



Vale's ESG Webinar

December 11th, 2018

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Disclaimer

Agenda

Update on the resettlement activities in Mozambique

Iron ore tailings dam management

Agenda

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Iron ore tailings dam management

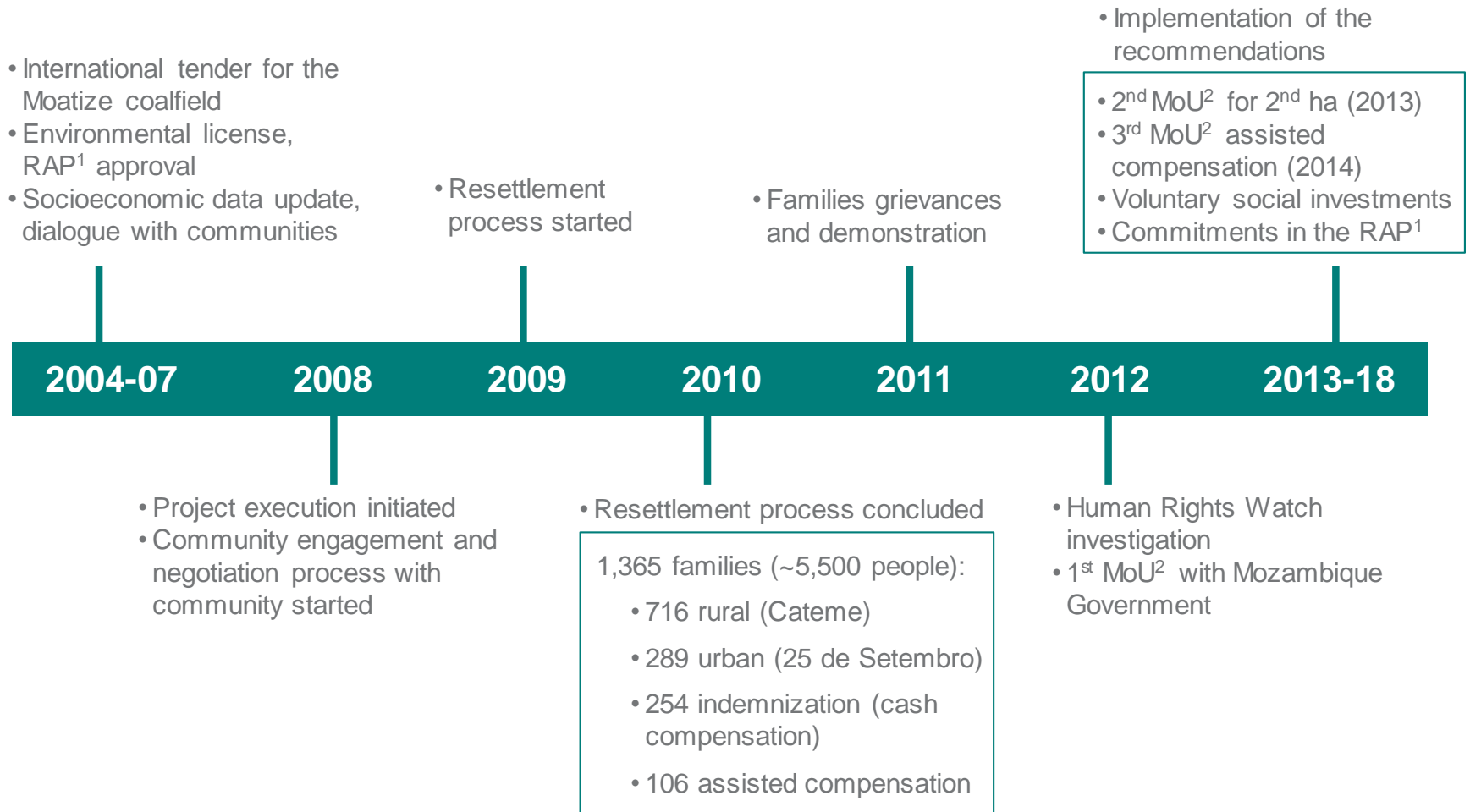
Mozambique resettlement program encompasses three main activities

**Moatize
resettlement**

**Nacala Corridor
resettlement**

**Moatize
encroachment**

In Moatize, 1,365 families were resettled into rural and urban areas



¹ Resettlement Action Plan.

² Memorandum of Understanding.

625 houses were rehabilitated in Cateme and financial indemnity was provided for all 289 houses in 25 de Setembro



- 625 rehabilitated houses in Cateme
- 25 de Setembro:
 - Meetings with residents and local authorities to discuss financial compensation instead of rehabilitation of houses
 - Financial indemnity for all 289 houses
 - Technical assistance for house rehabilitation and financial management

Cateme's families were compensated with land and means to income generation



- Cateme's families received 0.8 hectares of land for residence and 1 hectare of land for agricultural production
- Replacement of the 1st hectare of land for crops (*'machamba'*) for 47 families, in addition to cash compensation for the lost agricultural seasons (US\$ 4,500 per family) in 2017
- Cash compensation for the 2nd hectare of land (US\$ 3,800 per family) in 2014

Water supply system in Cateme was improved and water connections were made at 25 de Setembro



