USD 10,831,639.61 relates to the rupture of Dam I of the Córrego do Feijão Mine, in Brumadinho, Minas Gerais State, Brazil, and USD 9,622,601.57 refers to the Salobo Copper Project developed by Vale in Marabá, Pará State, Brazil. For further details on these fines, please see question W2.2b.

W2.2b

(W2.2b) Provide details for all significant fines, enforcement orders and/or other penalties for water-related regulatory violations in the reporting year, and your plans for resolving them.

Type of penalty

Fine

Financial impact

10696.16

Country/Area & River basin

Brazil	Other, please specify (Sepetiba Bay and Saco do Engenho Channel)
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Type of incident

Effluent limit exceedances

Description of penalty, incident, regulatory violation, significance, and resolution

Infraction notice on April 20th by the State Environmental Institute (INEA) against Companhia Portuária da Baía de Sepetiba (CPBS), based on art. 87 of State Law No. 3,467/200, for alleged failure to comply with the Operating License's condition, due to the discharge of effluents into the receiving body in disagreement with the standards established in the legislation. On August 7th, CPBS timely presented its defense against the Notice of Infraction. In addition, a detailed assessment of the facts indicated in the Notice of Infraction was carried out and an action plan was submitted to the environmental agency to improve the management of industrial effluents generated at the terminal.

Type of penalty

Fine

Financial impact

43375.85

Country/Area & River basin

Brazil	Other, please specify (Vargem Grande)
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Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

Infraction notice issued on March 3rd against the company, regarding the Vargem Grande complex, based on the alleged conduct: "fail to report an accident with environmental damage to the competent authorities, with a period exceeding 24 hours." There was a failure in the flotation cell's iron ore concentration system, which overflowed and threw material out of the plant, reaching the Lagoa de Codornas. An administrative defense has yet to be considered. It is noteworthy that there is a report in the records that states that no environmental impacts/damages resulting from the accident were found. The administrative infraction attributed to the company is merely due to the absence of a declaration within the deadline.

Type of penalty

Fine

Financial impact

96431.17

Country/Area & River basin

Brazil	Other, please specify (Atlântico Trecho Leste)
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Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

Infraction notice on May 12th against the company, based on the alleged conduct: "fail to report within 2h an accident with environmental damage to the competent authorities and cause intervention in water resources, causing degradation, without authorization from the agency competent". Incident occurred on January 15th, at Mina Cauê, in the Itabira complex. The intervention in the water resource would have been caused by the leakage of the binder, which was carried, the Penha Stream. According to the administrative defense presented, immediate measures were taken to stop the spill, as well as measures for decontamination and correct disposal of waste. Monitoring was also carried out, which indicated that there was no interference in the quality of water and soil. With regard to communication, there is evidence in the records that it was made in less than 2h, which was a mistake in the inspection report. The administrative defense has not yet been assessed by the environmental agency.

Type of penalty

Fine

Financial impact

48215.58

Country/Area & River basin

Brazil	Other, please specify (Vargem Grande)
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Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

Infraction notice issued on June 15th against the company, regarding an incident that occurred at the Capitão do Mato Mine, in the Vargem Grande complex, based on the following conduct: "cause intervention in a water resource, causing degradation, without authorization of the competent body, due to the slippage of the slope due to the intervention of the mining enterprise, whose material was carried away, causing degradation and/or pollution of the watercourse". An administrative defense, not yet judged, was presented, alleging the absence of voluntary conduct, since the landslide occurred because of heavy rains, with rates above normal, which overloaded the drainage system.

Type of penalty

Fine

Financial impact

288678.05

Country/Area & River basin

Brazil	Other, please specify (Sea)
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Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

Notice on Aug.13th by IBAMA against Vale for "causing pollution at levels that could result in the destruction of local marine biodiversity by emitting the oily substance in disagreement with regulatory requirements and by the possibility of perishing species". The warning came after an incident on Feb.2nd , when iron ore transporter MV Stellar Banner-Marshall Islands, which had left Ponta da Madeira Maritime Terminal bound for Qingdao, after identifying 2 cracks in the bow of the hull, undertook to run aground on a shallow bottom about 100 km from São Luís, thus avoiding its sinking, after the vessel was completely emptied on Jun.12th , after the cargo had been collected and authorized by organs competent bodies. On Apr.27,2021, Vale presented a defense, still pending judgment, in which it alleged, its passive illegitimacy to the absence of intent or guilt for the fact that occurred and the absence of a causal link attributing subjective responsibilities in the environmental process.

Type of penalty

Fine

Financial impact

12963.22

Country/Area & River basin

Brazil	Rio Pindare
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Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

Notice on Aug. 4 by the Municipal Environment Department (MED) of Alto Alegre do Pindaré/MA, against Vale, based on an alleged oil spill caused by the overturning of a truck in a body of water belonging to the company CCG. The company was named "co-author for being a service provider". The company opportunely presented a defense to the mayor, in which it was argued that the impossibility of imputing administrative responsibility cannot be imputed, even if in a minor way. There's no specific obligation that has been breached by the company, which hired a company that held a license for that operation. The MED, analyzing Vale's defense, disregarded the technical reports presented by the company as it considered them inadequate for verification and issued an opinion for the maintenance of the infraction notice, but adding a 40% reduction in the fine. Currently, the MED is analyzing the final allegations and the date for judgment be determined by the Environment Council.

Type of penalty

Fine

Financial impact

9622601.57

Country/Area & River basin

Brazil	Other, please specify (Igarapé Salobo)
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Type of incident

Effluent limit exceedances

Description of penalty, incident, regulatory violation, significance, and resolution

Infraction notice issued in September 2020 by IBAMA, based on the following conduct: "disposing liquid waste in disagreement with the requirements established in CONAMA Resolution No. 430/2011 within the Tapirapé Aquiri National Forest Conservation Unit." Administrative defense presented in a timely manner in January 2021. Salobo has been implementing measures to stop or mitigate the impact on the environment, so that the results of the analyzes are within the normative parameters.

Type of penalty

Fine

Financial impact

9643.12

Country/Area & River basin

Brazil	Other, please specify (Paraopeba)
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Type of incident

Other non-compliance with permits, standards, or regulations

Description of penalty, incident, regulatory violation, significance, and resolution

Fine imposed on January 29th due to non-compliance with the obligation to continuously monitor the advance of the plume found in an inspection notice, resulting from the rupture of dam B1 at Fazenda de Córrego do Feijão in Brumadinho. The assessment was based on art. 45 of Decree 47.837/2020 and used code 102 of the Annex, which reads as follows: "fail to comply with or fail to comply with the determination of an accredited agent, for the purpose of monitoring or mitigating damage or danger of damage, which is not subject to infringement specific". The environmental agency is currently analyzing the administrative appeal filed in a timely manner in view of the decision to reject the administrative defense filed by Vale. The company claimed that it did not fail to monitor the compounds that pass through the river, but that there was a dissipation of the plume that had previously existed, resulting in the loss of the object of the obligation in relation to the "plume".

Type of penalty

Fine

Financial impact

10821996.5

Country/Area & River basin

Brazil	Other, please specify (Paraopeba)
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Type of incident

Spillage, leakage or discharge of potential water pollutant

Description of penalty, incident, regulatory violation, significance, and resolution

Fine imposed by the state environmental agency of Minas Gerais due to the death of fish in the Paraopeba River basin due to the transport of materials and the change in water quality due to the rupture of the B1 dam at the Córrego do Feijão Mine, in the municipality of Brumadinho. The assessment was based on art. 112 of Decree 47.383/2018 and used code 443 of Annex IV, which does not conform to the facts described in the infraction: "obstacle or hinder the inspection action of Semad or its related and associated entities". Currently, the environmental agency is analyzing the administrative defense filed in a timely manner by the company. The company is addressing the measures to repair the damages caused as a result of the breach in specific agreements that have the participation of the State of Minas Gerais and other interlocutors.

W3. Procedures

W-MM3.2**(W-MM3.2) By river basin, what number of active and inactive tailings dams are within your control?****Country/Area & River basin**

Brazil	Other, please specify (Atlântico Sudeste)
--------	---

Number of tailings dams in operation

22

Number of inactive tailings dams

3

Comment

Country/Area & River basin

Brazil	Other, please specify (Paraguay)
--------	----------------------------------

Number of tailings dams in operation

1

Number of inactive tailings dams

0

Comment

Country/Area & River basin

Brazil	Sao Francisco
--------	---------------

Number of tailings dams in operation

15

Number of inactive tailings dams

13

Comment

Country/Area & River basin

Brazil	Tocantins
--------	-----------

Number of tailings dams in operation

12

Number of inactive tailings dams

1

Comment

Country/Area & River basin

Canada	Other, please specify (Western Hudson Bay and Mississippi Drainage)
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Number of tailings dams in operation

2

Number of inactive tailings dams

0

Comment

Country/Area & River basin

Canada	Other, please specify (Great Lakes–St Lawrence Drainage)
--------	---

Number of tailings dams in operation

4

Number of inactive tailings dams

7

Comment

Country/Area & River basin

Canada	Other, please specify (Atlantic Drainage)
--------	---

Number of tailings dams in operation

1

Number of inactive tailings dams

0

Comment

Country/Area & River basin

New Caledonia	Other, please specify (South of New Caledonia)
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Number of tailings dams in operation

1

Number of inactive tailings dams

0

Comment

Country/Area & River basin

Brazil	Amazonas
--------	----------

Number of tailings dams in operation

1

Number of inactive tailings dams

0

Comment

Country/Area & River basin

Mozambique	Zambezi
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Number of tailings dams in operation

0

Number of inactive tailings dams

1

Comment

W-MM3.2a

(W-MM3.2a) Do you evaluate and classify the tailings dams under your control according to the consequences of their failure to human health and ecosystems?

Row 1

Evaluation of the consequences of tailings dam failure

Yes, we evaluate the consequences of tailings dam failure

Evaluation/Classification guideline(s)

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dams have been classified as 'hazardous' or 'highly hazardous'

Yes, tailings dams have been classified as 'hazardous' or 'highly hazardous' (or equivalent)

Please explain

Vale's minimum level used to classify a dam as 'dangerous' is: a significant reversible or irreversible environmental impact beyond the occurrence of the incident; Need for extensive repair and control measures, which may require a project; Area protected by law affected; Suspension of environmental license. Vale's internal Planning, Development and Management standard, aims to define the methodology and the main responsibilities in the process of management and prevention of potential risks. It must be revised at least once every 3 years or on demand and submitted for approval by the Executive Committee, who monitors the management of business risks, through the necessary support for the 1st and 2nd lines of defense to act and to ensure that the risks at the level of continuous monitoring have effective controls and action plans, through: mitigation, prevention, transfer, sharing or rejection of risk, for example through temporary or permanent closure of a plant or closure of an activity. At the date of April 2021, Vale had 172 dams in Brazil, of which 148 (including 2 drained piles) in the ferrous minerals business and 24 in basic metals, registered with the National Mining Agency (ANM, acronym in Portuguese). Of this total, 105 dams are subject to the Regular Safety Inspection Report on a semi-annual basis covered by the National Dam Safety Policy, pursuant to Ordinance 70.389/2017.

