



*“SRT humming..... Soil enriching, Crops booming and Farmers Empowering”*

## The Impact of SRT on Methane Emission Reduction in Paddy Field

### Exciting Breakthrough in Rice Cultivation:

At **Saguna Rural Foundation**, we are thrilled to share groundbreaking news that could change the narrative around rice cultivation—a crop that has long been viewed as a significant contributor to climate change. For decades, rice farming has been criticized for its high water consumption and large methane emissions, but we are excited to announce that **rice can now be cultivated with almost zero methane emissions while reducing water consumption** by nearly half, and simultaneously lowering production costs by the **Saguna Regenerative Technique (SRT)** method.

This is a game-changer, especially for the 60-70% of the global population that relies on rice as a staple food. Traditionally, rice farming involves ploughing, puddling, transplanting, and flooding fields to suppress weeds. However, this practice creates anaerobic conditions that naturally lead to the decomposition of organic matter, generating large quantities of methane—a potent greenhouse gas.

Contrary to popular belief, it's not the use of chemicals or fertilizers like urea that is primarily responsible for methane emissions. **The real culprits are the conventional methods of ploughing and puddling**, which trap water and create anaerobic (oxygen-free) conditions, ideal for the growth of methanogenic bacteria.

The Saguna Regenerative Technique (SRT) provides an innovative and sustainable solution to the challenges of rice cultivation. One of our most groundbreaking discoveries came in 2013 when, after harvesting, we observed thousands of earthworms in the SRT paddy fields—a natural confirmation of the presence of aerobic conditions at the root zone. This was first indicated by the appearance of **dozens of Black Ibis birds in the fields**, a rare sight in our area. The abundance of earthworms signaled that oxygen-rich, aerobic conditions were present. Later, we found a 2017 scientific paper that echoed our observation: earthworms play a critical role in reducing methane emissions ([Impact of Earthworms on Methane Emission](#)). SRT eliminates ploughing and puddling in rice cultivation, transforming the way rice is grown. Instead of relying on these harmful practices, SRT creates an **aerobic root zone**—an environment that is rich in oxygen and discourages the growth of methane-producing bacteria.

This is achieved by leaving the roots of previous crops and weeds in place to die and decay, enriching the soil. Scientifically proven weedicides are applied while the roots are still alive, turning the dying root mass into food for earthworms and beneficial microbiota. A significant confirmation of SRT's impact was made on October 18, 2024, when our team, in collaboration with a senior scientist from BARC, Mumbai, used a Biogas Methane Analyzer (a product of Ambetronics Engineers Ltd, Mumbai) to measure and validate these results.



*Thousands of earthworms naturally appear in SRT paddy fields due to which dozens of black ibis birds are attracted to the field.*

### Scientific Validation

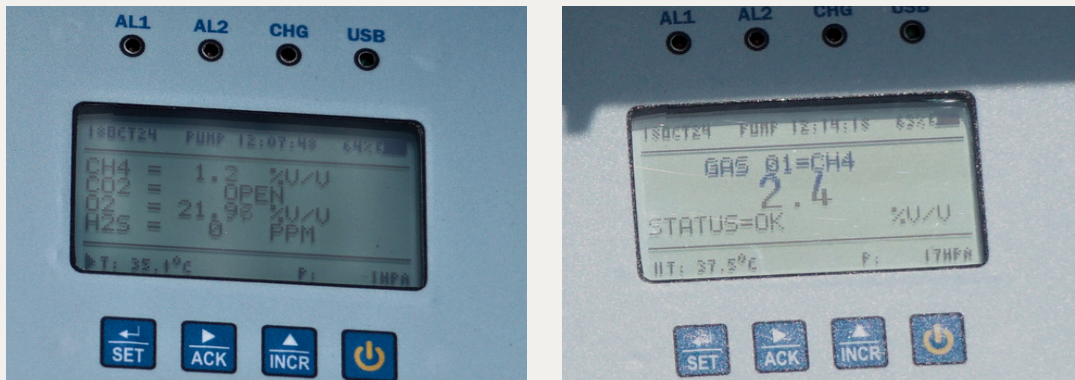
To measure the impact of SRT on methane emissions, our team used a biogas methane analyzer in collaboration with scientists from **Bhabha Atomic Research Centre (BARC)**. The gas emitting from the paddy field was trapped in the acrylic chamber of 30X30X100 cm for 90 minutes. The probe of the analyzer was inserted through a whole of the same size. The results were astonishing—SRT dramatically reduced methane emissions in rice paddies compared to traditional methods by almost 18 times, validating our approach scientifically.