- Water supply system at Cateme:
 - 4 wells
 - 1 water tank of 500 m³
 - 2 water tanks of 40 m³
 - Water supply by 34 fountains
 - 11 km pipeline network
 - 2 dams over the Mualadzi river
 - 287 water rollers in order to facilitate the collection and transportation of water
- Water connection to all houses at 25 de Setembro
- Operation and maintenance by Vale

Mobility challenges and electricity improved through investments



- Construction of 8 km of roads and two bridges
- Restructuring and maintenance of road infrastructures and drainage
- Provision of subsidized buses to connect Moatize and Cateme
- Private operators also provide transport between Moatize and Cateme



- Improvement of electric wiring between Tete - Moatize - Cateme
- Expansion of distribution network in Cateme houses and streets
- Establishment of a management structure of EDM (Mozambique energy company) in Cateme
- Improvement of public electric utilities

Health care infrastructure was implemented in Cateme and 25 de Setembro



- Construction of a Health Center, prenatal house and 2 houses for healthcare professionals in Cateme
- Construction of public pharmacy in Cateme, which the Government is responsible for medicine supply
- Donation of an ambulance to the Health Center of Cateme
- Construction of a Health Center in 25 de Setembro
- Construction of a night clinic in 25 de Setembro

Primary and secondary schools were built in Cateme and 25 de Setembro with capacity for over 2,300 students



Primary school (before)

- Primary school Cateme, built and equipped with capacity for over 1,200 students and boarding school for 300 students
- Secondary school Armando Emilio Guebuza, built and equipped with capacity for over 650 students and boarding school for 270 students
- Primary school rehabilitated and 3 classrooms built for 450 students, in 25/Set



Cateme primary school (after)



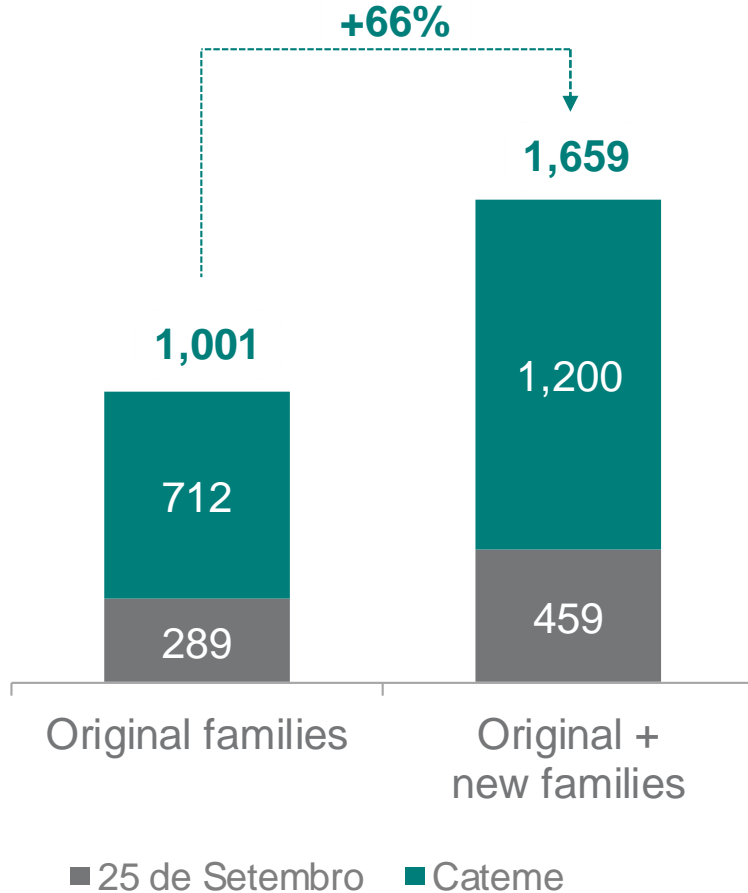
Cateme primary school (after)

More than 2,100 people graduated in professional and income generation trainings



- Professional training: bricklayer, sewing, women entrepreneurs, domestic workers, savings and loans, business management
- Rural capacity training: poultry production, horticulture, fruit farming, beans crops
- Local labor recruitment program and reestablishment of the Moatize Village Labor Center
- Labor market preparation program: 718 young people trained in welding, locksmith, mechanics, informatics, electricity, construction, assembly of metal structures, maintenance of mine equipment
- Portuguese and mathematics leveling program: 132 young people trained, in 2019, 90 positions will be offered to young people

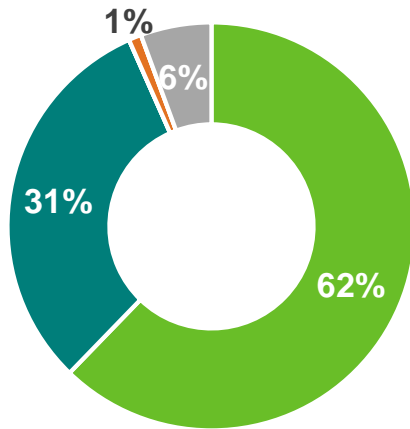
Increase in the number of families residing in 25 de Setembro and Cateme demonstrates community approval



