



SANSKAR LIVING LOOP

ODISHA'S FIRST CLIMATE-POSITIVE SCHOOL

"From Rahani to the World: Zero Waste, Zero Emission and 100% Student Run"

PROJECT CLASS RANGE:	Class 5 – 10
DURATION:	12 Weeks
SDGS ADDRESSED:	SDG 2 (ZERO HUNGER), SDG 7 (AFFORDABLE & CLEAN ENERGY), SDG 12 (RESPONSIBLE CONSUMPTION), SDG 15 (LIFE ON LAND)
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ACADEMIC YEAR: 2026-27	Academic Year: 2026-27



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1. ABOUT THE PROJECT

Sanskar Public School, nestled amid the rural landscape of Dhenkanal, Odisha, is undertaking a pioneering initiative called the **Sanskar Living Loop System** — an integrated, self-sustaining ecological campus model that brings together indigenous cattle rearing, organic farming, renewable energy, water conservation, and waste recycling under a single, unified roof.

Rather than treating sustainability as a collection of isolated activities, the **Sanskar Living Loop System** is designed as a true **closed-loop ecosystem**, where the output of one unit becomes the input of another. Cow dung and urine from the Gir Goshala feed the Gobar gas plant and the vermi-compost units; the resulting biogas and organic manure, in turn, nourish the kitchen garden, orchards, miyawaki forest and agricultural fields; crop and kitchen waste feed the fishery and duckery ponds; and rainwater and treated wastewater irrigate the entire green campus — all powered substantially by solar energy. Nothing is wasted, and every resource cycles back into the system that produced it.

Situated in a rural setting, the school is uniquely positioned to turn its campus into a living laboratory — a place where students don't just study concepts of sustainability, organic living, and rural self-reliance in textbooks, but witness and participate in them every single day. The project reflects the school's deeper commitment to *Sanskar* — values, culture, and rootedness — by reviving traditional **Indian Agrarian Wisdom** (Gir cows, Gobar gas, vermi-composting, natural farming) and blending it with **Modern Renewable Technology** (solar power, scientific waste-water treatment, rainwater harvesting).

2. GOALS & OBJECTIVES

Goals:

To design and operationalize a self-sustaining, closed-loop ecological campus at Sanskar Public School that integrates indigenous cattle rearing, organic farming, renewable energy, water conservation, and waste recycling into a single circular ecosystem — transforming the campus into a living laboratory where students experience sustainability, self-reliance, and traditional Indian agrarian wisdom as lived practice rather than classroom theory.

Objectives:

- 1. Establish a Closed-Loop Resource Cycle:** Create a functioning ecological chain in which the output of every unit (Goshala, biogas plant, vermi-compost unit, kitchen garden, fishery, duckery, and orchards) becomes a productive input for another, minimizing waste and maximizing resource efficiency across the campus.
- 2. Revive Indigenous Agrarian Practices:** Promote Gir cattle rearing, natural/organic farming, and traditional composting methods as a means of preserving indigenous knowledge systems and demonstrating their continued relevance and viability today.
- 3. Achieve Energy Self-Sufficiency:** Harness cow dung-based biogas and solar power to substantially meet the campus's cooking and electricity needs, reducing dependence on conventional/non-renewable energy sources.
- 4. Enrich Soil and Promote Organic Cultivation:** Utilize vermi-compost and organic manure generated on campus to nourish the kitchen garden, orchards, Miyawaki forest, and agricultural fields, eliminating reliance on chemical fertilizers.

5. Conserve and Recycle Water: Implement rainwater harvesting and scientific wastewater treatment systems to irrigate green spaces and support aquaculture, ensuring efficient, sustainable water use across the campus.

6. Recycle Organic Waste into Productive Use: Channel crop residue and kitchen waste into fishery and duckery ponds, converting potential waste streams into a source of nutrition and biodiversity.

