



## **SUSTAINABLE AND RESILIENT DEVELOPMENT ACTIONS: AN EXPERIENCE OF PARTICIPATION AND COLLABORATION**

*Ações de desenvolvimento sustentável e resiliente: uma experiência de participação e colaboração*

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### **ABSTRACT**

Studies report that 85% of the Brazilian population lives in large urban centers, so cities must prepare to deal with this reality and possible adversities. This article describes the experience of the Municipality of Veranópolis in the State of Rio Grande do Sul, Brazil, with the Project “Garbage is your responsibility”, foreseen in the Veranópolis Resilient City Program. The research method is applied in nature, with a descriptive objective and a qualitative approach. The technical procedure used was field study. The Project aimed to improve knowledge about the separation and correct disposal of solid waste and promote a culture of environmental preservation. To this end, we invited six Municipal Schools and two Private Schools, professionals from the public and private sectors and non-governmental organization, totaling more than 3,000 participants, for a period of five months. The results show that the implementation of the Project achieved the participation and collaboration of all those involved. In addition to the engagement of students, teachers, families and the community in the delivery and receipt of teaching materials and the correct disposal of waste.

Keywords: Sustainable Development Goal, Risk Reduction, Solid Waste.

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## ACÇÕES DE DESENVOLVIMENTO SUSTENTÁVEL E RESILIENTE: UMA EXPERIÊNCIA DE PARTICIPAÇÃO E COLABORAÇÃO

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### RESUMO

Estudos relatam que 85% da população brasileira vive em grandes centros urbanos, por isso as cidades devem se preparar para lidar com essa realidade e possíveis adversidades. Este artigo descreve a experiência do Município de Veranópolis, no Estado do Rio Grande do Sul, Brasil, com o Projeto "O lixo é sua responsabilidade", previsto no Programa Cidade Resiliente de Veranópolis. O método de pesquisa é de natureza aplicada, com objetivo descritivo e abordagem qualitativa. O procedimento técnico utilizado foi o estudo de campo. O Projeto teve como objetivo aprimorar o conhecimento sobre a separação e destinação correta dos resíduos sólidos e promover uma cultura de preservação ambiental. Para tanto, foram convidadas seis Escolas Municipais e duas Particulares, profissionais dos setores público e privado e organizações não governamentais, totalizando mais de 3.000 participantes, por um período de cinco meses. Os resultados mostram que a implementação do Projeto contou com a participação e colaboração de todos os envolvidos. Além do engajamento de alunos, professores, famílias e comunidade na entrega e recebimento de materiais didáticos e no descarte correto dos resíduos.

Palavras-chave: Objetivo de Desenvolvimento Sustentável, Redução de Riscos, Resíduos Sólidos.

## INTRODUCTION

In September 2015, world leaders and civil society representatives met at the United Nations (UN) headquarters in New York, United States. To decide on an action plan to eradicate poverty, protect the planet and ensure that people achieve peace and prosperity. This plan, known as the 2030 Agenda for Sustainable Development, resulted in the creation of 17 Sustainable Development Goals (SDGs) and 169 targets to promote a decent life for all (United Nations, 2015a).

Brazil has made a commitment to disseminate and achieve the goals and targets established by the 2030 Agenda, since the impact of climate change represents a crucial issue for the future of the country, which is home to the greatest biodiversity on the planet. According to the United Nations Development Programme, protecting natural resources from the effects of climate change is protecting the planet for future generations (UNITED NATIONS DEVELOPMENT PROGRAMME, 2023).

The country also committed to the Sendai Framework for Disaster Risk Reduction (2015-2030), which was adopted at the Third United Nations World Conference in Sendai, Japan. The Framework presents a number of innovations, with an emphasis on disaster risk management, prevention and reduction, as well as strengthening resilience in countries (UNITED NATIONS, 2015b).

Through Law 12.305/2010, Brazil institutes the National Solid Waste Policy, providing for its principles, objectives, and instruments, as well as guidelines for integrated management and solid waste management (FEDERAL PUBLIC MINISTRY, 2023). The generation of solid waste in Brazil reached a total of 81 million tons in 2022, which corresponds to 224 thousand tons per day. As a result, each Brazilian produced, on average, one kilogram of waste per day (Brazilian Association, 2022).