W-MM3.2b

(W-MM3.2b) Provide details for all dams classified as 'hazardous' or 'highly hazardous'.

Tailings dam name/identifier

Doutor

Country/Area & River basin

Brazil	Other, please specify (Mariana)
--------	---------------------------------

Latitude

-20.290449

Longitude

-43.490528

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

37.68

Planned tailings storage impoundment volume in 5 years (Mm3)

45.85

Please explain

The mine is under Vale's control and is located in the Mariana Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Sul Inferior

Country/Area & River basin

Brazil	Other, please specify (Minas Fechadas - Sudeste)
--------	--

Latitude

-19.975726

Longitude

-43.600697

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

0.6

Planned tailings storage impoundment volume in 5 years (Mm3)

0.6

Please explain

The mine is under Vale's control and is located in the Minas Fechadas - Sudeste Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Sul Superior

Country/Area & River basin

Brazil	Other, please specify (Minas Fechadas - Sudeste)
--------	--

Latitude

-19.970176

Longitude

-43.596867

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

6.02

Planned tailings storage impoundment volume in 5 years (Mm3)

0

Please explain

The mine is under Vale's control and is located in the Minas Fechadas - Sudeste Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

B3/B4

Country/Area & River basin

Brazil	Other, please specify (Paraopeba)
--------	-----------------------------------

Latitude

-20.049122

Longitude

-43.954696

Hazard classification

Highly Hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

2.69

Planned tailings storage impoundment volume in 5 years (Mm3)

2.69

Please explain

The mine is under Vale's control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Forquilha I

Country/Area & River basin

Brazil	Other, please specify (Paraopeba)
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Latitude

-20.406063

Longitude

-43.855737

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

12.76

Planned tailings storage impoundment volume in 5 years (Mm3)

12.76

Please explain

The mine is under Vale's control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Forquilha II

Country/Area & River basin

Brazil	Other, please specify (Paraopeba)
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Latitude

-20.408278

Longitude

-43.851811

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
 Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

22.78

Planned tailings storage impoundment volume in 5 years (Mm3)

22.78

Please explain

The mine is under Vale's control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Forquilha III

Country/Area & River basin

Brazil	Other, please specify (Paraopeba)
--------	-----------------------------------

Latitude

-20.410942

Longitude

-43.83663

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
 Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

19.48

Planned tailings storage impoundment volume in 5 years (Mm3)

19.48

Please explain

The mine is under Vale's control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Grupo

Country/Area & River basin

Brazil	Other, please specify (Paraopeba)
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Latitude

-20.414798

Longitude

-43.865151

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
 Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

1.25

Planned tailings storage impoundment volume in 5 years (Mm3)

1.25

Please explain

The mine is under Vale's control and is located in the Paraopeba Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Capitão do Mato

Country/Area & River basin

Brazil	Other, please specify (Vargem Grande - Pico)
--------	--

Latitude

-20.129913

Longitude

-43.925718

Hazard classification

Highly hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

2.12

Planned tailings storage impoundment volume in 5 years (Mm3)

2.12

Please explain

The mine is under Vale's control and is located in the Vargem Grande - Pico Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Norte/Laranjeiras

Country/Area & River basin

Brazil	Other, please specify (Piracicaba)
--------	------------------------------------

Latitude

-20.176068

Longitude

-43.487317

Hazard classification

Highly Hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

6.17

Planned tailings storage impoundment volume in 5 years (Mm3)

0

Please explain

The mine is under Vale's control and is located in the Brucutu Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

Xingu

Country/Area & River basin

Brazil	Other, please specify (Piracicaba)
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Latitude

-20.176068

Longitude

-43.487317

Hazard classification

Highly Hazardous

Guideline(s) used

Ordinance 70.389/17 - Mining National Agency, Brazil
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

32.31

Planned tailings storage impoundment volume in 5 years (Mm3)

50

Please explain

The mine is under Vale's control and is located in the Mariana Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

M Area Tailings

Country/Area & River basin

Canada	Other, please specify (Great Lakes–St Lawrence Drainage)
--------	--

Latitude

46.471416

Longitude

-81.140583

Hazard classification

Highly Hazardous

Guideline(s) used

Canadian Dam Association (CDA)
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

58.6

Planned tailings storage impoundment volume in 5 years (Mm3)

58.6

Please explain

The mine is under Vale's control and is located in the Copper Cliff Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

P Area Tailings

Country/Area & River basin

Canada	Other, please specify (Great Lakes–St Lawrence Drainage)
--------	--

Latitude

46.471416

Longitude

-81.140583

Hazard classification

Highly Hazardous

Guideline(s) used

Canadian Dam Association (CDA)
Company-specific guidelines

Tailings dam's activity

Inactive

Current tailings storage impoundment volume (Mm3)

59.7

Planned tailings storage impoundment volume in 5 years (Mm3)

59.7

Please explain

The mine is under Vale's control and is located in the Copper Cliff Mine Complex. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

Tailings dam name/identifier

KO2 Berm

Country/Area & River basin

New Caledonia	Other, please specify (South of New Caledonia)
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Latitude
-22.308527

Longitude
166.918416

Hazard classification
Highly Hazardous

Guideline(s) used
Company-specific guidelines
Other, please specify (New Caledonia Decree #2015-526)

Tailings dam's activity
Active

Current tailings storage impoundment volume (Mm3)
22

Planned tailings storage impoundment volume in 5 years (Mm3)
40

Please explain

The mine is under Vale's control and is located in the Deep South plant. The data of planned tailings storage impoundment volume in 5 years is the same of current tailings storage impoundment volume because the dam is inactive and will therefore maintain the volume.

W-MM3.2c

(W-MM3.2c) To manage the potential impacts to human health or water ecosystems associated with the tailings dams in your control, what procedures are in place for all of your dams?

Procedure	Detail of the procedure	Please explain
Assurance program	An assurance program for each phase of the facilities' life that includes the frequency of the various levels of inspections, audits and reviews An assurance program that includes an external audit covering the life of facility or the operating plans	In 2020, Vale prioritized the implementation of the new Tailings & Dams Management System. It also implemented the routine management, performance and risk system (RPR), which covers all strategic aspects of dam safety and tailings deposit; the following management processes are monitored: routine applied to the structure, through operational discipline; performance of the geotechnical asset, made possible by continuous and formal monitoring by the Engineer of Record (EoR); risks, through the identification of failure modes and their critical controls, insertion and monitoring via the business risk management platform. In the routine, are a continuous verification of operational discipline; Basic Guidelines on Geotechnics in which there is: Definition of routine indicators; Periodic evaluation by the geotechnical team; Panels with the main performance indicators presented at operational meetings. The EoR conducts regular safety inspections and issues monthly technical reports, continuously interpreting the results of inspection and monitoring activities on structures, among other duties; is external to operations and is integrated with Vale's lines of defense, in order to act with the authority required for this type of function. The presence of this professional is a good practice recommended by the Mining Association of Canada, the Canadian Dam Association and the Independent Dam Safety Advisory Committee. Vale requires periodic reviews of the dams' physical and hydraulic safety conditions, carried out by external and independent companies. These reviews comply with Brazilian legal requirements and commitments established with Brazilian authorities, such as the Public Prosecutors' Office and the National Mining Agency. The main reviews are: Regular Safety Inspection Report (RISR), audit in compliance with legal requirements and an Independent audit, as per commitments entered into with the Public Prosecutors' Office. Regarding the RISR, it complies with the Federal Government's DNPM Ordinance 70.389/17. The review is carried out twice a year and includes the assessment of the structure's stability condition, with the issuance of the Stability Condition Declaration. Conducted by international companies, these audits meet the demands of the Public Prosecutors, with periodic reporting. When reinforcement works are applicable, a monitoring of the dam stability is carried out by the same auditing company, throughout a year after the completion of the works.
Operating plan	An operating plan that is aligned with your established acceptable risk levels and critical controls framework An operating plan that includes periodic review of the foundations and slope materials	For all of its dams, Vale performs periodic monitoring of safety variables and stability inspections in order to manage potential impacts associated with its operations. Dam emergency levels Emergency situations are considered those resulting from adverse events that affect dam safety and may cause damage to its structural and operational integrity, the preservation of life, health, assets, and the environment. The emergency should be assessed and classified according to the levels (L) below: L1) When an anomaly is detected that results in the maximum score for the state of conservation or for any other situation with a potential compromise in the safety of the structure, requiring special daily inspections. L2) When the results of actions taken in the referred L1 anomaly are classified as "uncontrolled" or "unextinguished," requiring further special inspections and interventions. L3) When a situation of impending or imminent failure is occurring. The findings of the procedures may rank Vale's structures according to their risk level: L1) Declaration of commencement of emergency with the competent bodies, carrying out actions to restore normality and reinforced monitoring. L2) Intensification of the mitigation and monitoring actions carried out in L1, however, even if there is no finding of impending disruption, the Alert for evacuation of the population in the Self-rescue Zones is carried out in a preventive manner. L3) It is understood that the population located in the area where there would be no time for intervention by the Civil Defense bodies (ZAS) is already evacuated. Communities that have a longer evacuation time are advised on how to proceed, in the event of a real rupture, by these same bodies. To support the iron ore dam management processes, Vale has two IT systems, Geotec (for routine activities such as monitoring and maintenance) and GRG (technical information storage such as Dam Safety Plans). Following the failure of Dam 1 of the Corrego do Feijão Mine in January 2019, procedures for monitoring the structural conditions of all dams were intensified to strengthen preventive and enable corrective actions to be taken in a timely manner. In case of a dam emergency, all actions contained in the Emergency Action Plan for Mining Dams (PAEBM) will be implemented promptly.

W3.3

(W3.3) Does your organization undertake a water-related risk assessment?

Yes, water-related risks are assessed

W3.3a

(W3.3a) Select the options that best describe your procedures for identifying and assessing water-related risks.

Direct operations

Coverage

Full

Risk assessment procedure

Water risks are assessed as part of an enterprise risk management framework

Frequency of assessment

More than once a year

How far into the future are risks considered?