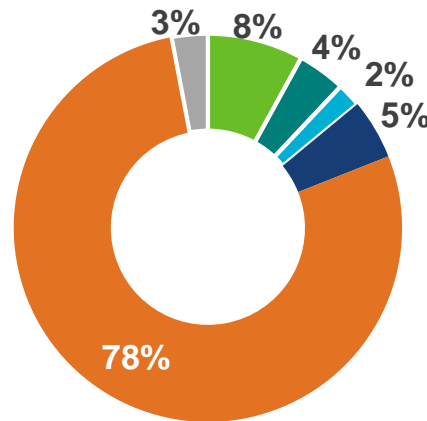
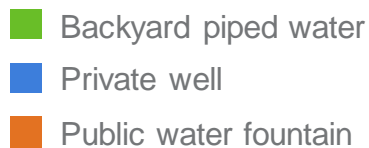
Vale's initiatives improved the quality of life of the communities as shown by the socioeconomic monitoring assessment¹ started in 2017

¹ The final report of this assessment is under review and will be presented to the two communities and to the provincial and district commissions.
Source: Consultec, 2018.

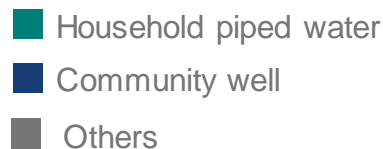
The resettlement improved the water consumed in 25 de Setembro and Cateme regions



25 de Setembro



Cateme



- 94% of resettlement residents in 25 de Setembro and 92% in Cateme have access to improved water
- Indicators are considerably higher than the national average (84% in urban areas and 37% in rural areas)

Note: The final report of this assessment is under review and will be presented to the two communities and to the provincial and district commissions.
Source: Consultec, 2018.

Vale's guidelines for resettlement process were improved after the “Moatize resettlement lessons learned” workshop

- Minimize the number of people to be resettled
- Ensure community and government participation
- Establish permanent grievance mechanisms
- Minimize the rupture of the social network of the resettled and host communities
- Company is responsible from the planning phase until the post-resettlement phase
- Ensure a minimum period of 24 months for post-resettlement, including the livelihood restoration programs
- Promote equivalent or better life quality to affected people, including productive and economic performance conditions
- Respect human rights throughout the whole process and remedy whenever necessary

There were 1,816 physically resettled families along the Nacala Corridor



2010-2011: Environmental Impact Assessment, Formal Public Participation/disclosure and Environmental Licence obtained

2011-2017: Resettlement planning and implementation (1,816 physically resettled families and 13,783 economically displaced families)