Regarding solid waste collection, in 2022, the country recorded a total of 76 million tons collected, leading to a coverage of 93% of municipalities. In 2021, the number of municipalities that presented a selective collection initiative was 4,183, representing 75% of the country's total. With the adhesion of more Reverse Logistics Programs, there was an increase in the recovery of recyclable waste, reaching approximately 4% in 2022 (BRAZILIAN ASSOCIATION, 2022). But the number is still insignificant, given the rate of European Union countries, which is around 40% (EUROPEAN ENVIRONMENT AGENCY, 2023).

In order to advance waste management, the country adopted the 3 R's of Sustainability methodology: 1) Reduce; 2) Reuse; and 3) Recycle, which emerged during the Earth Conference, held in Rio de Janeiro, in 1992. The methodology provides for actions that minimize the environmental impact caused by the waste of materials and products from natural resources, in addition to sparing nature from the inexhaustible extraction of resources (United Nations, 2023a). And it expanded to the policy of the 5 R's, which aims to change behavior from the individual to the collective, with regard to environmental awareness, with the inclusion of the term rethink and refuse (Johnson, 2013).

In line with the Sustainable Development Goals, Sendai Framework and the 5 R's of Sustainability policy. The Municipality of Veranópolis is committed to becoming a Resilient City, in order to raise awareness among citizens about the importance of resilience and carry out actions aimed at reducing risks and disasters. The Veranópolis Resilient City Program has developed an action plan with the ten steps outlined by the United Nations International Strategy for Disaster Reduction (UNITED NATIONS OFFICE FOR DISASTER RISK REDUCTION, 2023).

Among the ten steps, it is worth highlighting the action of the eighth step: Environmental protection and strengthening of ecosystems. Due to a series of climate evidence and reports that point to a situation in which periods of abrupt changes are expected to become more present, increasing both in frequency and magnitude.

In this way, the Project "Waste is your responsibility" emerged, which aimed to improve knowledge about separation and correct disposal of solid waste, and promote a culture of environmental preservation. We need to invest in actions that help in the development of society and in the protection of the environment, changing our patterns of production, consumption and disposal, together with the fundamentals of sustainability and resilience.

## 1 THEORETICAL FRAMEWORK

### 1.1 2030 Agenda

The Sustainable Development Goals (SDGs) emerged in 2015 to continue the Project Millennium Development Goals (MDGs), which consisted of eight goals to be achieved between the years 2000 and 2015. Encouraged by the success of the MDGs, the member countries of the United Nations decided in the General Assembly to create new goals for the following fifteen years, from 2015 to 2030, which they denominated the 2030 Agenda (UNITED NATIONS, 2015a).

The 2030 Agenda for Sustainable Development resulted in the creation of 17 Sustainable Development Goals (SDGs), namely: 1) Poverty eradication; 2) Zero hunger and sustainable agriculture; 3) Health and well-being; 4) Quality education; 5) Gender equality; 6) Clean water and sanitation; 7) Affordable and clean energy; 8) Decent work and economic growth; 9) Industry, innovation and infrastructure; 10) Reduction of inequalities; 11) Sustainable cities and communities; 12) Responsible consumption and production; 13) Action against global climate change; 14) Petticoat life; 15) Terrestrial life; 16) Peace, justice and strong institutions; and 17) Partnerships and means of implementation (UNITED NATIONS, 2023b).

These objetivos has mobilized reflections and strategies on the need to build resilient cities with the capacity to recover from disasters and sustainably adapt to changes. It has been a priority theme worldwide because in order to become sustainable, a city must become resilient or enhance manifestations of resilience. To this end, urgent action is key to achieving the SDGs of the 2030 Agenda and the Sendai Framework for Disaster Risk Reduction.

### 1.2 Sendai Framework

The Sendai Framework is the successor instrument to the Hyogo Framework for Action, which aimed to build the resilience of nations and communities to disasters between the years 2005 and 2015. For the next 15 years, from 2015 to 2030, United Nation Member States have adopted seven targets, four priorities and a set of guiding principles for substantial disaster risk reduction, which they have denominated the Sendai Framework for Disaster Risk Reduction (UNITED NATIONS, 2015b).

Taking into account the experience gained through the implementation of the Hyogo Framework for Action, and in pursuance of the expected outcome and goal, there is a need for focused action within and across sectors by States at local, national, regional and global levels in the following four priority areas: 1) Understanding disaster risk; 2) Strengthening disaster risk governance to manage disaster risk; 3) Investing in disaster risk reduction for resilience; and 4) Enhancing disaster preparedness for effective response and to “Build Back Better” in recovery, rehabilitation and reconstruction (UNITED NATIONS, 2015b). Among the priorities, the third guided the planning of the Project proposed in this research.