3 to 6 years

Type of tools and methods used

Tools on the market

Enterprise Risk Management

Other

Tools and methods used

WRI Aqueduct

COSO Enterprise Risk Management Framework

ISO 31000 Risk Management Standard

Internal company methods

Comment

We developed an integrated framework for managing risk, which considers the impact on our business of not only market risk factors, but also the following risks: inadequate or failed internal processes, people, systems or external events, risks arising from third-party obligations (credit risk), etc. In 2020, we developed our Water and Water Resources Policy that establishes risk management and impact prevention processes for the entire production chain. It helps to preserve the volume and quality of surface and groundwater in hydrographic basins and marine areas, continuously improving the sustainable management and responsible use of water resources and supports water accessibility and sewage processing projects for communities. Vale has also adapted its global internal standard for management of water resources and effluents to the guidelines of the International Council on Mining and Metals ICMM. To assist the Company in analyzing water risks, we count on the Aqueduct tool. Developed by the WRI (World Resource Institute), this tool provides global-scale water risk mapping to identify the impacts of river floods due to urban damage, the occurrence of floods and the severity of droughts, and the populations affected by these situations. With this tool, it is also possible to correlate our operating units' water use with the degree of risk indicated by Aqueduct.

Supply chain

Coverage

None

Risk assessment procedure

<Not Applicable>

Frequency of assessment

<Not Applicable>

How far into the future are risks considered?

<Not Applicable>

Type of tools and methods used

<Not Applicable>

Tools and methods used

<Not Applicable>

Comment

Other stages of the value chain

Coverage

None

Risk assessment procedure

<Not Applicable>

Frequency of assessment

<Not Applicable>

How far into the future are risks considered?

<Not Applicable>

Type of tools and methods used

<Not Applicable>

Tools and methods used

<Not Applicable>

Comment

(W3.3b) Which of the following contextual issues are considered in your organization's water-related risk assessments?

	Relevance & inclusion	Please explain
Water availability at a basin/catchment level	Relevant, always included	Concerning water availability and quality parameters, Vale undertakes assessments at local level applying its internal knowledge and management procedures, in order to safeguard the operations long term existence, legal compliance, as well as community relationships. Water is relevant, because it is one of the main inputs for Vale's operations, so its lack or scarcity implies a reduction/stoppage in production. The water availability at the basin level is important because water is one of the most important resources in mining, as it accompanies the entire mineral process, from exploration to processing. The water withdrawals from Vale's processes come from the basin superficial water and groundwater where the units are located. The tool used is the WRI Aqueduct Risk Atlas. The Aqueduct tool, developed by the WRI (World Resources Institute), assists in assessing water stress, which provides a global view of the regions most susceptible to fluvial and coastal flooding, the severity of droughts, the seasonal and interannual water variability, as well as its scarcity. In 2020, complementing Aqueduct, we started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria.
Water quality at a basin/catchment level	Relevant, always included	Concerning water availability and quality parameters, Vale undertakes assessments at local level applying its internal knowledge and management procedures, in order to safeguard the operations long term existence, legal compliance as well as community relationships. Water quality at a basin/catchment level is considered in water-related risk assessments and is relevant to Vale's business since it guarantees the desired quality to produce, meets the legal issues that can stop operations and guarantees a good relationship with local communities. The tool used is the WRI Aqueduct Risk Atlas. The Aqueduct tool, developed by the WRI (World Resources Institute), assists in assessing water stress, which provides a global view of the regions most susceptible to fluvial and coastal flooding, the severity of droughts, the seasonal and interannual water variability, as well as its scarcity. In 2020, complementing Aqueduct, we started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria. Vale has a Normative Procedure of global scope to guide the management of water resources and effluents. Vale is in the process of analysis of adherence to this procedure for all its units, which includes the verification of several topics, including: water balance, water availability, monitoring plan, information analysis system, risks indicators, water sustainability strategy, among others. This compliance check is carried out by applying a form and the units need to provide evidence for the responses provided in the questionnaire. Water quality at a basin level is one of the topics evaluated in the procedure adherence form, which assesses the quality of water in catchment sources, the water and effluent quality monitoring plan, the database of quality and quantity of water resources, among others. If the unit showed any gap, it must present an action plan and a schedule to eliminate the deviation.
Stakeholder conflicts concerning water resources at a basin/catchment level	Relevant, always included	The watersheds provide different types of use to different stakeholders at a local level. Using company knowledge to maintain social license to operate as well as to mitigate impacts to the local communities, Vale identifies social impacts and risks: the Community Relationship Department and Vale's Water Basin Committees members track demands and potential conflicts from the local communities, and Vale's Social Policies consider focus on identifying as well as addressing the issues, risks and impacts. If there are stakeholder conflicts, there may be legal restrictions, reduced water use and impacts on the company's image, which is why this issue is relevant to Vale's business. The tool used is the WRI Aqueduct Risk Atlas. The Aqueduct tool, developed by the WRI (World Resources Institute), assists in assessing water stress, which provides a global view of the regions most susceptible to fluvial and coastal flooding, the severity of droughts, the seasonal and interannual water variability, as well as its scarcity. In 2020, complementing Aqueduct, we started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria.
Implications of water on your key commodities/raw materials	Relevant, always included	Water implications on key commodities and raw materials can impact the operating costs and the product environmental footprint. Vale has tracked the main raw materials and performed a product life-cycle assessment (LCA) for its iron ore pellets in Brazil, covering approximately 35% of operations. Through the LCA results, the company could identify hot spots for key raw materials and suppliers. Vale also has controls to identify key suppliers and raw materials that are produced and extracted from areas with water stress.
Water-related regulatory frameworks	Relevant, always included	To assure water legal compliance as well as the company's contribution to the development of public policies, Vale uses internal company knowledge through its corporate water management participation in regulatory discussions with local governments. The operations, at a regional level, also contribute to public policy development with the participation in water basin committees. Through this, Vale works to identify and mitigate regulatory risks. Water-related regulatory frameworks are a relevant issue because changes in regulations can affect the conditions of water use, as water is one of the main inputs to the Vale's business. Sustainability and Reputation Risks Executive Committee requires operations to manage their water-related risks in compliance with applicable laws, regulations and other obligations or requirements. We use the internal company knowledge and the external legal compliance audits to ensure that we stay up to date with current regulatory information and tariffs. The tool used is the WRI Aqueduct Risk Atlas. The Aqueduct tool, developed by the WRI (World Resources Institute), assists in assessing water stress, which provides a global view of the regions most susceptible to fluvial and coastal flooding, the severity of droughts, the seasonal and interannual water variability, as well as its scarcity. In 2020, complementing Aqueduct, we started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria.
Status of ecosystems and habitats	Relevant, always included	Ecosystems and habitats issues are factored in order to maintain legal compliance with local legislation, as well as with Vale's internal requirements. The identification of risks related to ecosystems and habitats helps Vale to implement, monitor and expand projects, considering environmental impacts and potential damage to ecosystems. Vale has a biodiversity management subarea as part of the environmental management system. In addition, treating issues in relation to status of ecosystems and habitats is relevant to the image and good relationship with local communities. Vale preserves ecosystems and habitats the maximum. Even though we are always looking for the best technologies and methods that interfere less with natural resources, our operations impact natural habitats and their biota directly or indirectly. Impacts mainly include habitat conversion, loss and/or reduction, air quality alteration, and specimen loss. In the last year, 6,234 species whose habitats were affected by or near Vale's operations were registered: 2,925 of fauna and 3,309 of flora. The tool used is the WRI Aqueduct Risk Atlas. The Aqueduct tool, developed by the WRI (World Resources Institute), assists in assessing water stress, which provides a global view of the regions most susceptible to fluvial and coastal flooding, the severity of droughts, the seasonal and interannual water variability, as well as its scarcity. In 2020, complementing Aqueduct, we started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria. Besides that, in 2020 Vale also joined the Integrated Biodiversity Assessment Tool (IBAT) for Business that will be implemented in projects and expansions but also to keep risk analysis updated in the territories in which we operate. Ecosystem services on which we depend and on which we have impacts, such as water supply and quality and emissions related to climate regulation, are studied within the physical aspects in environmental impact assessments. Ecosystem services related to the interests and practices of the surrounding communities are also mapped and studied.
Access to fully-functioning, safely managed WASH services for all employees	Relevant, always included	All of Vale's operations provide WASH services for employees and contractors. We follow standards for social action and principles on business and human rights, which are based on the guidelines of the United Nations Human Rights Council. This issue is relevant to ensure the well-being of all employees and the company's image, in addition to maintaining good relations with these stakeholders. The tool used is the WRI Aqueduct Risk Atlas. The Aqueduct tool, developed by the WRI (World Resources Institute), assists in assessing water stress, which provides a global view of the regions most susceptible to fluvial and coastal flooding, the severity of droughts, the seasonal and interannual water variability, as well as its scarcity. In 2020, complementing Aqueduct, we started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria. Vale has a Normative Procedure of global scope to guide the management of water resources and effluents. Vale is in the process of analysis of adherence to this procedure for all its units, which includes the verification of several topics, including: water balance, water availability, monitoring plan, information analysis system, risks indicators, water sustainability strategy, among others. This compliance check is carried out by applying a form and the units need to provide evidence for the responses provided in the questionnaire. WASH services are one of the topics evaluated in the procedure adherence form, which assesses if the unit ensures all employees sanitation facilities, hygiene conditions, supply of potable water for drinking and bathing, among others. If the unit showed any gap, it must present an action plan and a schedule to eliminate the deviation.
Other contextual issues, please specify	Not considered	

(W3.3c) Which of the following stakeholders are considered in your organization's water-related risk assessments?

