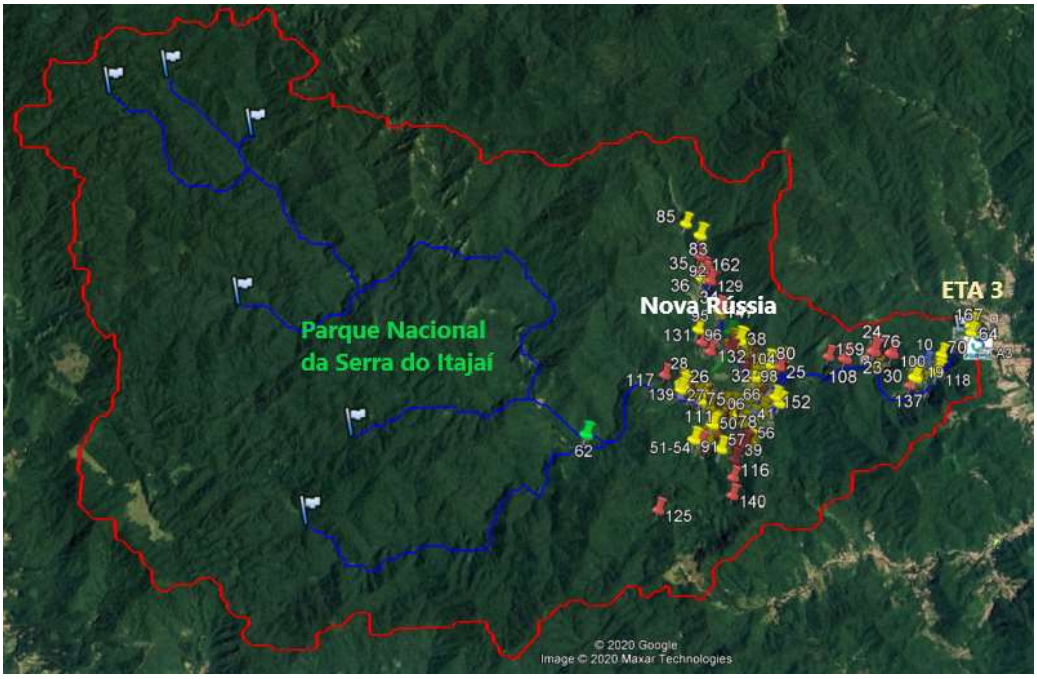
Ecological Sanitation for the Rural Community of Nova Russia in Blumenau/Brazil

Contextualization

The Samae Water Treatment Station (Autonomous Water and Sewage Service), ETA III, located in the extreme south of Blumenau, is currently responsible for supplying about **30%** of the municipality, capturing water from the Garcia stream, whose main springs are located within a federal conservation unit, the Serra do Itajaí National Park. However, between downstream of this and upstream of the catchment, there is only one potentially polluting source capable of compromising the quality of the source, the rural community of Nova Russia.

Location of the rural community Nova Russia in the south of the municipality of Blumenau



Therefore, ensuring the proper conditions for the sanitation of this community is to guarantee the quality not only of the water collected, but also of the water that will be treated and distributed to more than **100,000 people**.

Community Assessment

In order to identify the situation of the sanitary sewage conditions in Nova Russia, Samae technicians went to the field and, in 2019, completed the first sanitary diagnosis of the community, classified in sanitary terms as an isolated community, that is, not covered by the

public collection and effluent treatment. The data from the **170** buildings visited revealed patterns not very different from other rural communities in Brazil, such as the lack of information regarding the importance of periodic maintenance of the septic tank and anaerobic filter systems. In addition, this diagnosis reached the following worrying results: **16%** of the houses do not have any form of sanitary treatment, discharging their effluents directly into the Garcia and Minas da Prata streams or into sinks; in the remaining **84%** of the houses, the effluents are sent to septic tanks, followed or not by complementary treatment, of which only **15%** have inspection ducts, and only **2%** carry out periodic cleaning. In short, the sewerage condition of the locality is precarious and requires significant improvements.

