



MORRO DA CRUZ

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GUIDED BY DATA: CIRCULAR PROJECTS IN MORRO DA CRUZ COMMUNITY – PORTO ALEGRE, BRAZIL

The vulnerable community of Morro da Cruz in Porto Alegre City, Brazil, is transforming a community center and local schools into hubs for environment-based circular economy. The initiative uses data from community based assessments and Google's Environmental Insights Explorer (EIE), to inform decision-making and to up-scale or even replicate this model in other schools and areas in Porto Alegre City.

Facts and figures

Local Government Name

Porto Alegre

Population

1.49 million (2021), 0.28% (2016) [1]

Total area

495,390 km² (2021)

Municipal Budget

€1.79 billion (2022) [2]

GHG inventory available since

2015, updated in 2021 using 2019 data [3]

GHG emissions indicator

2,373,000 tonnes of CO₂e

Introduction

As local governments develop strategies to tackle climate change, it is increasingly apparent that decision-making based on accurate data is essential. Local governments need to understand how to adapt to known and anticipated climate change impacts in their cities, as well as know how to proactively avoid and drastically reduce greenhouse gas emissions, while enhancing the resilience of the whole community. The reliability of the data sources used is key, especially considering these influence decisions, policies, and their expected outcomes over time. Data is needed to inform robust community-wide greenhouse gas emission inventories (ideally based on the Global Protocol for Community-scale GHG Inventories and making use of notation keys) and climate risk and vulnerability assessments (CRVAs), as well as setting clear targets with a baseline - these are core components of effective climate change policy, planning, and implementation [4].

As an impoverished community located on the periphery of the capital of Brazil's southernmost state, Morro da Cruz - with 30.000 inhabitants - has been the focus of multiple programs addressing poverty and inequality to enable progress. Through lessons learned from these programs and their varying levels of success, the Morro da Cruz Circular project aims to create circular economy hubs in the community. In doing so, relevant data for policy makers is gathered to support informed and more impactful decision-making for the community. The project's goal was to show the transformative potential of renewable energy and inclusive

circular economy in vulnerable territories, by applying a combination of technology, socio-environmental education, and systematic, but also participatory, data-driven approaches.

This case study presents the development of the Morro da Cruz Circular project in its local context, engaging the Porto Alegre coalition which is led by the Urban Intelligence Center (CIUPOA). It focuses on the importance of engaging both the local government and the community to ensure successful implementation. It also highlights some of the challenges and opportunities encountered during its initial implementation and in the development of proof of concept. The project was selected and funded by the Action Fund Brazil, a climate action fund based on the partnership between ICLEI South America Secretariat and Google.org, during the period of December 2020 to June 2022.



Project Team, ICLEI and school directors handing in the Proof of Concept to Porto Alegre's Secretary of Education at EMEF Morro da Cruz. ©Gisele Medeiros

I am very proud of this project and this partnership with ICLEI and Google. We are very grateful for the opportunity to finance a project of this magnitude. It is very symbolic that we are in a municipal public school, where we have children who are the future of our planet, being able to visualize a project that actually changes the entire energy matrix of the city of Porto Alegre. I think this is a concrete example, and we hope to replicate it.

Germano Bremm

Secretary of Environment, Urbanism and Sustainability of Porto Alegre



The Community and Its Challenges

The community of Morro da Cruz is situated in the southern part of Porto Alegre, directly adjacent to a large undeveloped wooded area. Over recent decades, the number of informal settlements increased, and with it associated problems. Lack of basic sanitation and infrastructure led to intense environmental degradation within the region. This negatively impacted the population, and led to a general expansion of the community into previously unoccupied areas.

While there are many issues to be dealt with, CIUPOA, together with different partners such as Google.org, ICLEI South America Secretariat, CincoMarias, ViaVerde Energy, Daniely Votto Consultancy, Pyxera Global and Metabolic, identified three underlying but actionable challenges affecting the Morro da Cruz community and the surrounding Porto Alegre:

CHALLENGE 1: Energy Dependence

Despite huge potential for generating energy from solar [data from Google Environmental Insights Explorer (EIE)] and energy derived from organic waste, Porto Alegre has only about 2,350 photovoltaic (PV) systems connected to the power grid [5] (ANEEL, 2022), while biodigester technology is not currently used much.

CHALLENGE 2: Landfills, Illegal Dump Sites, and Waste Transport

Over the past three years, Porto Alegre has spent over R\$30 million (Brazilian real) to transport more than 40 thousand tons of waste every month to the landfill located 90 km away in Minas do Leão. Additionally, Porto Alegre spends R\$1,800,000 per month to remove solid waste from the 318 illegal dump sites scattered throughout the city's periphery on both private and public land [6] (Source - Municipal Department of Urban Cleaning).