	Relevance & inclusion	Please explain
Customers	Relevant, not included	Vale's customers are relevant to the company as any other stakeholder. To support customers of strategic importance to our core business, we engage our customers with business meetings, technical meetings, visits, contact by email and phone, Customer Portal, satisfaction survey, forums, seminars and congresses. As relevant as customers are, they are not considered in water-related risk assessments, because in mining, customers are in extremely distant locations. In addition, our clients operate in areas/regions completely different from the areas in which Vale operates. Therefore, if risk assessments were carried out by Vale, they would not be accurate and/or would give very detailed results because Vale does not have specific knowledge about these regions. Given the nature of Vale's business which is focused on mining, we do not anticipate that this will change significantly in the future.
Employees	Relevant, always included	Vale's water management is operationalized by our employees, which makes them a critical player in our water management process. Vale develops action plans to increase awareness and also assesses performance related to environmental and sustainability targets. We aim at developing competencies and encouraging talent by conducting educational activities and offering compensation consistent with the complexity of the job, the performance of our employees and the market. We promote an environment suitable to dialogue, and value straightforward communication. Vale engage with Internal communications (Talk360, webinars, Vale@, Management Bulletins, Intranet, Teams cards, among others); Qualification/training/Sustainability Academy; Thematic groups, Interactive dialogue, Joint action programs and Volunteering.
Investors	Relevant, always included	Investors are aware of water stress and potential impacts and may require Vale's risk management information. Transparency is important to Vale and water issues play an important role to our sustainability management and report, as it is considered one of our top materiality themes. The company presents its water performance and management information in the yearly sustainability report. Furthermore, since 2011, Vale participates in the CDP Water Program. The engagement of Vale's investors took place through letters, questionnaires, meetings, webinars, conferences, roadshows, calls, ESG Portal, RI site, RI email.
Local communities	Relevant, always included	Local communities have the power to retract Vale's social license to operate. Vale's social impacts are identified during the risk analysis and through the Community Relationship Department, tracking demands and potential conflicts. Vale's Social Policies focus on identifying as well as addressing these issues, risks and Vale's impacts. We seek to build strong and lasting relationships with our stakeholders, invest in mitigating the effects of our activities, work with high ethical standards, have a transparent management and actively contribute to the advances related to the environment, biodiversity and sustainable development. In order to engage communities, Vale aims at establishing structured dialogue spaces for the construction of Relationship Plans with the Communities. The Plans have as their principle the social participation and mobilization in the definition and prioritization of social actions to be implemented in the communities. Moreover, the structuring of the Plan aims at sharing responsibilities among company, community and other social players for local development. Vale is making plans in collaboration with communities to form management groups, community visits, monitoring forums; Through the Grievance Mechanism - capturing, registering, responding to and addressing community manifestations and engagement. Ensuring these initiatives play a role throughout the entire business life cycle, from the preliminary phases and including the concept of progressive closure of enterprises in the territories.
NGOs	Relevant, always included	NGOs have the potential to contribute to Vale's risk identification and reporting parameters. To establish partnerships with and proximity to experts from various areas and with diverse expertise and to promote scientific production. Vale promoted meetings and events; Expert panels from Vale Foundation and Vale Cultural Institute; Sounding Panel - an advisory board under the Executive Committee composed of global ESG specialists.
Other water users at a basin/catchment level	Relevant, always included	Other water users at a local level play an important role in water management. Through participating in watershed committees, Vale identifies and understands local stakeholder's expectations as well as the contribution that the company and eventual partners can present to local water management. These stakeholders are included in the risk assessment, because in case of conflict with the interested parties, there may be legal restrictions, reduced water use and impacts on the company's image.
Regulators	Relevant, always included	Vale participates in water resources regulatory agencies discussions in all countries where we operate. The local policy makers and regulators can influence the company's water management substantially. Vale has an environmental management system that includes law tracking as well as participation in the river basin committees (Brazilian operations units). Also, Vale contributed to discussions on the industry chapter of the Brazilian National Adaptation Plan. The National Industry Confederation (CNI) established a working group to address it and engage with the Brazilian Ministry of the Environment on the construction of the Plan – Vale is part of the working group. Important as they are responsible for setting the regulations, developing water pricing reforms and reviewing and approving our water use licenses. And if we are not in compliance with the regulations, we may receive fines that will impact our revenue as well as our reputation.
River basin management authorities	Relevant, always included	River basin management authorities are always included in the company's water-related risk assessments because their decisions may require alterations in Vale's Risk Matrix. To keep track of, and potentially take part in those decisions, Vale participates in water resources management panels in all countries where we operate. In Brazil, Vale participates in 33 River Basin Committees (CBHs) incorporated at our operational units located in river basins, including those in the four river basins from which we have the highest demand for new water. We understand that the management of the river basins we operate in can have direct consequences on mining operations, such as inadequate supply of water or community unrest, impairing the quality and quantity of water.
Statutory special interest groups at a local level	Relevant, always included	The local statutory special interest groups can influence the company's water management substantially. These groups can also provide support the company's project that are beneficial to different stakeholders. Vale has an environmental management system that includes law tracking as well as participation in the river basin committees (Brazilian operations units). The participation of statutory special interest groups at a local level in river basin committees is the way that Vale promotes engagement with this stakeholder to be able to positively influence decisions.
Suppliers	Relevant, sometimes included	Since 2010, Vale has implemented a product life-cycle assessment (LCA) and through this method, has identified the relevant processes and suppliers hotspots categories with material water potential impacts (among other environmental aspects). This assessment was performed for all our iron ore pellets plants in Brazil, covering approximately 35% of operations. The reason is to develop agility in purchasing materials and services; correct our choice of items; and manage the inventory of materials and health, safety and sustainability variables by suppliers. We engage with our suppliers with: Low-carbon forum; Forum: "Chat with supplier"; Business Rounds – FIEMG/ FIEPA/ IBRAM; and Workshop with global category suppliers.
Water utilities at a local level	Relevant, always included	The local water supplier is a key stakeholder to understand the local water consumption, projections and impacts to and from Vale's operations. Vale considers this stakeholder group in their wide stakeholders' engagement process as well as through participation in local policies and watershed committees. These stakeholders are included in the risk assessment, because Water demand from other interest groups in the catchments we operate, can create risks such as community unrest for those operations.
Other stakeholder, please specify	Relevant, always included	Operational risk management is the structured approach we take to manage uncertainty related to internal and external events. Stakeholders are included in external events.

W3.3d

(W3.3d) Describe your organization's process for identifying, assessing, and responding to water-related risks within your direct operations and other stages of your value chain.

Vale's approach to risk considers two levels of assessment: a corporate level, which assesses risks in a holistic manner (top-down), and an operational level, which evaluates risks in processes and tasks (bottom-up). Vale has a Risk Management Policy for the Vale Group and a norm which requires regular evaluation and monitoring of the corporate risks on a consolidated basis in order to guarantee that the overall risk level remains in accordance with the acceptable corporate risk guidelines. The policy establishes guidelines for corporate risk management, considering the lines of defense model and **ISO 31000, ISO 55000 and COSO ERM Framework**, aiming to promote integrated management of all risks to which Vale is exposed, including water-related risks. There are three lines of defense that define the relationship between different areas and hierarchies of the company and its respective scope of responsibilities. The first line includes the operational, business, project, support and administrative areas. These areas are directly responsible for operating the assets and identifying, evaluating, monitoring and managing their risk events in an integrated manner. In the second are the Executive management of Internal Controls, Risk and Compliance and specialist second line of defense. These areas and executives oversee and provide support to the work of the first line of defense, providing qualification and instrumentation for risk management. At the third line we have the Compliance Board. Two areas act: Internal Audit which is responsible for independently evaluating the effectiveness of the company's internal controls and risk management; and the Whistleblower Channel, responsible for receiving, recording and investigating the complaints received through an independent channel, while preserving the anonymity of the whistleblower and ensuring non-retaliation.

The integrated framework for managing risks considers operational risks, geotechnical risks, strategic, financial and cyber risks, compliance risks and Sustainability risks. The outcomes of the risk assessment are used to assess the impact of Vale's new investments, acquisitions and divestitures, as well as to match the Company's risk appetite (which represents the extent to which the company is willing to accept each type of risk) to the needs of its growth plan, strategic planning and business continuity.

W4.1

(W4.1) Have you identified any inherent water-related risks with the potential to have a substantive financial or strategic impact on your business?

Yes, only within our direct operations

W4.1a

(W4.1a) How does your organization define substantive financial or strategic impact on your business?

i) Substantive impact definition:

A substantive financial or strategic impact is defined as any event that might cause a negative impact on health, safety, environment, reputation, financial, human rights and social issues. Also, we consider a substantial financial impact to be between 5 and 10% of EBTIDA, around US\$ 1 billion.

A substantial strategic impact can be related to the good quality freshwater available for use, considering that Vale's operations depend directly on the available of this resource that in case of lack compromise the mining process.

ii) The measure(s), metric(s) or indicator(s) used to identify substantive change:

The company takes into account the water usage as well as the economic relevance/impact of the direct operations. Regarding Vale's water risk management, the impacts on the resources and resource dependency are taken into account. A Table of Severity and Probability is a tool used to determine the extent of an impact. By putting together an analysis of progressive severity of the impacts with the probability of occurrence of mapped risks, it is possible to obtain the most relevant risks and act in order to prioritize them.

Vale also employs the WRI Aqueduct risk assessment tool to monitor and identify water-related risks. This tool provides global-scale water risk mapping to identify the impacts of river floods due to urban damage, the occurrence of floods and the severity of droughts, and the populations affected by these situations. With this tool, it is possible to correlate our operating units' water use with the degree of risk indicated by WRI Aqueduct.

It is considered that locations with high and very high water scarcity risks are the ones in which our operations can also be significantly affected. For these locations, the water factor could generate a substantial change within Vale's direct operations, which impact operations and projects and increase conflicts over the need for water.

Vale's methodology to manage corporate risks combines information on risks' inferred frequency and severity to classify them in terms of priority. Risks are classified as high, medium or low residual risk (remaining risks after mitigation controls are implemented). High risks are those that combine high-frequency rates (monthly or annual) and high severity values (more than ten million, multiple fatalities, environmental damages, penalties, etc) depending on the combination at the risk matrix.

The severity level depends on the risk assessment scope and objectives and the level of effect (greatest level) between the various types of impacts on the environment, social, reputation, financial, etc. The likelihood of the impact is also analyzed based on the historical events and experience of the employees from the respective regions and/or corporate. It is also necessary to take into account the controls that are already in place or, in the case of projects, which are planned and budgeted. Considering the controls currently implemented, it is also important to check the residual risk and assess its level of acceptability, defining the needs for additional measures.

iii) Thresholds used to qualify the magnitude of financial impact:

The financial impacts considered as substantive apply to Vale's direct operations and are classified in the planning, development and management standard (NFN-0001) in the dimensions below:

- Moderate (greater than US\$ 100 million to US\$ 300 million);

- Serious (greater than US\$ 300 million to US\$ 1 billion);

- Critical (greater than US\$ 1 billion to US\$ 3 billion);

- Very critical (greater than US\$ 3 billion)

iv) The definition applies to direct operations.

v) Example of substantive impact considered:

An example of a substantive financial or strategic impact identified in 2018 concerns water restriction, which could lead to a financial impact of US\$ 183,1 million. Besides that, another identified example of how water-related issues could impact our business, is the presence of groundwater in operating sites, which could be an obstacle to our enterprises, leading to a financial impact of more than US\$ 100 million.

In 2019, the failure of Dam I of the Córrego do Feijão Mine impacted our strategy and future economic performance. These circumstances led us to develop new management approaches on how we define a substantive financial or strategic impact on our business. Although the failure of the dam had not been caused by water security policies, the incident has as one of its consequences the worsening of water security. Since dams are imperative to our operations, Vale requires periodic reviews of the dams' physical and hydraulic safety conditions, carried out by external and independent companies. These reviews comply with Brazilian legal requirements and commitments established with Brazilian authorities, such as the Public Prosecutors' Office and the National Mining Agency (ANM).

W4.1b

(W4.1b) What is the total number of facilities exposed to water risks with the potential to have a substantive financial or strategic impact on your business, and what proportion of your company-wide facilities does this represent?

