



CISVALE

Consórcio Intermunicipal
de Serviços do Vale do Rio Pardo

Regional Project for Climate Resilience, Sustainable Development and Ecosystem Revitalization



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de Serviços do Vale do Rio Pardo



Comitê Pró-Clima
Vale do Rio Pardo

CISVALE is a public consortium comprising 17 cities located in the south of Brazil. Founded in 2005, it aims to represent its members in matters of common interest before public and private entities, focusing on joint management of rural, urban, and socioeconomic development projects and programs across various sectors.

This document was developed by the CISVALE Climate Committee and summarizes the climatic events that impacted the CISVALE region between April and May 2024. It outlines **proposed actions for preparation, recovery, and territorial planning.**





INTRODUCTION

Sininbu, RS, Brazil - Anselmo Cunha (2024)

Climate change poses one of the greatest global challenges today. Each year, its impacts become increasingly evident, directly affecting people's lives and the health of ecosystems worldwide.

In the local context, the cities that are part of CISVALE face vulnerabilities to these events. This region has developed around rivers and slopes, characterized by geophysical features that predispose it to landslides and flooding. Therefore, it is essential to adopt a critical and meticulous approach in formulating a strategic development plan that effectively assesses and addresses current and future climatic conditions at both local and regional levels.

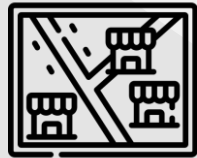
This situation was highlighted by the climatic events from April to May, 2024, which caused flooding, flash floods, and soil movements, resulting in damage and the closure of homes, businesses, services, roads, highways, bridges, and public spaces.

Implementing control and risk mitigation measures for extreme weather events is essential not only for our immediate needs but also as a responsibility to future generations. By adopting integrated strategies and policies, we can minimize our impact on the climate while promoting sustainable development, protecting natural resources, and improving the quality of life and safety for both the population and ecosystems

An aerial photograph showing a severe flood in a rural area. A long concrete bridge with multiple arches spans across a wide, turbulent river. The surrounding land is completely submerged in brown, muddy water. Numerous trees and small islands of vegetation are visible above the water level. In the lower foreground, several houses and buildings are partially submerged, with only their roofs and upper floors visible. The sky is overcast, and the overall scene conveys a sense of environmental devastation.

CLIMATE EVENT APRIL AND MAY 2024

The region experienced hailstorms, strong winds, intense rains, flash floods, and inundations that resulted in destruction, roof damage, and flooding affecting buildings both directly and indirectly. Consequently, this became part of the most significant climate disaster faced by Rio Grande do Sul.



2.411 Km²

total area affected by flooding



PEOPLE



31.829

affected people

- Rio Pardo (25,51%)**
- Vera Cruz (22,26%)
- Candelária (16,71%)
- General Câmara (15,24%)
- Sinimbu (13,71%)
- Venâncio Aires (12,53%)

AGRICULTURE



77,24%

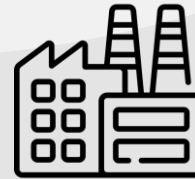
estimated affected area of rice



13,11%

estimated affected area of soybean

BUSINESSES



2.065

affected businesses

INFRASTRUCTURE



12,91%

affected roads

The areas affected by mass movement are not specified | Percentage of people affected relative to the total population of the city
Source: Mapa Único do Plano Rio Grande (Sep., 2024)



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Sinimbu, RS, Brazil – Anselmo Cunha (2024)



Herveiras, RS, Brazil – City's Press Office (2024)



Sinimbu, RS, Brazil - City's Press Office (2024)



Herveiras, RS, Brazil – City's Press Office (2024)



Santa Cruz do Sul, RS, Brazil - City's Press Office (2024)



Venâncio Aires, RS, Brazil - City's Press Office (2024)



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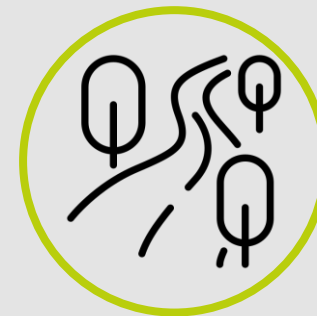
To mitigate these risks, CISVALE, through the **Climate Committee**, has come together to propose regional actions focused on **reconstruction, adaptation and climate resilience**.

To achieve this, a collaborative framework has been established, center around **four key focus areas**.