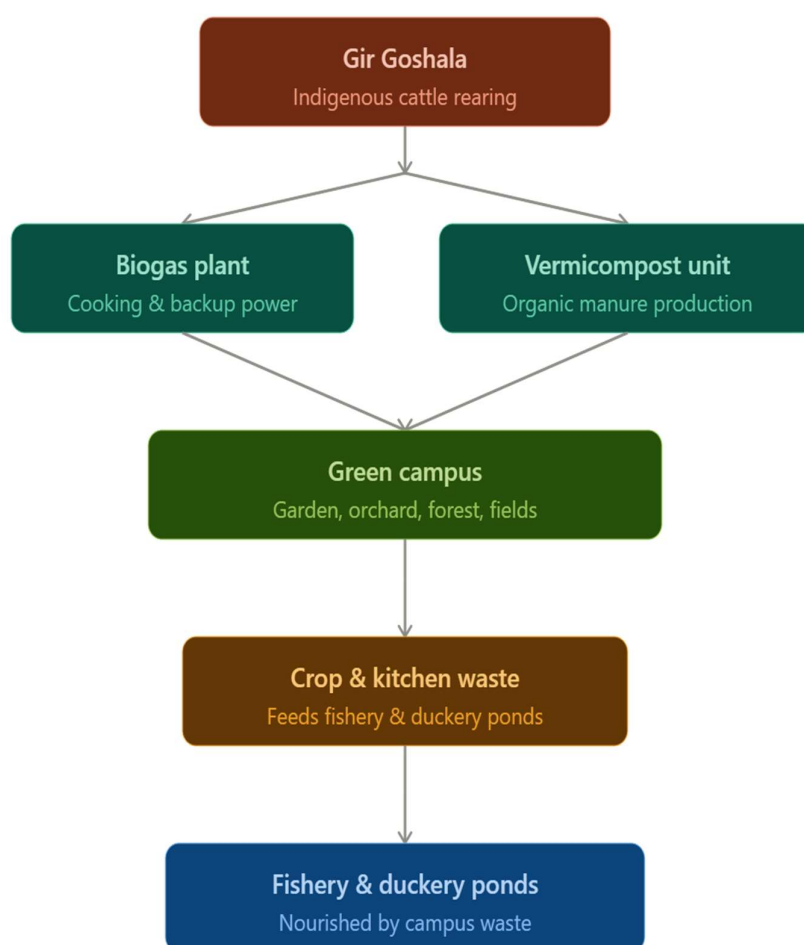
7. Create a Living Laboratory for Experiential Learning: Enable students to directly observe, participate in, and learn from each stage of the ecological cycle — fostering hands-on understanding of ecology, sustainability, and rural self-reliance beyond the textbook.

8. Instill Values of Sanskar — Rootedness and Environmental Responsibility: Cultivate in students a deep-rooted respect for nature, traditional culture, and sustainable living, aligning modern renewable technology with time-tested Indian values.

9. Build a Scalable, Replicable Rural Sustainability Model: Develop the Sanskar Living Loop System as a demonstrable model that other rural institutions and communities can study, adapt, and replicate to advance ecological self-reliance.

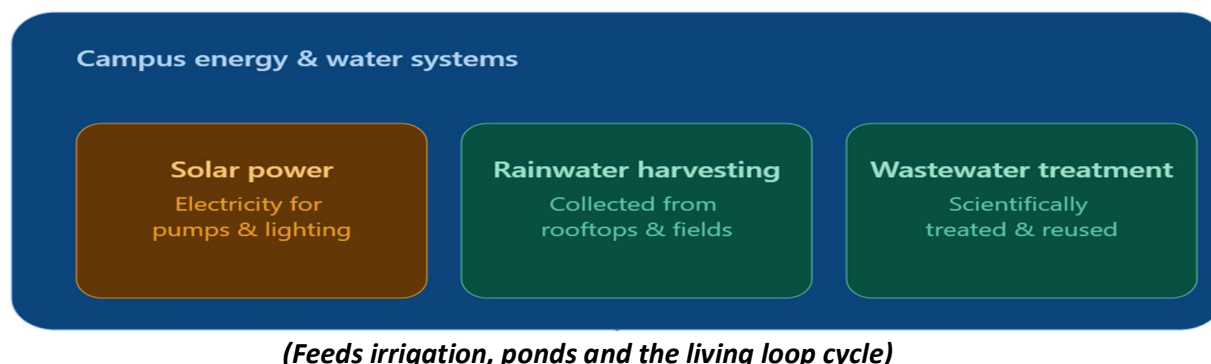
3. THE “LIVING LOOP” CONCEPT

The Living Loop is best understood as one continuous cycle rather than a set of separate green initiatives. Here's the core biological loop first — how cattle, biogas, compost, cultivation, and aquaculture chain into one another:



(Pond sediments and duck waste return to enrich vermi-compost and fields)

Alongside this biological cycle, three support systems keep the loop running and connect it back to the campus's daily needs — solar power, rainwater harvesting, and treated wastewater:



4. A ROUNDOABOUT OF OUR LOOP SYSTEM

The sections below describe each component of the **Sanskar Living Loop System** and how it interlinks with the others to form one continuous, self-renewing cycle of life on campus.