### 1.3 The 5 R's of Sustainability

In 1992, the United Nations Conference on Environment and Development in Rio de Janeiro, better known as Rio 92. Event where the first formal references of the 3 R's of Sustainability Policy emerged, as basic attitudes in the practice of saving resources, reusing usable materials and recycling materials (UNITED NATIONS, 2023b), namely:

Reduce consists of actions that reduce the consumption of goods and services, aiming to reduce the generation of waste. The reduction should encompass both the use of products and the rationing of resources, such as water, energy and fuels, practices that have a positive impact on the economy and reflect on the minimization of damage caused by the generation of waste and pollution of the environment (Scott, 2007).

Reuse is understood as a more efficient use of resources with the aim of reducing their depletion as much as possible. Reuse as much as possible before discarding and create new alternatives. Future waste management programs should maximise control approaches based on resource yield (Scott, 2007).

Recycling involves the processing of materials through their physical or chemical transformation, usually in the form of raw materials for the production of new products and consumer goods. A recyclable product must be disposed of correctly for selective collection, which will dispose of the materials to the correct places (Scott, 2007).

The passage from the 3 R's to the 5 R's policy aims at an environmental awareness, with behavioral changes in order to ensure quality of life and environmental preservation, including man as an integral part of the environment. The creation of the 5 R's policy aims to change behavior from the individual to the collective, with regard to environmental awareness, with the inclusion of the term rethink and refuse (Johnson, 2013).

Rethinking means reflecting on the socio-environmental processes of production, from raw materials, through working conditions, distribution, and disposal. Rethinking the real need for consumption to our habits means exerting social control over the production and consumption chain (Johnson, 2013).

Refusing is understood as avoiding exaggerated and unnecessary consumption, purchasing only essential products. Refuse products that cause harm to the environment and/or our health. For Johnson (2013), when products that harm health and the environment are refused, we contribute to a cleaner world. This methodology was used in the execution of the Project.

#### **1.4 Veranópolis Resilient City Program**

We live in time characterized by the speed and breadth of technological, social and economic transformations. This dynamic requires a great capacity to adapt to the changes taking place, both from individuals and institutions. Sometimes, changes can occur gradually, where the impacts move more or less continuously and predictably. In other cases, change is sudden, disorganized and turbulent, projecting profound impacts on daily life, imposing strong challenges on the most vulnerable regions of the globe or prone to natural disasters.

Resilience is a process in which communities collectively respond to significant events, using various coping and adaptive capacities. It is an essential aspect of risk management for guiding individuals in developing preventive measures and promoting resilient communities to cope with adversity (Spialek, Czapinski, Houston, 2016).

We observed that the Municipality's first challenge was to develop a resilient culture. To this end, we developed a Program in 2021, entitled Veranópolis Resilient City, with a series of projects aimed at raising awareness on the topic of resilience and risk reduction. In 2022, Veranópolis presented its indicators to the United Nations Office for Disaster Risk Reduction, which evaluated the city's stage of development, certifying in stage C: Cities that implement the projects provided for in the action plan.

In line with the 17 SDGs, the SDG 11 was the guiding principle for the creation of the Veranópolis Resilient City Program, which aims to make cities and communities more inclusive, safe, resilient and sustainable. As well as SDG 13 that guided the elaboration of the Project "Waste is your responsibility", which we will describe in the methodology.

## **2 METHODOLOGY**

The research method is classified as applied in nature to generate practical knowledge, with descriptive objective, and qualitative approach that requires a direct analysis between the researcher and the object of study. The technical procedure used was the field study, in order to reach a greater number of people and offer a greater analysis of the researched universe (Gil, 2017).

The purpose of the Project "Waste is Your Responsibility" was to meet Sustainable Development Goal 13: Action against global climate change, which seeks to strengthen resilience and adaptive capacity to climate-related risks and natural disasters in all countries. The Project is in line with the third priority of the Sendai Framework: Investing in disaster risk reduction for resilience, which is part of the Veranópolis Resilient City Program, implemented in the Municipality of Veranópolis, in the State of Rio Grande do Sul, Brazil.