2011-2016: Project construction

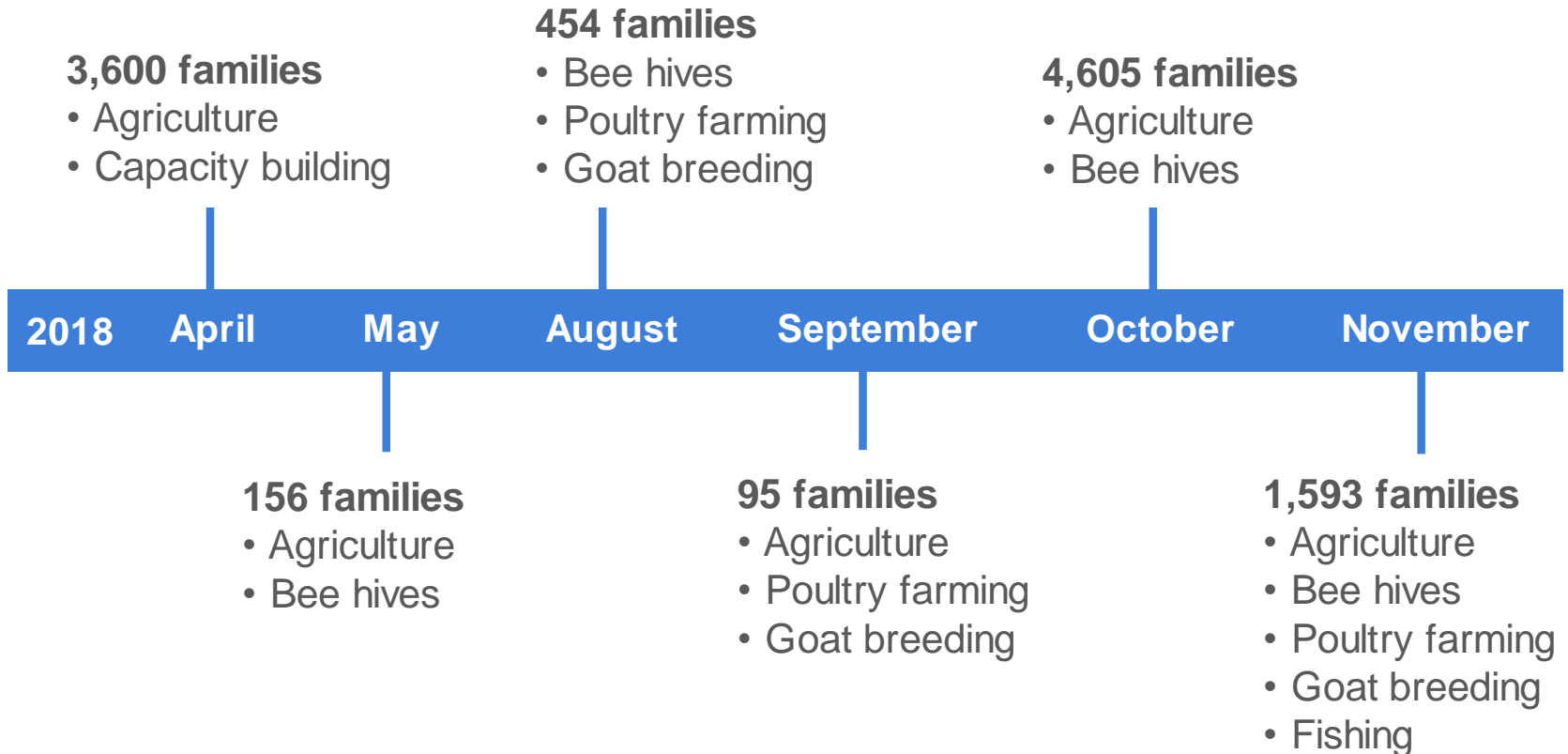
2016: Operation start-up

2012-2018: Community Investment Program

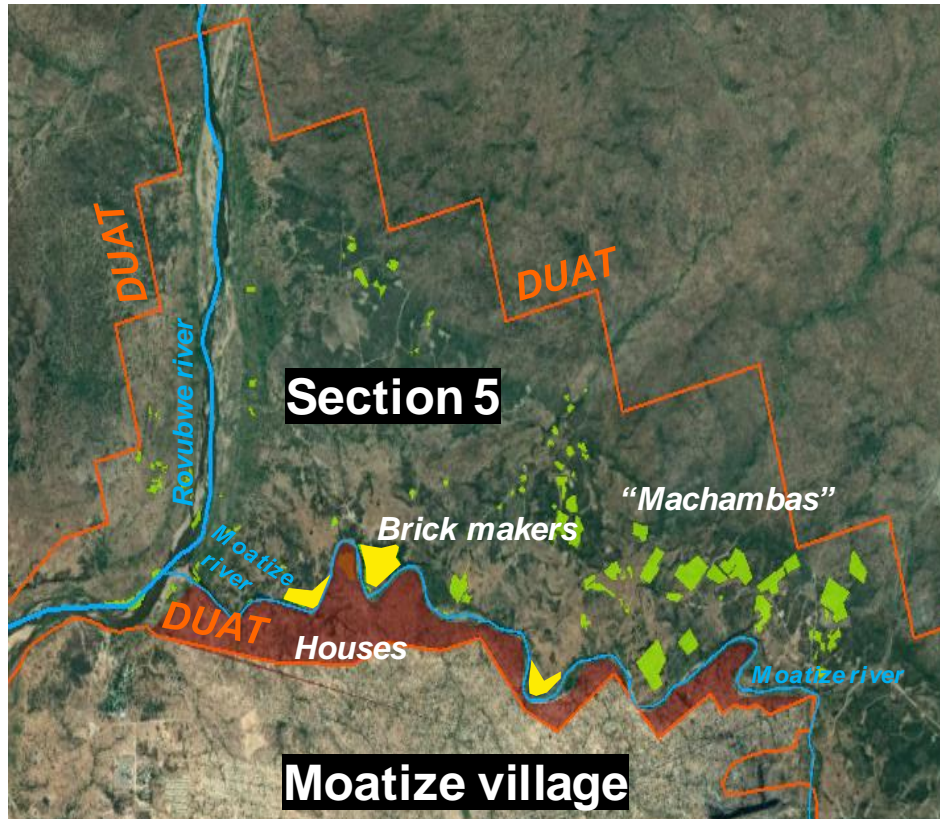
2013-2018: Livelihood Restoration Program (LRP)

2019: LRP and resettlement completion audit

10,500 families along the Nacala Logistics Corridor are benefiting from the Livelihood Restoration Program



Vale has identified an encroachment process in Section 5 of its Moatize mine concession area