1. Gir Cow Goshala: The Heart of the Loop

At the heart of the Living Loop System stands the **Gir Cow Goshala**, home to indigenous Gir cows — a breed prized for its resilience, disease resistance, and the high quality of its A2 milk, dung, and urine. Beyond providing pure, wholesome milk for the school community, the Goshala serves as the biological engine of the entire campus. Its dung and urine are collected daily and channelled to the Gobar gas plant and vermi-compost pits, making the Goshala the starting point of the nutrient cycle that sustains the gardens, orchards, and farmlands. For students, the Goshala also becomes a living classroom in animal husbandry, compassion, and the cultural significance of cow-based rural economy in India.



2. Organic Kitchen Garden:

The **Organic Kitchen Garden** supplies fresh, chemical-free vegetables and herbs directly to the school's kitchen, closing the loop between "farm and plate" within the same campus. Nourished entirely by vermi-compost and Gobar-gas slurry from the Goshala, and irrigated with harvested rainwater and treated wastewater, the garden demonstrates chemical-free, nutrient-rich cultivation on a small, manageable scale. It doubles as an experiential learning space where students engage in sowing, tending, and harvesting, learning first-hand the value of fresh, seasonal, pesticide-free food.



3. Organic Agriculture:

Scaling beyond the kitchen garden, the school's **Organic Agriculture** fields put natural farming principles into practice across larger cropped areas – cereals, pulses, and seasonal crops grown without synthetic fertilizers or pesticides. Enriched by compost and slurry from the Goshala and Gobar gas unit, and supported by efficient irrigation from the rainwater harvesting and waste-water systems, these fields showcase a viable, chemical-free model of farming suited to Dhenkanal's rural soil and climate. The produce supports the school's food needs while offering a template that surrounding farming families can learn from and adopt.



4. Fruit Orchards:

The **Fruit Orchards** add a long-term, tree-based dimension to the campus's green cover, growing regionally suited fruits (Mango and its varieties and Guava) that provide seasonal nutrition to students while enhancing biodiversity and shade across the campus. Like the other plant-based units, the orchards draw on organic manure from the vermi-compost and Gobar gas units and are watered through the harvested and recycled water network – reinforcing the campus-wide cycle of "waste to nutrient to food."



5. Fodder Cultivation:

A dedicated **Fodder** section ensures a steady, nutritious supply of green fodder for the Gir cows throughout the year, closing yet another loop within the system: crops and grasses grown using the farm's own organic compost return as feed for the cattle that generate that very compost. This self-sufficiency in fodder reduces dependence on external feed, keeps the Goshala healthy and productive, and reinforces the circular, self-reliant character of the entire campus.



6. Duckery and Pisciculture:

The **Duckery** unit introduces small-scale poultry (duck) rearing into the loop. Ducks feed on kitchen scraps, garden and pond by-products, while their droppings enrich the fishery ponds and surrounding soil with nutrients – a traditional integrated-farming technique that improves pond fertility and reduces feed costs. The duckery adds diversity to the campus's living systems and offers students' insight into integrated animal husbandry practices common to rural Odisha.

The **Fishery** pond completes the animal-integration loop, benefiting from the nutrient-rich inputs of the duckery and organic farm run-off, which naturally enrich the water for fish growth. In turn, pond water and sediment can be used to further nourish the garden and fields, and the fishery contributes to the school's nutritional self-sufficiency. It also

serves as a hands-on demonstration of integrated aquaculture – a low-cost, sustainable model relevant to the rural Dhenkanal suburban.



7. Solar Power Plant:

Powering much of this ecosystem is the campus **10 KW roof-top Solar Power Plant**, which harnesses Dhenkanal's abundant sunshine to generate clean electricity for the school's lighting, water pumping, irrigation systems, and other operational needs. By reducing dependence on grid power and fossil fuels, the solar installation lowers the campus's carbon footprint and operating costs, while giving students a tangible example of renewable energy technology in daily use.



8. Waste Water Management:

The **Waste Water Management** system treats and recycles water used across the campus – from kitchens, washrooms, and other facilities – rather than letting it go to waste. Through natural or low-cost treatment methods, this grey water is purified to a standard safe for irrigating the orchards, fodder fields, and organic farmland, significantly reducing the campus's fresh-water demand and demonstrating responsible water stewardship in a resource-conscious rural setting.