	Total number of facilities exposed to water risk	% company-wide facilities this represents	Comment
Row 1	2	1-25	To assist the Company in analyzing water risks, we count on the Aqueduct tool. Developed by the WRI (World Resource Institute), this tool provides global-scale water risk mapping to identify the impacts of river floods due to urban damage, the occurrence of floods and the severity of droughts, and the populations affected by these situations. With this tool, it is also possible to correlate our operating units' water use with the degree of risk indicated by Aqueduct. The WRI Aqueduct tool rates the overall water risk of these facilities location as at least medium. The accuracy of the databases to generate these global assessments has increased substantially in recent years and is continually improving, however, it is necessary to verify and complement these assessments considering the knowledge and perceptions of local operational water risks, their possible impacts and mitigations' actions. In this sense, in 2020 we started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria. This methodology was applied in 46 operational units considering the following physical risks: floods, conflict over use, supply and droughts. It is noteworthy that an operational unit may be exposed to more than one physical risk and the results of this methodology are presented below, indicating the general result as well as for each of the types of physical risks considered. Vale's water risk management actions and initiatives has a local and global nature, and involves the review and improvement of governance processes, establishment of new policies, HIRA application and updating of the units' master plans, in addition to alignment with the established principles by ICMM (International Council on Mining and Metal). In 2020, Vale has also prepared and published the Water and Water Resources Policy that approaches the principles and commitments wich Vale's activities will be guided.

W4.1c

(W4.1c) By river basin, what is the number and proportion of facilities exposed to water risks that could have a substantive financial or strategic impact on your business, and what is the potential business impact associated with those facilities?

Country/Area & River basin

Oman	Other, please specify (No river basin)
------	--

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

7625689

% company's annual electricity generation that could be affected by these facilities

<Not Applicable>

% company's global oil & gas production volume that could be affected by these facilities

<Not Applicable>

% company's total global revenue that could be affected

Less than 1%

Comment

The WRI Aqueduct tool rates the overall water risk of this facility location as extremely high. To calculate potential financial impact was consider 2.2US\$/t and totally closed activities. In 2020, Vale also started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria. Oman's facility is considered in this analysis as medium probability area of chances of occurring restriction of third party water supply.

Country/Area & River basin

Mozambique	Other, please specify (No river basin)
------------	--

Number of facilities exposed to water risk

1

% company-wide facilities this represents

1-25

Production value for the metals & mining activities associated with these facilities

5877737

% company's annual electricity generation that could be affected by these facilities

<Not Applicable>

% company's global oil & gas production volume that could be affected by these facilities

<Not Applicable>

% company's total global revenue that could be affected

1-10

Comment

The WRI Aqueduct tool rates the overall water risk of this facility location as high. To calculate potential financial impact was consider 130.8 US\$/t and totally closed activities. In 2020, Vale also started applying a water risk sensitivity analysis methodology for each operational unit, that is, the local scale of physical risks and internal technical criteria. Mozambique's facility is considered in this analysis as high probability area of chances of occurring droughts and conflicts over water use affecting water withdrawal.

(W4.2) Provide details of identified risks in your direct operations with the potential to have a substantive financial or strategic impact on your business, and your response to those risks.

Country/Area & River basin

Brazil	Other, please specify (All basins In Brazil)
--------	--

Type of risk & Primary risk driver

Physical	Rupture of tailings dams and toxic spills
----------	---

Primary potential impact

Other, please specify (Social, environmental and economic impact.)

Company-specific description

Dams are structures used as a reservoir to contain or accumulate liquid substances or a mixture of liquids and solids from the ore processing. Vale operates more than 100 iron ore dams in Brazil, most of them located in Minas Gerais. In addition, the company has also iron ore dams in Pará and in Mato Grosso do Sul. Tailing dam collapse can spread over a million cubic meters of tailings in huge areas. Operational and administrative areas of the mine, such as offices, maintenance workshops, locker rooms, refectory, mill, and loading terminal, among other structures and also employees can be impacted by the tailings. Road access, villages nearby and rivers can also be impacted by the torrent of tailings, immediately causing social and environmental issues. Therefore, rupture of tailings dams and toxic spills can directly impact the company's operation, such as the Brumadinho event. In its worst scenario, the operation ceases, affecting directly Vale's operations.

Timeframe

More than 6 years

Magnitude of potential impact

High

Likelihood

Unlikely

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

5257000000

Potential financial impact figure - minimum (currency)

<Not Applicable>

Potential financial impact figure - maximum (currency)

<Not Applicable>

Explanation of financial impact

The financial impact considers the blocking of resources and imposition of administrative sanctions, the company immediate assistance and emergency actions, preliminary agreements and emergency indemnifications, voluntary financial support to affected families, special support to traditional communities, the investment in health professionals and medicines, diverse environmental monitoring and investments on dam's safety and decommissioning. The declared value of the potential financial impact refers to the possible cost in the event of a dam rupture, in this way, the main impacts in our income statement for the year ended December 31, 2020 was US\$ 5.257 billion, including expenses and provisions to meet our obligations in connection with the decharacterization of our upstream dams and the obligations we assumed in preliminary settlement agreements.

Primary response to risk

Improve monitoring

Description of response

In December 2015, the Geotechnical Risk Management area was created, with a specific focus on dams. In 2016, R\$ 109 million were applied to improve dam control. In 2017, R\$ 180 million were invested in maintenance services, monitoring, improvement works, audits, risk analysis, revisions of Action Plans for Emergencies of Mining Dams (PAEBM) and warning system implementation. In 2019, right after the Brumadinho dam collapse, Vale created the Extraordinary Independent Consulting Committees, focusing on Investigation, Support and Recovery, and Dam Safety. The Committees were dedicated to measure the assistance to those affected by the collapse (Support and Recovery) and to advise on issues related to safety conditions, management, and mitigation of risks related to Vale's dams and dikes (Dam Safety). The approval of the Emergency Plan for decommissioning upstream dams is contemporaneous to the Committees. In 2020, Vale maintained its dam management in line with the best and most rigorous international practices, integrated with the movements of society and updated with the advances in legislation. For this reason, we have intensified the monitoring of our structures and the assessments of their conservation status, in order to anticipate the problems through preventive and corrective measures. Vale is focused on the evolution of its Tailings & Dams Management System ("TDMS") for the Ferrous, Coal and Base Metals businesses. During 2019 and 2020, Vale worked closely with the International Council on Mining and Metals (ICMM) and participated actively in the Global Industry Standard on Tailings Management ("GISTM") – an effort whose purpose is to improve safety through all phases of the tailings storage facilities life-cycle. Vale's Board of Directors approved, in October 2020, a new Policy for Dam Safety and Geotechnical Mining Structure, which counts with the GISTM as one of its references. Among other guidelines, the policy enforces that all components of Vale's TDMS are designed with continuous improvement elements, using and applying the best available technology and best practices according to international institutions, including the ICMM.

Cost of response

617000000

Explanation of cost of response

Since 2019, Vale has been developing the de-characterization plan for upstream structures was updated in September 2020, based on information and studies on the company's structures, which are continuously updated. The plan considers 29 geotechnical structures, comprising: 14 dams, of which 1 (8B) was already de-characterized; 13 dikes, of which 2 (2 Kalunga and 3 Kalunga) was already de-characterized; and 2 drained stacks. To allow de-characterization works under safer conditions and to increase safety in areas downstream of dams, in specific cases, Vale is building containment structures, or back-up dams. As of December 31, 2020, we recognized provisions in connection with the decharacterization of dams in the aggregate amount of US\$ 617 million. All the plans about water risk are being developed, focusing on maintenance services, monitoring, improvement works, audits, risk analysis, revisions of Action Plans for Emergencies of Mining Dams (PAEBM) and warning system implementation. The response cost is calculated through the FMEA risk analysis.

W4.2c

(W4.2c) Why does your organization not consider itself exposed to water risks in its value chain (beyond direct operations) with the potential to have a substantive financial or strategic impact?

	Primary reason	Please explain
Row 1	Risks exist, but no substantive impact anticipated	As a mineral resources company, water for our direct use is critical to our operations (mining and refining minerals and transforming into products). Due to the fact that our operations represent the first step of the mineral industry value chain, the availability of sufficient amounts of water across our clients and suppliers is important to our business continuance. The company has practices for its value chain, but does not measure its financial or strategic impact. It is known that risks exist, but so far water issues have not had any substantive financial or strategic impact on Vale's operations.

W4.3

(W4.3) Have you identified any water-related opportunities with the potential to have a substantive financial or strategic impact on your business?

Yes, we have identified opportunities, and some/all are being realized

W4.3a

(W4.3a) Provide details of opportunities currently being realized that could have a substantive financial or strategic impact on your business.

Type of opportunity

Efficiency

Primary water-related opportunity

Improved water efficiency in operations

Company-specific description & strategy to realize opportunity

Vale developed a revolutionary technique to process iron ore in regions of high rainfall that eliminates the use of water. The processing of iron ore from natural moisture is an innovation that reduces Vale's environmental impacts. The technology was first implemented at Carajás, Vale's biggest operation, located in the Amazon region in northern Brazil. The implementation of the new technology in Carajás has eliminated the water use in 11 out of 17 beneficiation lines, reducing water usage in approximately 10 million m³ per year. The natural moisture beneficiation method developed has become a reference for the sustainable use of environmental resources and is already being implemented into Vale's new projects, such as Serra Norte and S11D, in Brazil. The company prioritizes this type of production when possible according to the characteristics of the ore. This opportunity is considered strategic for Vale because it results the natural resource preservation. There are currently eight lines that work with dry processing, affording a 63% reduction in total water catchment. The processing of natural moisture contributes in order to reuse 75% of all water consumed by Vale. In addition, Vale has begun projects for dry stacking and filtering systems at the Vargem Grande, Conceição and Brucutu sites. Over the next few years, this system will be implemented at other units that still use wet processing technologies, such as Itabira. USD 2.3 billion will be invested by 2025. With a pioneering dry iron ore beneficiation technology, through New Steel, we are also developing a process route for concentrating iron ore fines through magnetic concentration.

Estimated timeframe for realization

4 to 6 years

Magnitude of potential financial impact

Medium-high

Are you able to provide a potential financial impact figure?

Yes, a single figure estimate

Potential financial impact figure (currency)

2300000000

Potential financial impact figure – minimum (currency)

<Not Applicable>

Potential financial impact figure – maximum (currency)

<Not Applicable>

Explanation of financial impact

Since the method does not use water in the process, it does not generate mining tailings and therefore does not use dams. The financial impact is the estimated amount to apply to similar processing facilities in the next five years. Nowadays, the goal is to reach 70% by 2024.

W5. Facility-level water accounting

W5.1

(W5.1) For each facility referenced in W4.1c, provide coordinates, water accounting data, and a comparison with the previous reporting year.