KEY AREA 1

Climate
resilience and
disaster
management



KEY AREA 2

Water resources
management
and ecosystem
revitalization



KEY AREA 3

Sustainable
Infrastructure
and
Urbanization



KEY AREA 4

Recovery of
arable soils and
sustainable
agriculture



KEY AREA 1

Climate resilience and disaster management

The climate events of 2024 in southern Brazil highlighted the **urgent demand for meteorological and river monitoring systems** that support rapid and effective decision-making, as well as the **pressing need for improvements in the physical structure and equipment for civil defense teams.**





KEY AREA 1

Climate resilience and disaster management

RELATED SDGs



PROPOSED ACTIONS

- Acquisition of flood monitoring and forecasting equipment:
 - Meteorological monitoring stations;
 - Telemetric water level monitoring via interferometric reflectometry stations.
- Disaster response equipment for victim assistance:
 - 187 units of equipment for civil defense, including trucks, boats, electric generators and communication systems.



ESTIMATED BUDGET

U\$ 3.617.807,00 (R\$ 21.252.475,41)



EXPECTED RESULTS

- Obtain information on river levels to support the issuance of early warnings for cities;
- Enhance the hydrological monitoring network and the historical data record;
- Generate a database for future studies on mapping and modeling of the watershed;
- Strengthen the region's safety in facing disasters;
- Reduce response time in assisting victims.



KEY AREA 2

Water resources management and ecosystem revitalization

In the Pardo River watershed, the Pardo and Pardinho Rivers play a vital role in water supply, agriculture, and ecosystem maintenance. The floods of May 2024 have **exacerbated the silting process in these rivers**, compromising their flow capacity. A detailed technical study of these rivers is **essential to understand sediment dynamics and to identify critical points**. Hydrodynamic modeling allows for precise analysis of different scenarios and ensures that future intervention actions are carried out effectively and safely.





KEY AREA 2

Water resources management and ecosystem revitalization

RELATED SDGs



PROPOSED ACTIONS

- Conduct preliminary assessment and diagnosis of critical siltation points and identify priority areas in the Pardo and Pardino Rivers;
- Map priority areas using orthophotos to detail critical points;
- Perform detailed analysis of critical points with topobathymetry to gather depth data and riverbed morphology;
- Acquire orbital images to identify sediment contributions;
- Revitalize riverbanks using natural engineering techniques for stabilization and erosion protection, and restore riparian vegetation.



ESTIMATED BUDGET

US\$ 5.455.992,05 (R\$ 32.026.673,33)



EXPECTED RESULTS

- Accurate diagnosis of critical siltation areas in the Pardo and Pardino Rivers;
- Map of priority areas for efficient planning of future interventions;
- Identification of sediment sources to support future desilting activities and the formulation of management strategies;
- Increased stability of riverbanks, reduced erosion, and improvement of local ecosystems.



KEY AREA 3

Sustainable Infrastructure
and Urbanization

The climate events of April and May 2024 **exposed the vulnerability of cities to flooding**. A detailed study of these climate events is essential for **understanding the mechanisms of flooding and the dynamics of watercourses**. This study will enable the proposal of structural and non-structural actions to reduce the impact of such climate events in the region.





KEY AREA 3

Sustainable Infrastructure and Urbanization

RELATED SDGs



PROPOSED ACTIONS

- Acquisition of high-resolution satellite images (30 cm) for an area of 12,300 km²;
- Hydrological modeling to identify critical flooding points;
- Outlines structural and non-structural solutions to mitigate the effects of floods and droughts in the region;
- Integrate technical studies with environmental assessments to ensure the sustainability of the solutions.



ESTIMATED BUDGET

U\$ 635.296,00 (R\$ 3.736.000,00)



EXPECTED RESULTS

- Hydrological modeling of the watercourses;
- Identification of critical flooding points;
- Technical study to determine structural and non-structural actions aimed at minimizing the impacts of extreme events in the region.



KEY AREA 4

Recovery of arable soils and sustainable agriculture

The occurrence of extreme rains and floods has led to **soil saturation and compaction, significant water erosion, and nutrient loss, compromising agricultural productivity in the long term.** Nutrient levels are below ideal, threatening the livelihoods of farming families and food production. **Conservation actions are necessary to restore soil attributes,** as well as to prevent future erosion and improve the retention of water and nutrients in the soil, promoting sustainable agriculture and ensuring food security.





KEY AREA 4

Recovery of arable soils and sustainable agriculture

RELATED SDGs



PROPOSED ACTIONS

- Diagnose the current soil condition through physical, chemical, and biological analyses;
- Map priority areas using drones to assess soil coverage and condition;
- Install Technological Reference Units for soil conservation techniques and periodic monitoring;
- Provide technical assistance to producer groups for implementing soil conservation practices.



ESTIMATED BUDGET

U\$ 319.335,76 (R\$ 1.878.468,40)



EXPECTED RESULTS

- Increase in protected agricultural area;
- Reduction of soil water erosion;
- Improvement of soil productive capacity;
- Sustainable agriculture;
- Increase in the quantity and quality of water;
- Decrease in the effects of droughts and the impact of floods.



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