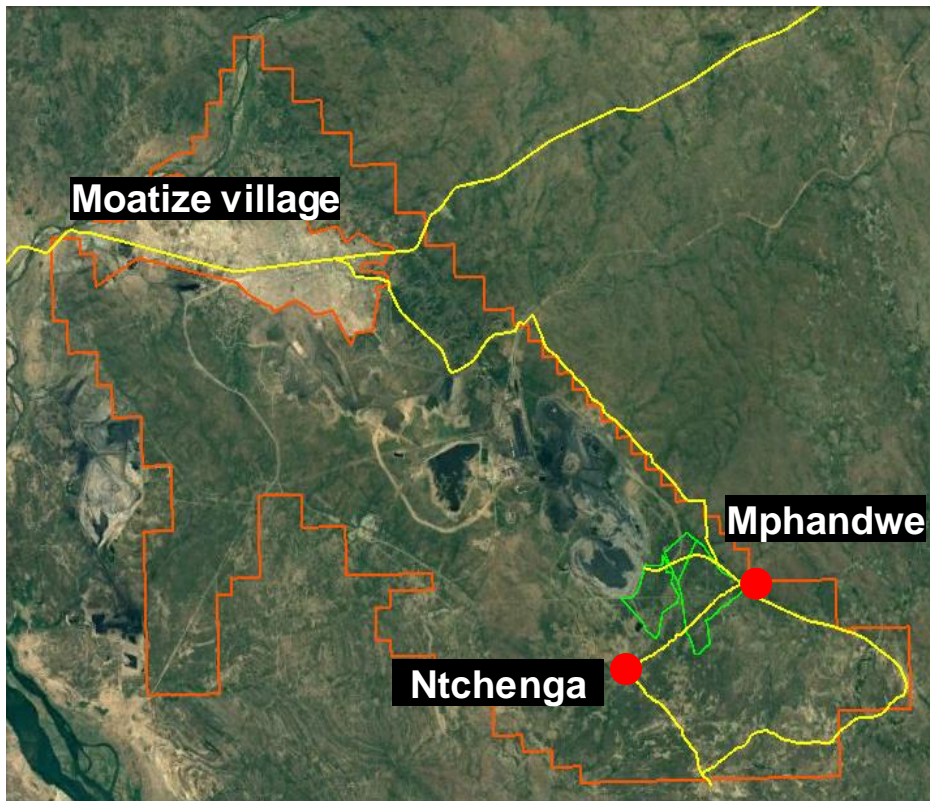
 DUAT² Vale

- 1,532 occupied and 619 unoccupied buildings were mapped
- 1,559 economic activities were identified
- Public meetings to explain the process were held in each neighborhood
- Socioeconomic studies are under development
- RAP¹ likely to be developed in 2019

¹ Resettlement Action Plan.

² DUAT (Direito de uso e aproveitamento da terra): Rights of land use .

Socioeconomic studies are also being developed for communities located within concession borders



● Communities under study

— Roads

□ DUAT¹ Vale

- Approximately 162 buildings identified (Ntchenga and Mphandwe communities)
- Number of families and economic activities to be mapped

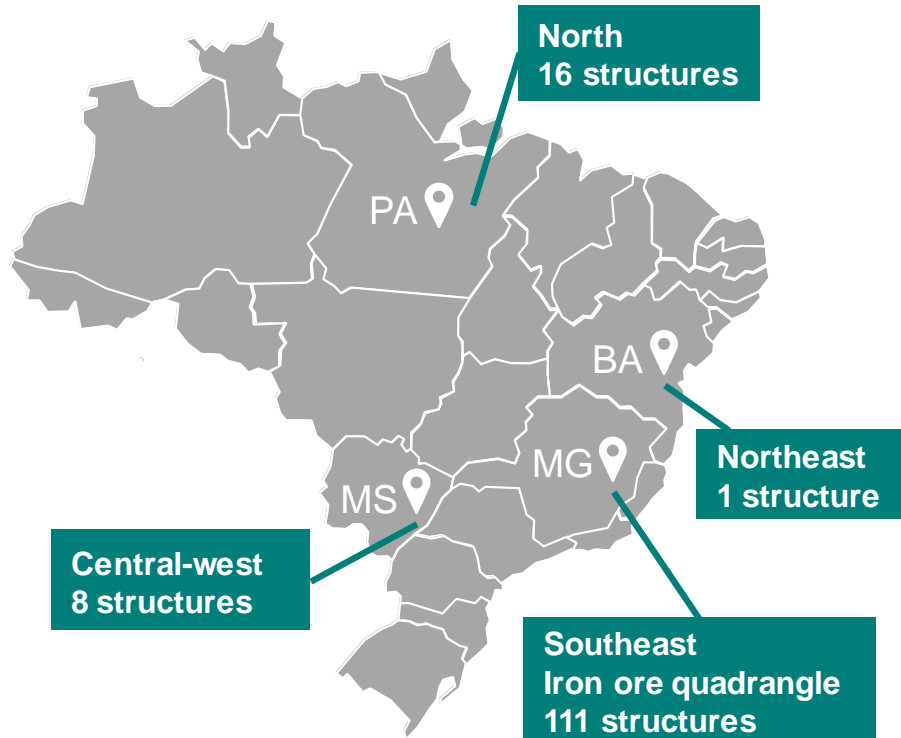
¹ DUAT (Direito de uso e aproveitamento da terra): Rights of land use.