Facility reference number

Facility 1

Facility name (optional)

Oman

Country/Area & River basin

Oman	Other, please specify (No river basin)
------	--

Latitude

24.511622

Longitude

56.598384

Located in area with water stress

Yes

Primary power generation source for your electricity generation at this facility

<Not Applicable>

Oil & gas sector business division

<Not Applicable>

Total water withdrawals at this facility (megaliters/year)

1423.8

Comparison of total withdrawals with previous reporting year

Lower

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

0

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

1423.8

Total water discharges at this facility (megaliters/year)

14.24

Comparison of total discharges with previous reporting year

About the same

Discharges to fresh surface water

14.24

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

1409.56

Comparison of total consumption with previous reporting year

Lower

Please explain

Vale's plant in Oman has a high rate of water reuse and recirculation. Thus, the discharge has reduced volume. Still, some discharges are diffused. Vale defined the limits for the Comparison of total withdrawals / consumption / discharge with previous reporting year at: difference of up to 5% - about the same; difference greater than 5% up to 50% - lower/higher; difference greater than 50% - much lower/much higher.

Facility reference number

Facility 2

Facility name (optional)

Mozambique

Country/Area & River basin

Mozambique	Other, please specify (No river basin)
------------	--

Latitude

-16.166062

Longitude

33.807821

Located in area with water stress

Yes

Primary power generation source for your electricity generation at this facility

<Not Applicable>

Oil & gas sector business division

<Not Applicable>

Total water withdrawals at this facility (megaliters/year)

8457.27

Comparison of total withdrawals with previous reporting year

Higher

Withdrawals from fresh surface water, including rainwater, water from wetlands, rivers and lakes

0

Withdrawals from brackish surface water/seawater

0

Withdrawals from groundwater - renewable

8457.27

Withdrawals from groundwater - non-renewable

0

Withdrawals from produced/entrained water

0

Withdrawals from third party sources

0

Total water discharges at this facility (megaliters/year)

84.57

Comparison of total discharges with previous reporting year

Higher

Discharges to fresh surface water

84.57

Discharges to brackish surface water/seawater

0

Discharges to groundwater

0

Discharges to third party destinations

0

Total water consumption at this facility (megaliters/year)

8372.7

Comparison of total consumption with previous reporting year

Higher

Please explain

Variation in withdrawals and discharges are related to production. Vale defined the limits for the Comparison of total withdrawals/ consumption/discharge with previous reporting year at: difference of up to 5% - about the same; difference greater than 5% up to 50% - lower/higher; difference greater than 50% - much lower/much higher.

W5.1a

(W5.1a) For the facilities referenced in W5.1, what proportion of water accounting data has been externally verified?

Water withdrawals – total volumes

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water withdrawals – volume by source

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water withdrawals – quality

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water discharges – total volumes

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water discharges – volume by destination

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water discharges – volume by treatment method

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water discharge quality – quality by standard effluent parameters

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water discharge quality – temperature

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water consumption – total volume

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale's Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles¹ of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

Water recycled/reused

% verified

76-100

What standard and methodology was used?

The quantitative information reported is sourced from our GRI performance indicators, reported also at Vale' Integrated Report. In 2020, the Integrated Report was audited by Bureau Veritas. The scope of this verification encompassed the Standards and Principles1 of the Global Report InitiativeTM for Sustainability Reports, including GRI's Mining and Metals Sector Disclosures (2013). Additionally, we assessed: (1) A set of Vale's self-assessment forms, specially prepared to comply with the Mining Principles of the International Council on Mining & Metals (ICMM), updated in 2020; (2) The adherence of Vale's Integrated Reporting to the requirements of the International (IR) Framework of the International Integrated Reporting Council (IIRC) 2020.

W6. Governance

W6.1

(W6.1) Does your organization have a water policy?

Yes, we have a documented water policy that is publicly available

W6.1a

(W6.1a) Select the options that best describe the scope and content of your water policy.

Scope	Content	Please explain
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	Scope	Content	Please explain
Row 1	Company-wide	<p>Description of business dependency on water</p> <p>Description of business impact on water</p> <p>Description of water-related performance standards for direct operations</p> <p>Description of water-related standards for procurement</p> <p>Reference to international standards and widely-recognized water initiatives</p> <p>Company water targets and goals</p> <p>Commitment to align with public policy initiatives, such as the SDGs</p> <p>Commitments beyond regulatory compliance</p> <p>Commitment to water-related innovation</p> <p>Commitment to stakeholder awareness and education</p> <p>Commitment to water stewardship and/or collective action</p> <p>Commitment to safely managed Water, Sanitation and Hygiene (WASH) in the workplace</p> <p>Commitment to safely managed Water, Sanitation and Hygiene (WASH) in local communities</p> <p>Acknowledgement of the human right to water and sanitation</p> <p>Recognition of environmental linkages, for example, due to climate change</p>	<p>Our water policy is company-wide in scope and states the procedures to meet regulatory compliance, but with our policy, we go beyond that. The mining sector is essential to provide natural resources that boost economic development and social well-being, with surface water and groundwater being a fundamental input and present in all phases of mining, from conceptual projects to post-closure. The main uses of water in mining are for ore processing, machinery cleaning, environmental controls, hygiene and human consumption. To know the boundary conditions of the catchment is fundamental where a mining enterprise will be developed through previous diagnosis and/or specific studies, for example water quality, availability, risks and opportunities. As a guideline for its actions, Vale has set the 2030 Water Target which aims to reduce the freshwater withdrawal to processes per ton produced, which means less freshwater withdrawal for the same production. This target is part of the Structural Plan for Water Resources 2030, which is part of the socio-environmental goals voluntarily assumed (Vale's socio-environmental targets are in line with the SDG). To achieve the 2030 Water Target, we have been investing in the expansion of the water monitoring network, in initiatives to reuse effluents in our processes, in the search for new technologies and in the development of studies aimed at the continuous improvement of water stewardship considering the catchment where Vale operates, and more specifically in Vale's area of influence, to achieve adherence to International Council on Mining and Metals. In addition to the content present above, the policy also has among its commitments: Support projects of accessibility to water and sewage treatment preferably in communities surrounding our operations; Map and manage water resources risks and impacts, considering the catchment as a reference and marine areas where Vale operates. Regarding water-related standards for procurement, the area responsible for contracting must ensure that the service provider complies with the agreed specifications. All interested parties are made aware and educated on the various topics that they are involved, whether in water risk issues, as in corporate reports, corporate area of environmental management and water and effluent resources. Vale also complies with the Mitigation and Adaptation to Climate Change Policy (POL 0012-G) with a commitment to reduce its greenhouse gas (GHG) emissions.</p>

W6.2

(W6.2) Is there board level oversight of water-related issues within your organization?

Yes

W6.2a

(W6.2a) Identify the position(s) (do not include any names) of the individual(s) on the board with responsibility for water-related issues.

Position of individual	Please explain
Board-level committee	In 2020, Vale created the Water Resources (WR) Forum that integrates operational unit teams to conduct technical discussions on how to manage WR and effluents in a standardized way. Meetings take place every two months, with the participation of the operations' WR Coordinators and other professionals. Relevant matters are presented to Vale's top leadership through Performance Meetings and the appropriate Risk Executive Committees (REC). Annually, advances in the management of these topics are presented to the Sustainability Committee. The REC, created by Vale's Board of Directors, are divided into 5 Committees: Operational Risks, Geotechnical Risks, Strategic, Financial and Cyber Risks, Compliance Risks and Sustainability and Reputation Risks. The last advises the Board on sustainability related issues, including water. The Executive Vice President of Sustainability (EVPS), a position equivalent to the CSO, in 2020 coordinated the approval by the Board of Directors of the Water and Water Resources Policy.
Chief Sustainability Officer (CSO)	The executive directors are the company's legal representatives and are responsible for day-to-day operations and the implementation of the general policies and guidelines set forth by the Board of Directors. The Executive Officer of Sustainability and Institutional Relations is responsible for water issues. In 2020, the EVPS coordinated the approval by the Board of Directors of the Water and Water Resources Policy. In 2020, Vale created the Water Resources Forum that integrates operational unit teams to conduct technical discussions on how to manage water resources and effluents in a standardized way. Meetings take place every two months, with the participation of the operations' Water Resources Coordinators and other professionals. Relevant matters are presented to Vale's top leadership through Performance Meetings and the appropriate Risk Executive Committees. Annually, advances in the management of these topics are presented to the Sustainability Committee.

W6.2b

(W6.2b) Provide further details on the board’s oversight of water-related issues.

	Frequency that water-related issues are a scheduled agenda item	Governance mechanisms into which water-related issues are integrated	Please explain
Row 1	Scheduled - all meetings	Monitoring implementation and performance Overseeing major capital expenditures Providing employee incentives Reviewing and guiding annual budgets Reviewing and guiding major plans of action Reviewing and guiding risk management policies Reviewing and guiding strategy Reviewing and guiding corporate responsibility strategy Reviewing innovation/R&D priorities Setting performance objectives	The Board of Directors monitors the implementation of policies within the company, which includes the water policy. In order to do that, the Board shall meet on a monthly basis to monitor and evaluate the Company’s economic and financial performance and to deliberate on strategic guidelines and plans (Executive Committee’s Performance Meetings) which discuss issues related to Sustainability, as water resources. Additional meetings can be called by its chairman, vice-chairman or any two directors to discuss Water issues if needed. The Sustainability Committee advises the Board on sustainability-related issues, including water. The Committee works continuously, not only upon demand of the Board, and follows an annual calendar. At least 2 members of the Committee must be also members of the Board. Among some of the attributions that belong to the Sustainability Committee, we highlight: assist in the definition, evaluation and monitoring of the Sustainability indicators and propose improvements (including internal water indicators); evaluate and propose Vale’s adoption or permanence to initiatives or agreements at the national or international level related to issues of social and environmental responsibility, as well as monitoring the preparation and dissemination of the Integrated Report, CDP questionnaire. Initiatives as well as the Company’s investment proposals from the perspective of sustainability (including issues of water) and innovation, in addition to making possible recommendations to the Board of Directors; and monitor the scope of action and effectiveness of the area of institutional relations in dealings with regulatory bodies and other institutional relations associated with sustainability issues. In 2020, Vale created the Water Resources Forum that integrates operational unit teams to conduct technical discussions on how to manage water resources and effluents in a standardized way. Meetings take place every two months, with the participation of the operations’ Water Resources Coordinators and other professionals. Relevant matters are presented to Vale’s top leadership through Performance Meetings and the appropriate Risk Executive Committees. Annually, advances in the management of these topics are presented to the Sustainability Committee. Annually, water KPIs, such as water volume and percentage and water stress level in millions of m ³ , are reported to the Board of Directors.

W6.3

(W6.3) Provide the highest management-level position(s) or committee(s) with responsibility for water-related issues (do not include the names of individuals).