CHALLENGE 3: Need to Strengthen Community Network and Education

Although the community has high levels of socio-environmental vulnerability, there are no environmental education programs focused on local issues in the Morro da Cruz community. Compounding this issue, local networks are still on tenuous terms regarding prioritizing representation of residents before those of outside partners, including the Porto Alegre City Hall (PMPA).



Insights in the Morro da Cruz Circular Project

As seen in previous projects, without the support and engagement of the community, sustained positive outcomes are impossible to achieve. Gaining support can only be realized when targets or goals are relevant, transparent, and meaningful to the affected stakeholders.

Realizing these factors, CIUPOA designed the Morro da Cruz Circular project with two main components:

1 Turn two municipal schools and a local Gaucho Traditions Center (CTG) into circular economy hubs by promoting the transformative potential of renewable energy in (and to serve) the community.

2 Use Google's EIE with data on energy, resource usage, and organic waste production to enable well-informed decisions by Porto Alegre City Hall that will benefit the citizens of Morro da Cruz.

Normally, neither the schools nor the CTG collect all the necessary data or the suitable level of detail to complement the data provided by the EIE. To address this, there was a dedicated effort to educate and inform the directors of the three institutions about the importance of thorough and comprehensive data collection and reporting. The data produced over the project lifetime is invaluable for the decision-making processes at city hall and for future plans to implement this approach in all schools in the city.

To complement these actions, the project also includes environmental education on circular economy principles, using Circular Vision Workshops with the school community and local leaders. In these workshops circular economy goals are co-defined, with baselines identified by combining gathered data and setting key performance indicators (KPIs) to be monitored and track progress towards achieving the shared vision. Through funding from the Action Fund, a partnership between ICLEI and Google.org, Morro da Cruz Circular has been able to participate in this study further, to evaluate the project impacts and methodology used. This is part of an ongoing effort to foster data driven environmental and climate action at the local level.



Circular Vision Workshop with the school community at EMEF Judith Macedo de Araújo. © Natacha Gastal



Circular Vision Workshop with the school community at EMEF Judith Macedo de Araújo. © Natacha Gastal

The Morro da Cruz Circular Project was explicitly designed as proof of concept for future expansion into other areas or communities. With slight modifications, depending on the local context, the impact of this project and the transformative potential of its renewable energy component can further empower local stakeholders in other

vulnerable communities. A valuable co-benefit of this action is enabling access to and promoting open data, its use and importance when measuring impact and improving decision-making, making these more aligned with public sustainability policies for all community members.

Impacts

As this Circular project progressed since its inception in August 2020, the contributions benefitting Morro da Cruz started to materialize. Recalling the aforementioned challenges, these are some of the impacts the projects has had:

IMPACT 1: Energy Dependence

At the school level, by installing solar panels and combined with Porto Alegre City Hall's action to replace inefficient light bulbs with LED lamps, electricity consumption has already decreased over 50% in each school, and associated electricity costs reduced by over 93% [7].



*PV System at EMEF Judith Macedo de Araújo.
©Anselmo Cunha, RBS Agency*

IMPACT 2: Waste Management

Additionally, using data for food waste and school supplies has allowed the schools to avoid unnecessary waste and the misuse of resources through conscientious and data-driven planning. This helped to reduce the schools' carbon footprint while educating students.

The installation of biodigesters led to biogas production, reducing energy costs in the operation of kitchens. In addition, biofertilizers were an excellent for use in the vegetable gardens and orchards. Educational workshops in both schools were organized on developing organic orchards and using compost. According to Fernanda Scur, member of the project's implementation team, such education has had a snowball effect, as, once this knowledge is brought home and disseminated throughout the community, it would lead to further adoption and implementation.

IMPACT 3: Stakeholder involvement

Due to CIUPOA's local work and interactions with the community and schools for several years, stakeholders were open to the changes proposed by the project, engaging and personally investing in the success of the project. Fostering this relationship throughout the years contributed to enhancing the local community's trust in CIUPOA's intent, leading to greater acceptance of the importance of renewable energy, waste reduction, education, and the positive effects these actions can have on the community and the environment.