### Readings by Biogas Methane (CH<sub>4</sub>) Analyzer

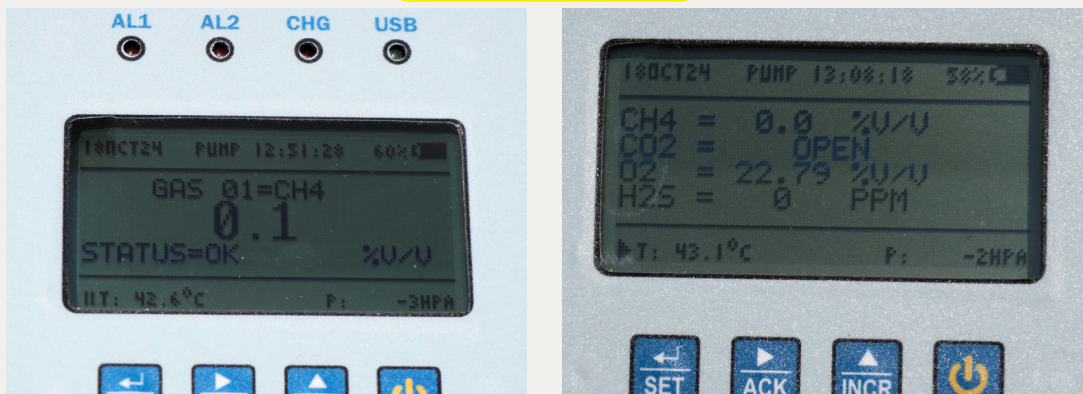
Reading No.	Plot Description	Methane in PPM
1	Traditional Paddy Plot	12000 (1.2%)
2	Traditional Paddy Plot	24000 (2.4%)
3	SRT Paddy Plot No 20	1000 (0.1%)
4	SRT Paddy Plot No 11	0 (0.0%)



## Traditional Paddy Plot



## SRT Paddy Plot



[Video Link : https://drive.google.com/file/d/1\\_l2nSxA5-BszODL7zTw\\_wS9MGqwSfRbc/view?usp=sharing](https://drive.google.com/file/d/1_l2nSxA5-BszODL7zTw_wS9MGqwSfRbc/view?usp=sharing)

### How Does SRT Work?

The key to SRT's success lies in fostering aerobic conditions in the root zone. This is achieved by promoting the natural activity of earthworms and beneficial soil organisms, a process known as **bioturbation**. As earthworms burrow through the soil, they create natural pathways for air and water to penetrate deep into the root zone, ensuring that the soil remains oxygen-rich. This prevents the creation of the anaerobic conditions that methanogenic bacteria thrive in, effectively reducing methane emissions.

Moreover, SRT not only halts the growth of methanogenic bacteria but also promotes the natural growth of **methanotrophic bacteria**—organisms that consume methane as a food source. This further reduces the amount of methane released into the atmosphere.

Methane is a colorless, odorless gas, 22 times more harmful than CO<sub>2</sub>. It is a potent greenhouse gas, contributing to global warming by trapping heat in the atmosphere.

## Busting Myths About Weedicides

Another myth that SRT challenges is the notion that weedicides kill earthworms and soil microbes, but in reality, the opposite is true. In the SRT system, earthworm activity is enhanced, and the healthy microbial life in the soil thrives, creating a natural defense against weeds without the need for excessive chemical use. In short if the scientifically approved protocol of weedicides as is adopted in SRT by the farmers the thousands of earthworms are quickly visible in the land. The soil becoming soft and fragrant is a common observation of many SRT farmers which is the sign of enhanced microbial activity.

## The Path Forward

With SRT, we are redefining what's possible in rice cultivation. By reducing water usage, cutting methane emissions, and lowering production costs, SRT offers a sustainable path forward for rice farmers around the world. This technique not only benefits the environment but also improves the livelihoods of farmers by enhancing soil health and reducing input costs.

At Saguna Rural Foundation, we are committed to spreading this knowledge to farmers, scientists, ecologists, and climate activists globally. Together, we can make rice cultivation part of the solution, rather than the problem, in the fight against climate change.

Join us in celebrating this monumental achievement!

For more details or to learn how to adopt the Saguna Regenerative Technique, please contact Saguna Rural Foundation.

Thank you!