The Project had two objectives: 1) To improve knowledge about separation and correct disposal of solid waste; and 2) Promote a culture of environmental preservation. To this end, we invited six Municipal Schools and two Private Schools to participate in a municipal competition, involving 2,775 students, aged from 4 to 18 years old, 300 public professionals, and 20 professionals from non-governmental organization and private company, totaling more than 3,000 people involved in a five-month work, divided into five stages, namely:

The first stage was the "Awareness Campaign". The campaign was carried out in September 2023, through the dissemination of eight information cards on social media and in schools about the importance of separating and disposing of solid waste.

The second stage was entitled "I participate, I learn". This phase took place in October 2023, a questionnaire was sent with ten questions, three related to the student's profile, and seven referring to the knowledge acquired in the first stage. The questions were worth one point for each correct answer. Each school answered a total of 100 questionnaires, reaching a maximum of 700 points. The link to the questionnaire was sent to the schools digitally.

The third stage was the "Community Action in the Neighborhoods", which took place in November 2023. This stage promoted a walk of integration of the schools with the local community to stimulate the awareness of the preservation of the environment, through recycling, for this, educational material was delivered. Each school was responsible for mobilizing students for the action, which computed 100 points for each school.

The fourth stage was denominated "Recycle to Earn". The schools collected the recyclable waste brought by the students, which was sent to the Municipality's Recyclable Sorting Center. Each participating school received a financial bonus donated by the non-governmental organization Agentes Multiplicadores do Meio Ambiente, and each bag collected generated points for the school.

Finally, the fifth stage will be the "Compilation of data and awards". In December 2023, the data will be compiled and the scores of the participating schools will be added, which will receive a certificate of participation, and the first three will receive a financial bonus.

### 3 RESULTS

The United Nations Office for Disaster Risk Reduction's Global Assessment Report (2022) reported that resilience can be seen as a key link between climate change, disaster risk reduction and sustainable development actions. Action is essential to improve prevention capacity, promote more collaborative and participatory processes, and develop anticipatory governance for our climate future.

With the onset of industrialization era and urbanization of the countries, human kind became one of the biggest polluter, contributing towards the generation of large heaps of waste and unsanitary conditions. To keep this planet clean and habitable waste management is the need of the hour. It is the sum of all the activities involved in collection, transport, treatment and recycling waste material. This is a complex procedure as there are different categories of waste such as solid, liquid, biodegradable and non-biodegradable (Bonn, 2016).

However, this commitment cannot be exclusive to the municipal government, because we are responsible for the waste we generate. The idea of shared responsibility breaks with the idea of government exclusivity, which makes it possible to establish a dialogue and actions together, to find solutions to what we face and what we will face.

In this way, the Project 'Waste is your responsibility' emerged, through the exchange of experiences, initially, between municipal employees of the Department of Social Development, Housing and Longevity, health agents and recyclers of the Municipality of Veranópolis. Subsequently, with the Department of Agriculture and Environment, Department of Education, Schools, non-governmental organization and private company to develop a practice in order to improve knowledge about separation and correct disposal of solid waste, and promote a culture of environmental preservation.

The Project brought together six Municipal Schools and two Private Schools to participate in a municipal gymkhana, involving 2,775 students, aged from 4 to 18 years old, 300 public professionals, and 20 professionals from non-governmental organization and private companies, totaling more than 3,000 people included in a five-month work, divided into five stages.

This social engagement makes us reflect on the definition of education presented by Freire (2016), education is a certain theory of knowledge put into practice. To educate is to promote the practice of a theory about

knowledge. Therefore, every action with an educational purpose would necessarily be based on a conviction about knowledge.

The first educational practice of the Project was denominated "Awareness Campaign", which aimed to sensitize the community on the subject. Eight information cards were released on social media explaining the following topics: 1) Difference between garbage, waste and tailings; 2) Types of waste; 3) Difference between organic and selective waste; 3) Correct disposal of waste; among others. Figure 1 shows the informational material.

Figure 1 - Informational Cards



Source: Prepared by the social actors of the Municipality of Veranópolis.

For Freire (1975), knowledge is not something given and finished, but a social process that demands the transforming action of human beings on the world. In this passage, the author adds to his definition of knowledge the word social, that is, knowledge would not only be a process, but a social process, a process that concerns society. Therefore, knowledge would be a social process that would require the transformative action-reflection of humans on reality.

The social process was strengthened in the second stage "I participate, I learn", where a reaction survey of the knowledge acquired from the disseminated material was carried out. Of the 800 questionnaires answered, 92% presented correct answers, demonstrating the students' participation and interest in the proposed activity.