Agenda

Update on the resettlement activities in Mozambique

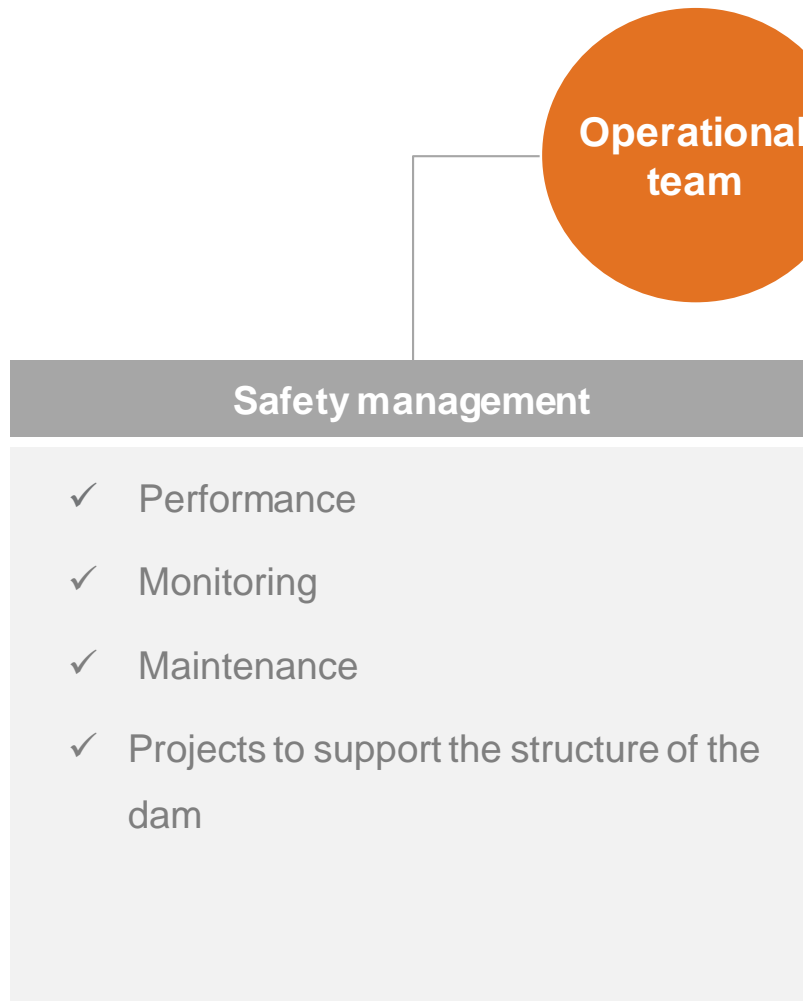
Iron ore tailings dam management

Vale has been reducing its need of iron ore tailings dams



- Our goal is to continuously reduce the number of tailings dams
- In 2018, we reduced our portfolio from 150 to 136 structures

Until 2015, Vale's dam management was decentralized and each department was responsible for the safety of its dams



Since 2016, Vale has strengthened its management system implementing an integrated process based in risk analysis



The new integrated risk management system is based on 3 pillars that support all geotechnical processes



Dedicated and qualified team

- ~130 technicians with masters degree



Processes

- Technical improvements: safety, risk and emergency processes
- Standardization
- Definition of responsibilities
- Integration



IT systems

- Geotec¹ - daily management (inspections and monitoring)
- GRG² - structures database and risk panel and communication

¹ Geotec (Gerenciamento de Geotecnia e Hidrogeologia): Geotechnics and hydrogeology management system.

² GRG (Gestão de Riscos Geotécnicos): Geotechnical risk management system.

In addition to regulatory compliance, Vale works proactively with complementary processes and initiatives

Legal requirements

- Semiannual external audit with DCE¹
- Dam safety periodic performance review with DCE¹
- Emergency action plan and drills
- Integrated and automated monitoring system

Additional improvements

- Risk analysis GRG² methodology
- International panel of experts
- Geotechnical leadership committee
- Internal dam safety cross-inspection
- Support to emergency drills
- Audit all of iron ore dams every three years

¹ DCE (Declaração de Condição de Estabilidade): Stability dam declaration.

² GRG (Gestão de Riscos Geotécnicos): Geotechnical risk management system.

Emergency drills involve public agents, communities and Vale employees



Team assembled at the command post presents details of the drill



End of emergency drill: community, public agents and Vale

- In 2018, there were 9 external exercises carried out in 3 different states: Minas Gerais, Pará and Mato Grosso do Sul
- In 2019, there are 15 external exercises already planned

All of Vale's iron ore dams are safe and operating within normal limits

- 100% of Vale's iron ore dams have their Stability Dam Declaration issued by the External Auditors
- In 2018, all Vale's iron ore tailings dams were audited
- There is a need to continue evolving and taking into account the recommendations of geotechnical risk analysis
- The panels of national and international experts are of great importance and contribute by bringing a critical view on Vale's management model, the methodologies used throughout the process and acting as consultants on safety issues

Q&A

**Save the date:
next Vale's ESG Webinar
March, 2019**



VALE

Appendix I

Moatize resettlement process

Resettlement planning - Moatize

Studies:

- Socioeconomic census
- Territorial characterization
- Qualitative research - emphasis on population dynamics, the family structure and organization
- Assets and crops Assessment
- Conducting study areas hosts - 11 areas studied
- Integrated diagnosis
- Resettlement Action Plan
- Environmental Impact Study