9. Rain Water Harvesting:

Rainwater Harvesting structures across the campus capture and store monsoon rainfall for use through the drier months, recharging groundwater and supplementing the irrigation needs of the gardens, orchards, farms, and fishery. In a region where water availability can be seasonal, this system ensures the entire Living Loop remains resilient and self-sufficient year-round, reducing reliance on external or ground-water sources alone.

10. Gobar Gas (Bio-Gas) Plant:

The **Gobar Gas Plant** converts cow dung from the Goshala into clean-burning biogas, used for cooking fuel in the school kitchen – reducing dependence on LPG or firewood. The by-product of this process, nutrient-rich bio-slurry, is routed directly to the kitchen garden, orchards, and agricultural fields as a powerful organic fertilizer. This unit is the vital link that transforms animal waste into both energy and soil nourishment, epitomizing the "waste-to-wealth" philosophy of the entire project.

11. Vermi-Compost Unit:

The **Vermi-Compost Unit** uses earthworms to convert farm residue, dung, and organic waste into rich, high-quality compost – a natural fertilizer free of chemicals. This compost is the primary nutrient source for the kitchen garden, orchards, fodder fields, and organic agriculture plots, ensuring that virtually all organic waste generated on campus is returned to the soil rather than discarded, completing the fundamental nutrient cycle of the Living Loop System.

05. SAFETY CONSIDERATIONS:

A. Animal Husbandry (Goshala) Safety:

- Trained staff supervise all student interactions with cattle; students observe or assist but don't handle animals unsupervised.
- Protective gear (gloves, closed footwear) worn during milking, dung collection, and cleaning.
- Regular veterinary check-ups and vaccination of Gir cows to prevent zoonotic disease transmission
- Hand washing or sanitization protocols enforced after any animal contact.

B. Biogas (Gobar Gas) Plant Safety:

- Plant is located away from classrooms and student gathering areas due to flammable gas risk
- Proper ventilation and leak-detection checks conducted regularly.
- Students observe the process from a safe distance; only trained operators handle valves and connections.
- Fire safety equipment kept near the plant; no open flames permitted nearby.

C. Water & Wastewater Management Safety:

- Treated wastewater used only for irrigation, never for drinking or direct food contact, to avoid contamination risk.
- Students wear gloves when handling grey water systems; no direct contact encouraged for younger students (Class 5–6).
- Regular water quality testing to ensure treatment standards are met before reuse.

D. Field, Orchard & Vermi-compost Safety:

- Sun hats, water breaks, and time limits for outdoor field work, especially during peak heat.
- Basic tools only (hand hoes, trowels); no heavy or motorized machinery given to students.
- Vermi-compost pits monitored for safe handling of decomposing organic matter and to avoid pest/insect bites.

E. Fishery & Duckery (Aquaculture) Safety:

- Pond areas supervised at all times; no student allowed near pond edges unaccompanied.
- Trained adults presence during any close-water activity.
- Feeding and observation done from designated safe platforms.

F. Solar Power Plant Safety:

- Rooftop installation is off-limits to students; access restricted to trained technicians.
- Electrical safety signage and insulated wiring maintained; regular inspection for wear and tear damage is done.

06. ETHICAL CONSIDERATIONS:

A. Animal Welfare: Gir cows and ducks are reared with adequate space, nutrition, and veterinary care — the project prioritizes animal wellbeing over productivity or profit.

B. Age-Appropriate Participation: Tasks are calibrated by class group; younger students (Class 5–6) engage in lighter, observational roles while older students (Class 9–10) take on more hands-on responsibilities.

C. Voluntary & Educational Intent: Student involvement is framed as experiential learning, not unpaid labour — participation supports curriculum goals, not commercial output.

D. Environmental Integrity: No chemical fertilizers, pesticides, or synthetic inputs are used, honoring the "zero waste, zero emission" commitment made in the project's framing.

E. Cultural Respect: Indigenous practices (Gir cattle rearing, traditional composting) are presented with respect for their agrarian and cultural origins.

F. Community Relevance: The model is designed to be shared with and adapted by surrounding farming families, reflecting a commitment to community benefit.

G. Transparency in Reporting: Data, outcomes, and challenges from the project will be documented honestly, including limitations, to maintain credibility as a "replicable model".