While it can be difficult to shift the culture and mindset of community members towards sustainable goals, the successful implementation of this project was due to community engagement through dialogues with students, politicians, and households. The main benefit of the data gathered from the field analysis derived from workshops, helping to inform on the daily issues negatively impacting the attendees' livelihoods. Through the workshops and discussions with attendees, a better understanding of the challenges faced by the local stakeholders



Kids using the biodigester at the CTG Estancia Pasqualleto. © Morro da Cruz Circular project files



Circular Vision Workshop with the school community at EMEF Judith Macedo de Araújo. © Natacha Gastal

"The existing relationship of the NGO with the local community was crucial in gaining the trust of the stakeholders."

Fernanda Scur
Project Leader on Data and Circular Economy Interventions

and schools helped to set the scene. This in turn informed the selection of relevant, appropriate, and impactful solutions.

It is important to note that the City Hall was kept informed and engaged (close to the project) through the local Secretary of Environment and Education. This was essential to overcome bureaucratic hurdles and to ensure the results were co-owned by local policy-makers.

Openly sharing the data and results achieved with and through City Hall, ICLEI and politicians, showcased successful stakeholder involvement of this project.

Based on the mid-term impacts achieved during project implementation, the Municipality of Porto Alegre publicly announced structuring a tender process to expand the use of biodigesters and expand an existing PV project to all of its public schools.

Lessons Learned

While a decision-making process that involves key stakeholders is a recommended way forward, it can especially empower a vulnerable community. Yet, it remains challenging to accommodate all views and perspectives. As an example, a teacher felt that rainwater harvesting was more important than installing PV for electricity, and was dismayed at not being included in the initial phases of project design. To overcome this situation, a conversation was held between interested parties to explain the process of proposal writing and that not all stakeholders could be engaged at the very beginning of these processes. This triggered a process of prioritizing challenges, and subsequently developing plans to overcome these. After building trust, the water issue became an important indicator, and, as a result, the project is also assisting the teachers in planning an intervention - which may involve writing an additional proposal for another fitting bid.

Field analysis is an essential precursor to ensure that the most relevant interventions are prioritized according to the greatest needs of the local community.

Most of the local stakeholders are not familiar with the immense value of the data being gathered for this project. They also do not fully understand how climate change impacts their daily life in the city. The data collection process itself already led to a great reflection by school directors and staff

about resource usage and waste. Translating the data into user-friendly information and showing the daily impact in a way that was easier to understand was essential to guarantee their interest and co-ownership.

Inter-organizational communication needs to be better understood and effectively implemented to avoid future delays. Involving teachers and students, not only senior staff, was crucial for the sustainability of the project. This should be addressed from the initial phase, to avoid alienating important stakeholder groups at the start.

"When it is not possible to involve all community stakeholders from the beginning, extra care must be taken to ensure cohesion, form trust, and foster respect and ownership."

Fernanda Scur
Project Leader on Data and Circular
Economy Interventions

**As of the publication of this study case, the proof of concept developed by "Morro da Cruz Circular" Project was already finished and publically available in Portuguese at ICLEI South America's website, with its main results, findings and recommendations. [Click here](#) to discover more.*

References

- [1] Brazilian Institute of Geography and Statistics. Available at <https://www.ibge.gov.br/cidades-e-estados/rs/porto-alegre.html>
- [2] Porto Alegre City Hall, 2021. Available at <https://prefeitura.poa.br/smpae/noticias/aprovada-lei-orcamentaria-anual-2022>
- [3] GHG emissions Inventory of Porto Alegre. ICLEI South America, Way Carbon, Ecofinance and Porto Alegre City Hall, 2021. Available at: <https://americadosul.iclei.org/documentos/inventario-de-emissoes-de-gases-de-efeito-estufa-de-porto-alegre/>
- [4] From Climate Data to Climate Action: Experiences From The City of Boulder, Colorado, USA. Available at: <https://iclei.org/wp-content/uploads/2022/04/Boulder-case-study.pdf>
- [5] ANEEL - National Agency of Electric Energy, 2022. Database of distributed generation units. Retrieved from: https://dadosabertos.aneel.gov.br/pt_BR/dataset/relacao-de-empreendimentos-de-geracao-distribuida/resource/b1bd71e7-d0ad-4214-9053-cbd58e9564a7 (Accessed in July 12, 2022)
- [6] Municipal Department of Urban Cleaning of Porto Alegre (Departamento Municipal de Limpeza Urbana (DMLU), Prefeitura de Porto Alegre)
- [7] School EMEF Morro da Cruz 2022 energy bills

About the Action Fund

The Action Fund is an initiative led by ICLEI with support from Google.org, to boost environmental projects in selected cities in Europe, Mexico and South America. The grant aims at empowering civil society organisations, academic institutions and nonprofit research institutes, leading data-driven climate action efforts to reduce citywide emissions.

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