Name of the position(s) and/or committee(s)

Chief Executive Officer (CEO)

Responsibility

Both assessing and managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues

More frequently than quarterly

Please explain

The CEO is the highest-level in management position responsible for water. This position is below the Board of Directors-BoD and acts as interface between the Executive Office, such as the Executive Vice President of Sustainability (a position equivalent to the CSO), CRO and the BoD which also deals with issues related to water, mainly with the Sustainability and Reputation Committee. The CEO is responsible for carrying out the business strategy defined by the BoD, for drafting plans and projects, and for Vale’s operational and financial performance. The CEO is responsible for the entire management of the Vale, therefore he is accountable for water-related R&O. He also takes part in monthly meetings (Executive Board’s Performance Meetings) with the participate of the Executive Committee, Directors and Managers which discuss issues related to Sustainability (as water resources) beyond the water KPIs monitoring (volume and % of water and water stress level) related to the Water Goal.

Name of the position(s) and/or committee(s)

Chief Sustainability Officer (CSO)

Responsibility

Both assessing and managing water-related risks and opportunities

Frequency of reporting to the board on water-related issues

More frequently than quarterly

Please explain

The executive directors are the company’s legal representatives and are responsible for day-to-day operations and the implementation of the general policies and guidelines set forth by the Board of Directors. The Executive Officer of Sustainability and Institutional Relations is responsible for water issues. The water KPIs (volume and percentage of water and water stress level) related to the Water Goal are monitored monthly at this performance meetings attended by the CEO, the Executive Committee, Directors and Managers. The Executive Vice President of Sustainability (EVPS), a position equivalent to the CSO, in 2020, approved our Water and Water Resources Policy.

W6.4

(W6.4) Do you provide incentives to C-suite employees or board members for the management of water-related issues?

	Provide incentives for management of water-related issues	Comment
Row 1	Yes	

W6.4a

(W6.4a) What incentives are provided to C-suite employees or board members for the management of water-related issues (do not include the names of individuals)?

	Role(s) entitled to incentive	Performance indicator	Please explain
Monetary reward	Corporate executive team Chief Executive Officer (CEO) Chief Financial Officer (CFO) Chief Operating Officer (COO) Chief Purchasing Officer (CPO) Chief Risk Officer (CRO) Chief Sustainability Officer (CSO)	Reduction of water withdrawals Reduction in consumption volumes Improvements in efficiency - direct operations Improvements in efficiency - product-use	The indicators (environmental and social) are relevant and strategic for Vale, because work as metrics to assess the sustainability of the different business areas linking the compensation of our employees as our goals, helping the sustainable performance of the Company and the return for its investors. The Sustainability KPI goals program encourages the continuous improvement of the company's performance on material socio-environmental issues and integrates the variable remuneration of all Vale employees and impacts all hierarchical levels, up to the CEO. All of these goals, once defined, are registered and monitored in the Career, Succession and Performance (CSP) system. Starting in 2020, part of the long-term variable compensation will included 10% of Sustainability targets. Within sustainability, we have 5 pillars of the Virtual Shares Plan (VSP) that involve this remuneration and one of them is water resources. Therefore, the remuneration for the water target is 2% annually if the target was achieved. In 2020, the water target was not achieved, resulting in the removal of the bonus linked to water resources in the monetary reward. The indicators chosen measure the reduction in water withdrawal and in consumption, in addition to improving the efficiency of operations and the water conditions in the surroundings of Vale's units.
Non-monetary reward	No one is entitled to these incentives	<Not Applicable>	Vale has no non-monetary rewards. The only incentive that exists is in relation to profit sharing, where if the water target is reached, employees receive a bonus.

W6.5

(W6.5) Do you engage in activities that could either directly or indirectly influence public policy on water through any of the following?

- Yes, direct engagement with policy makers
- Yes, trade associations
- Yes, funding research organizations

W6.5a

(W6.5a) What processes do you have in place to ensure that all of your direct and indirect activities seeking to influence policy are consistent with your water policy/water commitments?

In implementing our strategy, Vale pays attention to international scientific fundamentals, regulatory framework and stakeholders' expectation.

Vale, with the launch of Water Goal in 2018, aligned with the UN SDGs, has aimed to strengthened initiatives addressing governance and the execution of actions in its operational units.

The Company complies with its quantitative and qualitative monitoring of water resources and effluents, which includes its legal obligations.

Vale participates in regulatory discussions with local governments and also contributes to public policy development with the participation in several engagement forums, such as CEBDS, FIEMG, IBRAM, among others that Vale may participate in (eg water basin committees).

Vale has a Code of Conduct that guide all those who act on Vale's behalf on how to behave correctly, to overcome dilemmas and always make the best decisions in an ethical and responsible manner.

When inconsistency is discovered, anyone (inside or outside Vale) who wants to report a case of suspicion or ethical misconduct, should use Vale's Whistleblower Channel. This process is structured to ensure absolute confidentiality and allows the company to be aware of any inconsistency reported and then take the appropriate measure to solve it. Appropriate actions will be recommended and implemented depending on the level of inconsistency, including: formal feedback, warning, training, suspension, dismissal or other legal measures.

W6.6

(W6.6) Did your organization include information about its response to water-related risks in its most recent mainstream financial report?

Yes (you may attach the report - this is optional)

FRE_Vale_2020_i_vf.pdf

W7. Business strategy

W7.1

(W7.1) Are water-related issues integrated into any aspects of your long-term strategic business plan, and if so how?

	Are water-related issues integrated?	Long-term time horizon (years)	Please explain
Long-term business objectives	Yes, water-related issues are integrated	11-15	Since sustainability is one of Vale's strategic pillars, water-related issues are clearly integrated into the Company's strategy for achieving long-term objectives, that are approached below (2020 actions). In July 2018, Vale approved a new organizational sustainability framework designed to improve the approach and results of this strategy. Vale is positioned to become a benchmark in sustainability by 2023. With one of Vale's priorities being voluntary environmental and social strategic investments aligned with the Sustainable Development Goals, Vale defined the Water Goal 2030 commented in the item above. Vale has a Normative Procedure of global scope to guide the management of water resources and effluents. Vale is in the process of analysis of adherence to this procedure for all its units, which includes the verification of several topics, including: water balance (Water intakes by abstraction for human and industrial consumption are considered, as well as outputs: sanitary and industrial effluents, storm drains), water availability, monitoring plan (considers the parameters of quality and quantity of water resources and effluents), information analysis system, risks indicators, water sustainability strategy, among others. The water-related issues are also related to mine closure and post-closure steps.
Strategy for achieving long-term objectives	Yes, water-related issues are integrated	11-15	Since sustainability is one of Vale's strategic pillars, water-related issues are clearly integrated into the Company's strategy for achieving long-term objectives, that are approached below (2020 actions). In July 2018, Vale approved a new organizational sustainability framework designed to improve the approach and results of this strategy. Vale is positioned to become a benchmark in sustainability by 2023. With one of Vale's priorities being voluntary environmental and social strategic investments aligned with the Sustainable Development Goals, Vale defined the Water Goal 2030 commented in the item above. In 2020, Vale's main water resources management actions were: Innovation and R&D (Developed a continuous online water quality monitoring system and Developed equipment to continuously monitor water quality); Management and monitoring (Expanded and improved the quantitative monitoring network and Expanded the water resources data management system in the operational units); Governance – Standards and processes (Prepared and published the Water and Water Resources Policy, Adapted the Internal Global Standard for Water Resources and Wastewater Management to ICMM guidelines, Verified our operational units' adherence in Brazil to the global internal standard for water resource and effluent management, Instituted the Water Resources Forum, Managed water risk, Analyzed water risks and sensitivity to operations, and Practiced responsible management strategy.
Financial planning	Yes, water-related issues are integrated	11-15	Water-related issues (listed below) have been integrated into Vale's financial planning on account of the dedicated budget for water management processes, set up within the Company's long-term sustainability strategy. By 2030, Vale plans to spend a total of USD 57.4 million in water management USD 10.3mi, water-related capital and operational investments USD 35.6mi, and water-related R&D USD 11.5mi. The company has planned to significantly reduce the use of dams and will invest in solutions to replace wet processing with safer and more sustainable processes. This is the case of dry processing, which will reach 70% of our iron ore production by 2024. Regarding the rest of the wet production, 16 percentage points will use the dry filtering and stacking system for tailings treatment, which will require approximately USD 2.3 billion by 2025. The system is being implemented at the Vargem Grande, Itabira and Brucutu complexes. Vale also plans to increase the development of new technologies, such as dry magnetic separation of iron ore, currently at the testing phase. The treatment plants Serra Leste and S11D also do not use water to ore treatment. In S11D, for example, using the natural moisture processing route reduces water consumption by 93% compared to a conventional iron ore production project. In Minas Gerais, dry processing was increased from 20% (2016) to 32% (2019). Today, this type of processing is present in several units, such as Brucutu, Alegria, Pico, among others.

W7.2

(W7.2) What is the trend in your organization's water-related capital expenditure (CAPEX) and operating expenditure (OPEX) for the reporting year, and the anticipated trend for the next reporting year?

Row 1

Water-related CAPEX (+/- % change)

90.89

Anticipated forward trend for CAPEX (+/- % change)

0

Water-related OPEX (+/- % change)

28.71

Anticipated forward trend for OPEX (+/- % change)

0

Please explain

Vale's water-related spending in 2020 amounted US\$ 75.4 million to CAPEX and US\$ 49.8 million to OPEX. In 2019, these values were US\$ 39.5 million and US\$ 35.5 million, respectively. The variations are due to expenses related to Brumadinho. Were considered repair activities involving the containment and removal of sediments, monitoring of water quality (WQ) and the preservation and restoration of fauna and flora; completion of the works of two water mains to capture water in Pará de Minas; monitoring and precautionary measures. In addition, they were carried out into CAPEX: water supply works-supply systems, drilling and reactivation of wells and high performance treatment systems; OPEX: WQ monitoring and distribution. Vale cannot yet determine the anticipated forward trend for its water-related capital and operating expenditure, as it is an exceptionally fluctuating expenditure, depending on the Company's current needs. However, spending is expected to be very similar to that of 2021.

W7.3

(W7.3) Does your organization use climate-related scenario analysis to inform its business strategy?

	Use of climate-related scenario analysis	Comment
Row 1	Yes	The analysis of climate-related scenarios allows Vale to identify indicators to monitor the external environment and more quickly recognize changes in the scenarios, allowing an agile adaptation to current needs. As the TCFD suggests, in 2020 Vale opted to use the International Energy Agency (IEA) scenarios, which are recognized by the industry and have international backing. In 2020 Vale updated its qualitative analysis of the vulnerabilities and probability of impacts related to climate change in some operations, a work aimed at the long-term, and carried out in parallel to the work by the ITV on climate projections and by the operational areas for the adaptation and better management of water resources. For this purpose, a tool proposed by the Standard Chartered Bank was utilized, which indicates on a map the points most likely to be impacted by climate changes, such as flooding and sea level rise. The analysis uses projections based on IPCC, RCP 2.6, RCP 4.5 and RCP 8.5 Scenarios.