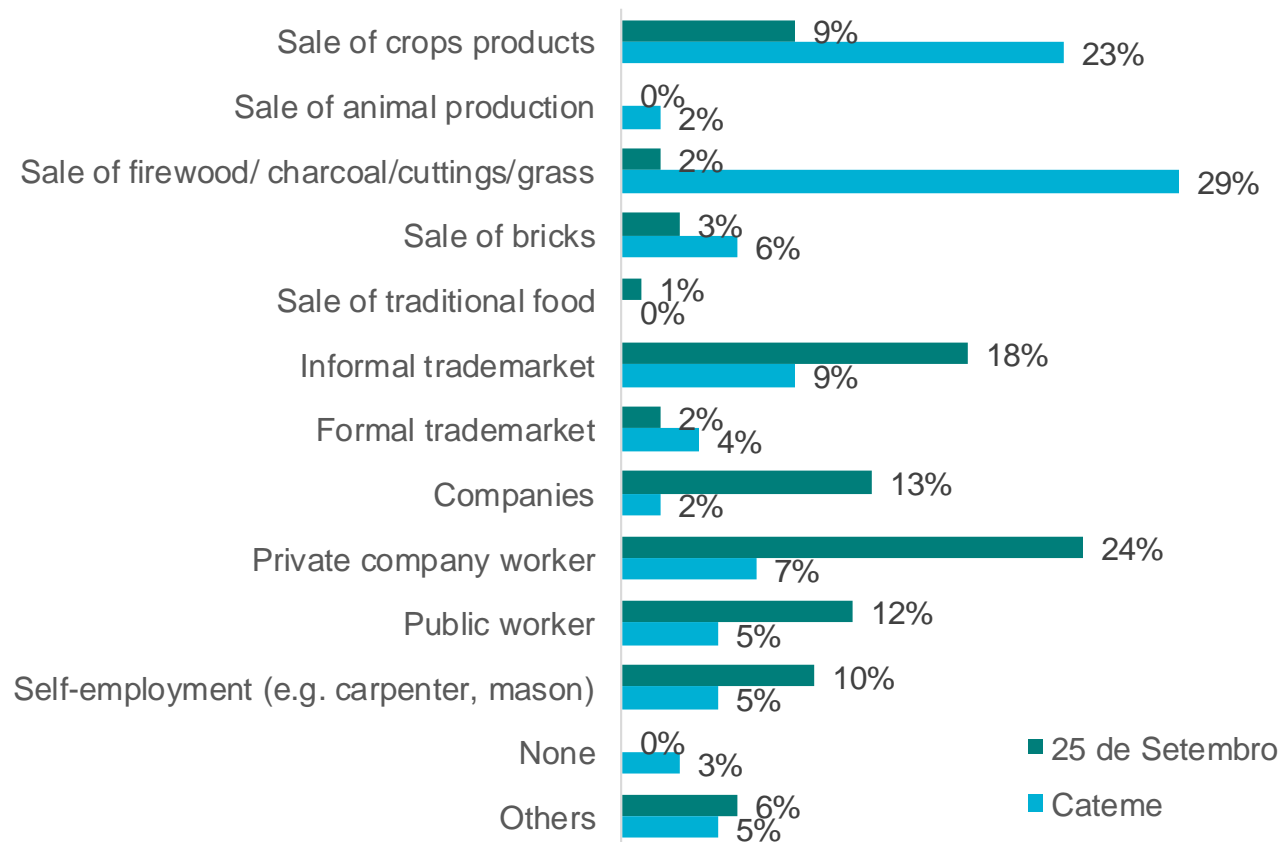
March 2006: Resettlement Commission established, with representatives from Provincial Agencies (Mineral Resources, Environmental Affairs, Public Works and Housing, Agriculture), District Administrator Moatize, President of the Municipal Council of Moatize Village, and the Permanent Secretariat of the Government of Tete who chaired the commission.

Resettlement planning - Moatize

- Based on Community Participation Plan, a series of community meetings in various stages of RAP were made:
 - Qualitative research - **30 focus groups (1,079 households** interviewed)
 - Theater performances were held in the local language (Nyungue) - 41 theater presentations
 - 21 previous meetings with **2,920 people** and their representatives
 - Public hearing: 3 meetings with total 158 participants
 - 44 meetings for presentation of RAP policy
 - Visits to host areas
 - Post of social assistance - **639 people attended**
 - **114 meetings** with Leaders and Communities - 114 meetings
 - Home visits for mobilization and social assistance (families and leaders) - **4,927 home visits**

60% of the population in 25 de Setembro are working on formal activities, while in Cateme mostly are still in rural activities

Main economic activities



Note: The final report of this assessment is under review and will be presented to the two communities and to the provincial and district commissions.

Source: Consultec, 2018.

Presentation of the project of the area where the communities would be moved to and assisted visits to Cateme



Dialogue with the communities



Meetings to present the resettlement process to the community and the leadership



Cateme plots choice



Relocation process - Moatize

The process was initiated in September 2009 and completed in April 2010 and consisted of:

- Mobilization of local leaders and families by meetings and individual sessions on social attendance and / or home visits
- Preparation of families - including transport of livestock to "central corrals" and vaccination
- Transfer of livestock - cattle and goats
- Families and assets moving: output place of origin and receipt at destination
- Release of areas for demolition of the remaining buildings
- Post-Relocation Assistance

To the relocation process and moving it was necessary to make available:

- Social workers to follow up and support the families in both areas (origin and host area)
- Bus to shuttle families
- Trucks to transfer goods, including small animals - pigs, poultry, among others - 1 driver and 2 helpers by truck
- Cages for birds and other smaller animals during the moving
- Mounting structures (corrals) in the areas of origin - for accommodation of animals until the transfer to the new settlement
- Vaccination (prophylaxis) of the flock with Provincial Directorate of Agriculture's support