H. Inclusivity: All student teams (Class 5–10) are given a role in the loop, ensuring equitable participation across age groups rather than concentrating responsibility among a few.

07. ACCOMPLISHMENTS OF THE SANSKAR LIVING LOOP:

A. Established a Fully Functional Closed-Loop Ecosystem:

- Successfully integrated 11 distinct units (Goshala, biogas plant, vermi-compost, kitchen garden, organic agriculture, orchards, fodder cultivation, duckery, fishery, solar plant, water systems) into one continuous, self-sustaining cycle — moving sustainability from isolated activities to a genuine circular system.

B. Achieved Indigenous Cattle-Based Resource Generation:

- Set up a Gir Cow Goshala providing pure A2 milk while simultaneously generating dung and urine that feed two downstream systems (biogas and vermi-compost) — turning a single input into multiple outputs.

C. Built Renewable Energy Infrastructure:

- Installed a 10 KW rooftop solar power plant meeting lighting, pumping, and irrigation energy needs.
-Commissioned a Gobar Gas plant converting cow dung into clean cooking fuel, reducing dependence on LPG/firewood.

D. Eliminated Chemical Inputs Across Farming Operations:

- Converted the kitchen garden, orchards, fodder fields, and larger agricultural plots to 100% organic cultivation, relying entirely on vermi-compost and bio-slurry instead of synthetic fertilizers and pesticides.

E. Achieved Water Self-Sufficiency:

- Implemented rainwater harvesting to capture monsoon water for dry-season use.
- Set up a wastewater treatment system that recycles grey water for irrigation, reducing fresh-water dependency campus-wide.

F. Diversified Food & Nutrition Sources:

- Developed fishery and duckery ponds that convert crop and kitchen waste into a productive nutrition source, contributing to the school's food self-sufficiency.
- Cultivated fruit orchards (mango varieties, guava) adding long-term nutritional and biodiversity value.

G. Created a Self-Sustaining Fodder Loop:

- Established a dedicated fodder cultivation system using the farm's own compost, closing an additional internal loop and reducing external feed dependency for the Goshala.

H. Transformed the Campus into a Living Laboratory:

- Successfully shifted sustainability education from textbook theory to hands-on, experiential learning — students across Class 5–10 directly participate in every stage of the ecological cycle (planting, composting, milking, pond monitoring, etc.)

I. Positioned the School as a Sustainability Pioneer:

- Recognized as **Odisha's first climate-positive school**, with the Sanskar Living Loop model designed for scalability — offering a replicable framework other rural institutions and surrounding farming communities can study and adopt.

J. Revived Traditional Knowledge Alongside Modern Technology:

- Successfully blended indigenous agrarian wisdom (Gir cattle rearing, natural farming, traditional composting) with modern renewable systems (solar power, scientific wastewater treatment) — demonstrating that heritage practices and contemporary technology can co-exist productively.

K. Advanced Multiple SDGs Simultaneously:

- Made measurable contributions toward SDG 2 (Zero Hunger) via food production, SDG 7 (Clean Energy) via solar and biogas, SDG 12 (Responsible Consumption) via the zero-waste loop, and SDG 15 (Life on Land) via organic farming and afforestation efforts (**Miyawaki Forest**).

08. CONCLUSION

Together, these twelve components do not function as separate departments but as **interlocking parts of one living organism** — the Sanskar Living Loop System. Dung becomes gas and compost; compost and slurry feed gardens, orchards, fields, and fodder; fodder feeds cattle; farm and kitchen waste feed ducks and fish; rain and recycled water irrigate it all; and the sun powers the machinery that keeps it running.

For **Sanskar Public School**, this is more than an infrastructure project — it is a values-driven educational model that teaches self-reliance, ecological responsibility, and respect for traditional Indian agrarian wisdom, preparing students to be conscious custodians of both land and community in rural Odisha and beyond."

09. ACKNOWLEDGEMENT

We express our heartfelt gratitude to our school management, Principal and the National Education Board for Vocational Training for giving this opportunity to undertake and showcase our effort in form of "**SANSKAR LIVING LOOP**" project. We sincerely thank our teachers and mentors for their constant guidance in planning the garden, composting system, and Bio-Gas plant and many other inevitable inputs during the conduction of project. We are grateful to the school staff for their support and to the local farmers for providing valuable information regarding our project. Special thanks to our students for their teamwork and to our parents for their encouragement, without which this project would not have been possible.