Effluent discharge directly into the Garcia stream

This **Rotary Foundation Global Grant** funding project is essentially of the area of focus **Water and Sanitation**, as it aims to address the sewage system of the 40 poorest homes in the community, unable to afford this investment, implementing ecological and sustainable sewage treatment systems, and thus suppressing the direct and indirect discharge of its effluents into the Garcia and Minas da Prata streams. As a result, this project also addresses the areas of focus **Disease Prevention and Treatment** and **Supporting the Environment** of The Rotary Foundation.

After this project and with the interest and support of Samae, the other houses will be guided to invest in the implementation of this system in order to universalize ecological sanitation throughout the rural community of Nova Russia, which is why this project also addresses the area of focus **Economic and Community Development** of The Rotary Foundation.

Materials and Technology

Although the septic tank and anaerobic filter set is the model established in most Brazilian municipalities, its function is to reasonably remove the excessive organic load present in the sewage, requiring periodic maintenance of the system through the septic tank truck, a practice almost non-existent in that community.

Aiming to present a model of autonomous treatment that does not require this mechanical instrument, which in some cases is inaccessible and which has greater efficiency than the conventional treatment system, this Rotary Foundation Global Grant funding project is proposed to build in that community 40 ecological and sustainable sewage treatment systems, the Evapotranspiration Tanks – **TEvaps**, popularly known as Green cesspool or Ecological cesspool.