Moving process - Moatize



Moving process - Moatize



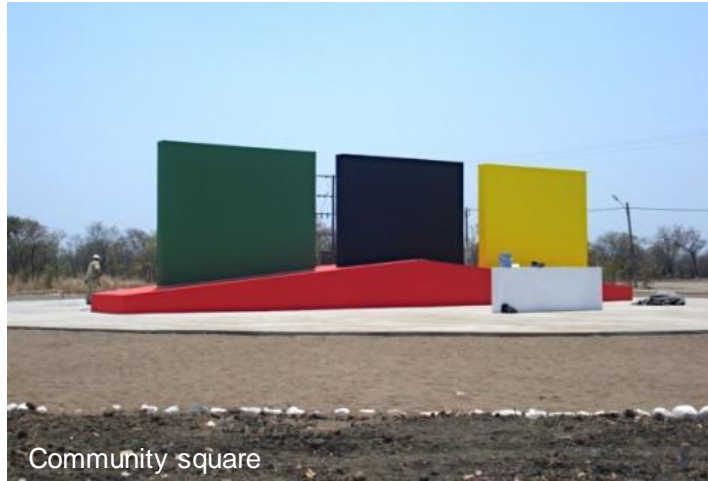
Cateme



Infrastructures improvement



Infrastructures improvement



Food security support for families in Cateme



Model Experimental Farm



Poultry

- Cattle genetics improvement programme, packing house, slaughter house, poultry, horticulture, agricultural trade market in Moatize and Cateme
- Construction of the marketplace in Cateme and 25 de Setembro
- Model Experimental Farm: crops seeds, animal traction, fruit trees programme, poultry, vegetables, rural finance support, nursery garden and feed production for the poultry
- Provision of technicians and work with government agrarian extension agents in assisting families to increase land productivity
- Provision of improved seeds and promotion of income generation crops

Mozambique Government improved legislation on resettlements

Specific legal requirements:

Decree 31/2012: Regulation on the Resettlement Process Resulting from Economic Activities

Diploma 155/2014: Regulation for the Technical Committee for Monitoring and Supervision of Resettlement involving government, non-governmental organizations, communities and Vale

Diploma 156/2014: Technical guidelines and orientations for development and implementation of the Resettlement Action Plan

In addition to:

- Law of the Environment
- Territorial Planning Law
- Directive on the Expropriation Process for Territorial Planning.

Appendix II

Nacala resettlement process

Community hearing – definition and approval of housing project



Nhamitsatse community members at community hearing process. April 2nd, 2014.

Community hearing – definition and approval of housing project



Nhamitsatse community members at community hearing process – April 2nd, 2014.

Traditional ceremony for the beginning of the houses construction



A community elderly woman leading the traditional ceremony.
April 2nd, 2014



Government, CLN and Khembo's Contructions representatives.
April 2nd, 2014

Initial phase of house construction



Construction of Mr. Raúl Chauma house.



Mr. Raúl Chauma working on its building.

Construction works in advanced stage



Ana Karina, CLN's community development analyst, talking to the building technicians.



House under construction at Nhamitsatse community.

Consultation of houses colors

Meeting with the community regarding their choice of their houses colors. July 30, 2014.



Ana Karina, CLN's community development analyst, with Nhamitsatse community leader, Mr. António Mavico.



The houses owners.

Meetings with Government and Commission



Meetings with traditional authorities



Traditional ceremonies



Community hearing



Community hearing



Specific meetings – discussion and negotiation process



Meetings to discuss the compensation with families and local leaders



Explanation about the compensation and reallocations processes.
Participants: community, community leader, government and CLN representatives.

Negotiation process



Explanation about compensation process and alignment regarding deadlines to vacancy the buildings: Mucaia community leader signing the deal.
Participants: community, community leader, government and CLN representatives.

Housing project



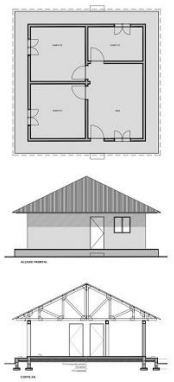
Participative Model

- House design discussed with the community prioritizing local habits
- Indication of plots by families in consensus with district government
- Distribution of the plots by traditional authorities and families
- Indication up to 2 family members to work on building their own home as an apprentice of the contractor

Housing project

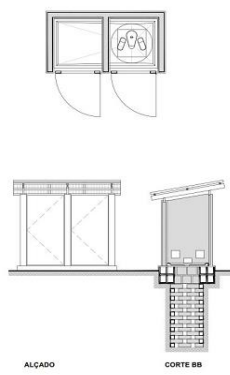
CASA PRINCIPAL

Características
3 quartos + 1 sala
Área Coberta - 76,5 m²



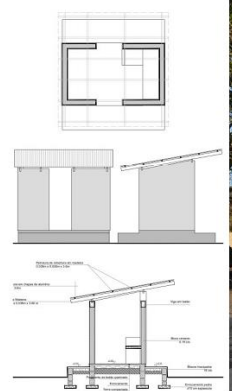
LATRINA MELHORADA

Características
2 compartimentos (1 duchê + 1 rebele)
Área Coberta - 3,5 m²



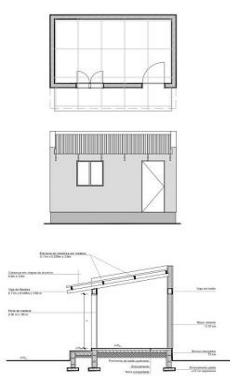
COZINHA

Características
1 área externa coberta para cozinhar
Área Coberta - 11,0 m²



QUARTO EXTRA

Características
1 quarto
Área Coberta - 16,5 m²



Agriculture is one of the most successful activities of the Livelihood Restoration Program in the Nacala Corridor