As far as the act of learning is concerned: whoever teaches, teaches something to someone. Teaching does not exist without learning, and it was by learning socially that, historically, women and men discovered that it was possible to teach. It was in this way, socially learning, that over time, we realized that it was possible to work on ways, paths and methods of teaching. Learning preceded teaching, or in other words, teaching was diluted in the experience of learning. In this way, we are constantly teaching and learning (Freire, 2021).

In this relationship between teaching and learning, the third stage "Community Action in the Neighborhoods" emerged. At this stage, there was a walk to integrate the participants of the gymkhana with the local community, in order to reinforce knowledge about separation and correct disposal of waste, through the delivery of educational material, presented in Figure 2.

Figure 2 - Educational material



Source: Prepared by the social actors of the Municipality of Veranópolis.

Community action is understood as a socio-educational work that consists of a deliberate intervention in a given community, through activities programmed together with local people and institutions, aiming to awaken and expand awareness in relation to the adversities that a community faces.

In the action, the participation of the community was observed. Community engagement is an approach of direct involvement of the population for decision-making and implementation of social policies. The community participatory approach strengthens local capacities, community structures, and local sense of accountability to improve transparency and accountability in different contexts (Ministry of Economy Brazil, 2022).

In addition to participation, the collaboration intensified in the fourth stage "Recycle to win". Collaboration presupposes that the members of a group support each other in order to achieve common and collective goals, establishing relationships that tend towards non-hierarchization, shared leadership, mutual trust and co-responsibility for conducting actions.

The students involved their families in the collection of waste, and the result was surprisingly positive. For Vygotsky (1987, 1998), activities carried out in groups, together, offer enormous advantages, which are not available in individualized learning environments. According to the author, the constitution of the subjects, as well as their learning and thought processes, are mediated by the relationship with other people.

For Ferreira (2000), the development of activities community can create an environment rich in academic and social learning, both for students and teachers, as well as provide a higher degree of satisfaction. Since, collaborative work enables the development of values such as sharing and solidarity.

The execution of the Project proved that shared responsibility is a possible reality. The actions were carried out with the participation of all members, who interacted and shared ideas for the achievement of the proposed objectives. It should be noted that the participation and collaboration of all were important aspects for the success of the work, because through them, the participants were in tune to unite individual skills, in favor of collective achievement.



Finally, the fifth stage will take place in December. The data will be compiled and the score of the participating schools will be added, which will receive a certificate of participation and the first three winners will receive a financial bonus.

## CONCLUSION

There seems to be a consensus that the success of collaborative projects depends on the initial collective organization. Since collaborating is not simple, it is not enough to organize meetings between participants so that collaboration occurs naturally.

In fact, for there to be cohesion in the group, it is important that all participants share the collective goal to a significant degree, but it is also important that they have their individual goals linked to the project, as it reinforces involvement in the work and the sense of personal fulfillment.

Collaborative work requires strong and shared common goals. Achieving this articulation is a fundamental condition for the collaboration process to be a success. Faced with this reflection on collaborative projects, Brazilian municipalities became protagonists in the decision-making processes, at the same time that they had to face problems related to pollution, excess waste, lack of basic sanitation, climate change, among others. Such problems demanded the creation of a new model of public management, which included efficient strategic plans and participatory and collaborative teams.

The implementation of the Project "Waste is your responsibility" demonstrated in practice the participation and collaboration of the community. Through the engagement of all, the following objectives were achieved: 1) To improve knowledge about the separation and correct disposal of solid waste, through the results presented in the questionnaires; and 2) Promote a culture of environmental preservation, involving students, teachers, families and the community in the delivery of educational material and participation in waste collection.

Knowing the place of experience, its possible problems and conflicts, makes it possible to subsidize dialogues and collective reflections on the different perceptions of reality. It was observed in the general analysis that the participants perceived the project as an important opportunity to reflect on the environment. The execution of the Project show that education is one of the main ways to achieve environmental awareness, and that through it, the individual develops knowledge, skills and attitudes aimed at the conservation of the environment.

It is essential to invest in actions that: 1) Reduce waste generation; 2) Increase reuse and recycling; and 3) Promote community education to reduce consumption, waste and correct disposal of all types of waste. Finally, it is essential that government, schools, and the community incorporate projects that encourage sustainable and resilient practices to improve people's quality of life and the balance of the planet.

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