W7.3a

(W7.3a) Has your organization identified any water-related outcomes from your climate-related scenario analysis?

Yes

W7.3b

(W7.3b) What water-related outcomes were identified from the use of climate-related scenario analysis, and what was your organization's response?

	Climate-related scenarios and models applied	Description of possible water-related outcomes	Company response to possible water-related outcomes
Row 1	RCP 2.6 IEA Sustainable Development Scenario Other, please specify (RCP 4.5, RCP 8.5, IEA CPS; STEPS)	The analysis of climate-related scenarios allows Vale to identify indicators to monitor the external environment and more quickly recognize changes in the scenarios, allowing an agile adaptation to current needs. As the TCFD suggests, in 2020 Vale opted to use the International Energy Agency (IEA) scenarios, which are recognized by the industry and have international backing. In 2020 Vale updated its qualitative analysis of the vulnerabilities and probability of impacts related to climate change in some operations, a work aimed at the long-term, and carried out in parallel to the work by the ITV on climate projections and by the operational areas for the adaptation and better management of water resources. For this purpose, a tool proposed by the Standard Chartered Bank was utilized, which indicates on a map the points most likely to be impacted by climate changes, such as flooding and sea level rise. The analysis uses projections based on IPCC, RCP 2.6, RCP 4.5 and RCP 8.5 Scenarios. The outcomes are related to the new local patterns of precipitation and sea level rise (ports) and flooding.	Vale's immediate response to the possible water-related outcomes identified from the use of climate-related scenario analysis was to incorporate these findings into the Company's risk assessments. In addition, in relation to the survey conducted by ITV that addresses the volume of rainfall that may impact Vale's operations, resilience plans is being developed. These studies are being replicated in other regions of Brazil where Vale operates and also in regions in Canada and Indonesia in a partnership with the University of British Colombia (UBC). The respective project is expected to be completed in 3 years. Vale is still evaluating the outcomes, but the results will be used for decision making, the project being an action plan for mitigation or prevention, for example: expansion of monitoring, engineering works for mitigation. Today we have no set deadline. The idea is that this project will bring immediate actions on the pilot sites, which can then be replicated in other activities of the company.

W7.4

(W7.4) Does your company use an internal price on water?

Row 1

Does your company use an internal price on water?

No, but we are currently exploring water valuation practices

Please explain

We are exploring practices related to water internal price with the objective is to start giving due importance to this input, where only the price it costs the supply water utility is not enough. It is necessary to check its value in all its dimensions (operations and maintenance, administration, regulatory, financial).

W8. Targets

W8.1

(W8.1) Describe your approach to setting and monitoring water-related targets and/or goals.

	Levels for targets and/or goals	Monitoring at corporate level	Approach to setting and monitoring targets and/or goals
Row 1	Company-wide targets and goals Business level specific targets and/or goals Site/facility specific targets and/or goals	Targets are monitored at the corporate level Goals are monitored at the corporate level	Goals are monitored at the corporate level. The Executive Committee assesses the results achieved in relation to short and long-term goals and is also responsible for assessing the Company's sustainability strategy, policies, conduct and performance in relation to Sustainability indicators. The goal was established for the company as a whole and then broken down to each business area, not being the same for everyone, however the value of Vale should be obtained. As a guide to our actions, we rely on the Target Water Program, started in 2018, whose main objective is to reduce the abstraction fresh water for use in our production processes. To this end, Vale invests in the expansion of the monitoring network, in reuse initiatives, in the search for new technologies and in the development of studies. In the same year, we established the 2030 Water Goal to reduce the specific use of water by 10% (base year 2017). By 2020, it had achieved an 8.7% reduction. This goal is part of our 2030 Structural Plan for Water Resources. Its pillars are: Governance (responsible and responsibilities), Technical knowledge (monitoring plan, water balance, water availability and information analysis system), Water risk management, Strategy for responsible water resource management. The main uses of water in mining are for the ore processing, machinery and parts cleaning, environmental controls, hygiene and human consumption. The Target Water Program's main objective is to reduce freshwater withdrawal for use in our production processes, which means lower volume of new water captured for the same production volume. In addition to the main goal of Target Water, the program also invests in the continuous improvement of water resource management to adhere ICMM's principles. All of these strategies are aligned with the Structuring Plan, which is the basis of the Target Water program. Thus, among our main commitments related to the water resource management are: - Manage our operating units' water resources by following the stipulated procedures, with annual frequency and by sampling; - Acquire, install, revise, expand and maintain our water monitoring network through studies and acquisition of monitoring equipment and instruments for measurement and automation; - Identify and make infrastructural projects and executions feasible to improve the management of water resources and effluents; - Map water resources; Keep water balances up to date; Expand the use of the water resources and effluents data management tool; - Establish a methodology for economic valuation of ecosystem services related to water resources; - Map opportunities to optimize water use and reduce water collection for use in the processes through reuse; - Develop and implement effluent treatment systems; - Reduce and/or eliminate losses (evaporation, retained water in tailings, leaks, etc).

W8.1a

(W8.1a) Provide details of your water targets that are monitored at the corporate level, and the progress made.

Target reference number

Target 1

Category of target

Water withdrawals

Level

Company-wide

Primary motivation

Commitment to the UN Sustainable Development Goals

Description of target

Reduction of 10% in new water collection (base year 2017).

Quantitative metric

Other, please specify (Reduce 10% of the water intensity indicator (water use/ton of final product) by 2030, having 2017 as base year.)

Baseline year

2017

Start year

2018

Target year

2030

% of target achieved

87

Please explain

By 2020, Vale achieved a reduction of 8.7% of the 10% established.

W8.1b

(W8.1b) Provide details of your water goal(s) that are monitored at the corporate level and the progress made.

Goal

Other, please specify (Reduce fresh water withdrawal for use in our production processes.)

Level

Company-wide

Motivation

Reduced environmental impact

Description of goal

We manage our water resources by water management practices that provide strong and transparent governance and by effective and efficient management in operations. In addition, we seek to exceed stakeholder expectations in order to promote sustainable water use. As a guide to our actions, we rely on the Target Water Program, started in 2018, whose main objective is to reduce the abstraction fresh water for use in our production processes. In addition to the main goal of Target Water, our main commitments related to the water resource management are: Manage our operating units' water resources by following the stipulated procedures, with annual frequency and by sampling; Acquire, install, revise, expand and maintain our water monitoring network through studies and acquisition of monitoring equipment and instruments for measurement and automation; Identify and make infrastructural projects and executions feasible to improve the management of water resources and effluents; Map water resources; Keep water balances up to date; Expand the use of the water resources and effluents data management tool; Establish a methodology for economic valuation of ecosystem services related to water resources; Map opportunities to optimize water use and reduce water collection for use in the processes through reuse; Develop and implement effluent treatment systems; Reduce and/or eliminate losses (evaporation, retained water in tailings, leaks, etc).

Baseline year

2017

Start year

2018

End year

2030

Progress

To monitor the target, Vale annually monitors the company's total water consumption. So far, 87% of the target set to be met by 2030 has been achieved. See more in the question W8.1a. In addition to the main goal of Target Water, the program also invests in the continuous improvement of water resource management to adhere ICMM's principles. All of these strategies are aligned with the Structuring Plan, which is the basis of the Target Water program. Example of indicators used to monitor the progress of the goals: - How many operational units met the stipulated water resources management procedures, by sampling? - How many infrastructure projects to improve the management of water resources and effluents were carried out during the year? - Were there any reduces and/or elimination of losses (evaporation, retained water in tailings, leaks, etc) in the operational process? In 2020, the consumption reduction target was 1%, but it was not achieved. The COVID-19 pandemic indirectly affected this objective, with the stoppage and reduction of Vale's production in some operations. However the use of water had to remain as it is an intensity indicator. These questions affect the KPI's performance.

W9. Verification

W9.1

(W9.1) Do you verify any other water information reported in your CDP disclosure (not already covered by W5.1a)?

Yes

W9.1a

(W9.1a) Which data points within your CDP disclosure have been verified, and which standards were used?

Disclosure module	Data verified	Verification standard	Please explain
W1 Current state	Water accounting (volumes of water withdrawals, discharges and recycling)	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2020, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2020.
W2 Business impacts	Water-related detrimental impacts experienced by the Company	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2020, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2020.
W4 Risks and opportunities	Number of facilities exposed to water risk	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2020, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2020.
W7 Strategy	Integration of water-related issues into aspects of long-term strategic business plan	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2020, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2020.
W8 Targets	Water-related targets and goals	ISAE 3000	The aforementioned data points were verified as part of the verification process of Vale's Integrated Report 2020, which includes all of the Company's material topics. The external assurance company also provides Assurance Procedure of ICMM - International Council on Mining and Metals and the adherence to the requirements of the International Integrated Reporting Council (IIRC) 2020.

W10. Sign off

W-FI

(W-FI) Use this field to provide any additional information or context that you feel is relevant to your organization's response. Please note that this field is optional and is not scored.

Further information on Vale's approach to water can be found on the following documents:

- Vale's Integrated Report 2020 (http://www.vale.com/brasil/pt/business/reports/siteassets/relato-integrado-2020/assets/docs/vale_integrated_report_2020.pdf)
 - Vale's 20F 2020 (http://www.vale.com/EN/investors/information-market/annual-reports/20f/20FDocs/Vale%20-%20FY2020%20-%20Final%20Version_i.PDF)
 - Vale's Reference Form 2020 (http://www.vale.com/PT/investors/information-market/annual-reports/reference-form/Documents/docs-en/FRE_Vale_2020_i_vf.pdf)
 - Vale's ESG Portal (<http://www.vale.com/esg/en/Pages/Home.aspx>)
- Vale 20-F FY2020 - Final Version_i.PDF
FRE_Vale_2020_i_vf.pdf

W10.1

(W10.1) Provide details for the person that has signed off (approved) your CDP water response.

	Job title	Corresponding job category
Row 1	President Director	Chief Executive Officer (CEO)

W10.2

(W10.2) Please indicate whether your organization agrees for CDP to transfer your publicly disclosed data on your impact and risk response strategies to the CEO Water Mandate's Water Action Hub [applies only to W2.1a (response to impacts), W4.2 and W4.2a (response to risks)].

Yes

Submit your response

In which language are you submitting your response?

English

Please confirm how your response should be handled by CDP

	I am submitting to	Public or Non-Public Submission
I am submitting my response	Investors	Public

Please confirm below

I have read and accept the applicable Terms