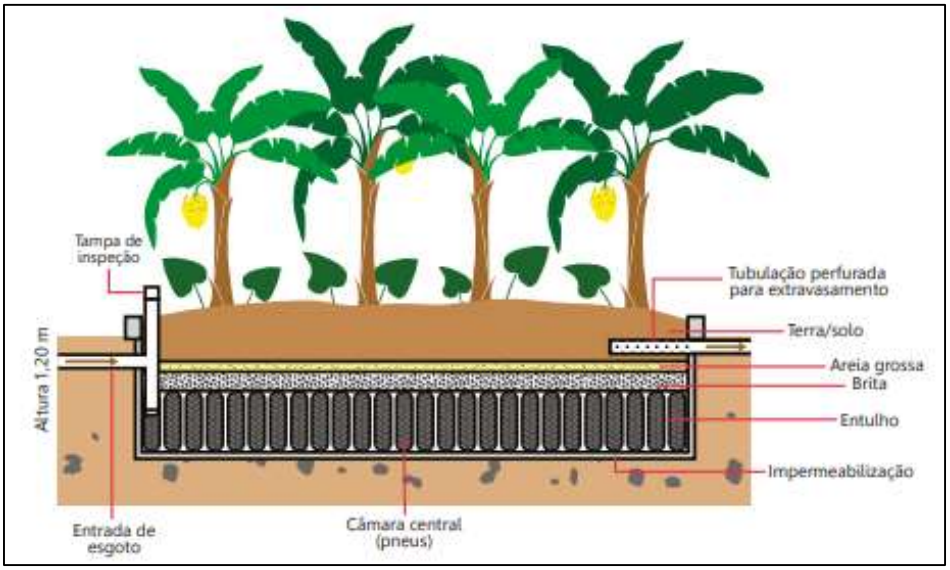
TEvap with banana plantation

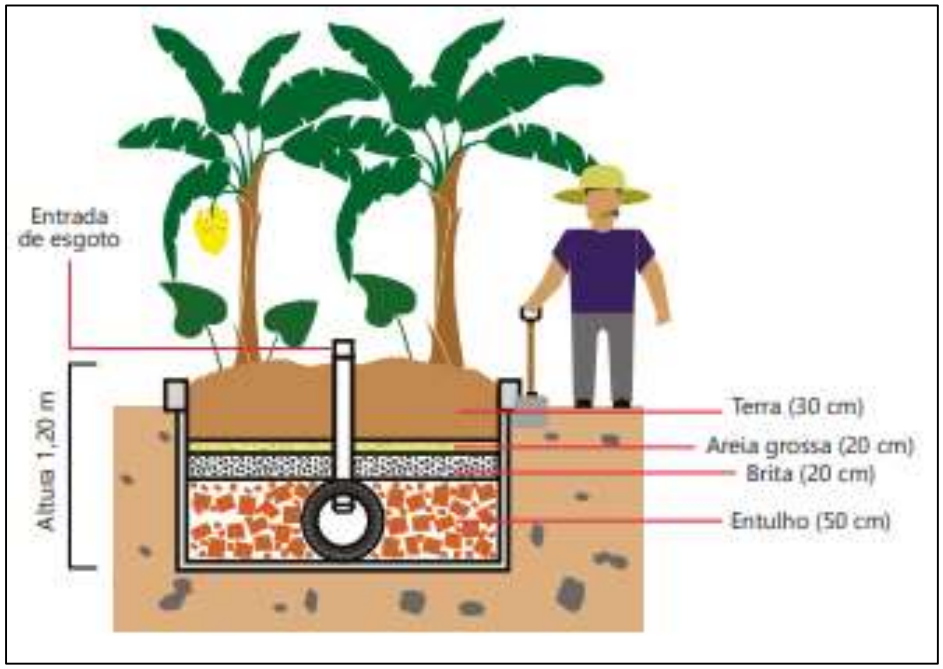
Source: https://ndmais.com.br/infraestrutura/samae-trabalha-conceito-de-saneamento-produtivo-junto-a-comunidades-de-blumenau/

This method of treatment seeks to imitate the natural processes of purification of organic matter through the action of microorganisms (bacteria and fungi) and plant species that make up the system, allowing water and nutrients to be reused: the liquid fraction of sewage

(**99%**) is evaporated by the soil and transpired by plant leaves, while the solid part (**1%**) is incorporated into the vegetation biomass.

TEvaps Schemes





Source: Figueiredo, I. C. S. Tratamento de Esgoto na Zona Rural: fossa verde e círculo de bananeiras. Campinas, SP, Unicamp, 2018.

Through the technical support and monitoring of Samae, a first family implemented one of these ecological septic tanks of the TEvap type and it was observed that a backhoe and labor for 4 days of work were needed to assemble the structure with a volume of 10 m3, where were used:

- 26 tires;
- 1,5 m^3 of sand;

- 5 m^3 of clay and rubble;
- 1,5 m^3 of gravel;
- 3 m^3 of concrete.

Samae, who has the technical knowledge of the implementation of these ecological cesspits, will be responsible for monitoring and providing the necessary guidance for the construction of the 40 TEvaps proposed in this Rotary Foundation Global Grant funding project.

Planning

According to the pilot project for the implementation of the TEvap type ecological cesspool built by the first family of the rural community of Nova Russia, the total investment, including machinery and labor, was **US$ 1,000** per TEvap.

As this project proposes to fund the construction of 40 TEvap ecological cesspits, the total value of this Rotary Foundation Global Grant funding project in the area of focus **Water and Sanitation**, subarea **Watershed Management**, is **US$ 40,000**.

It is proposed to obtain this amount of US$40,000 for this Global Grant project through the following distribution of contributions:

Brazil – District 4652	Rotary Clubs from Blumenau	US$ 3,400
	District	US$ 12,000
	Rotary Foundation	US$ 9,600
International	Rotary Club	US$ 6,000
	District	US$ 5,000
	Rotary Foundation	US$ 4,000

Monitoring and Evaluation

This project to finance the construction of 40 TEvap type ecological septic tanks will directly serve 40 houses in the rural community of Nova Russia that will no longer discharge their effluents directly and indirectly into the Garcia stream. In addition, the improvement of the water quality of this source, from where Samae, through its Water Treatment Station – ETA III, collects and treats the water that supplies around 30% of the population of Blumenau, implies, therefore, an improvement of the water quality of about 100,000 people.

Blumenau, November 2021.

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