



MODEL EXHIBITION ON SUSTAINABLE LIFESTYLES

Under the Environment Education Programme

2025-26



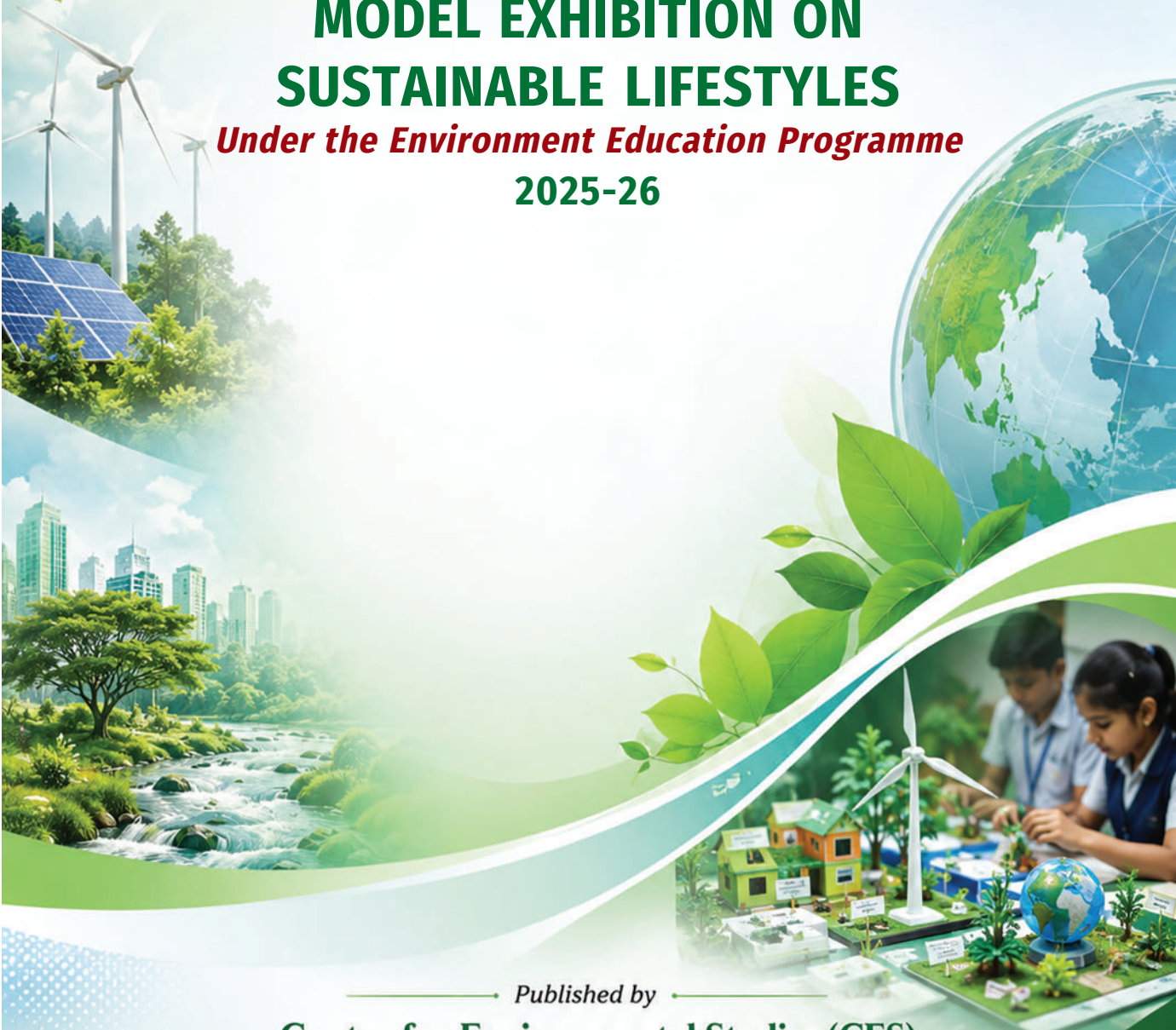
IA-EEP, Centre for Environmental Studies (CES)
Department of Forest, Environment & Climate Change, Odisha



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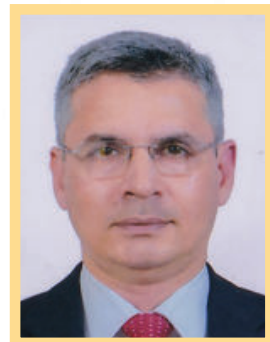
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Shri Bhaskar Jyoti Sarma, IAS

Principal Secretary to Govt,
Forest, Environment & Climate Change Department
Government of Odisha



MESSAGE

I am delighted to note the publication of the report on the Model Exhibition on Sustainable Lifestyles organised under the Environment Education Programme (EEP) of the Ministry of Environment, Forest and Climate Change, Government of India, during 2025-26. The exhibition provided an excellent platform for students to present innovative ideas and practical solutions related to environmental conservation and sustainable living.

I sincerely appreciate the efforts of the Centre for Environment Studies (CES), under the Department of Forest, Environment & Climate Change, Odisha, in successfully organising the exhibition from Block Level to State Level, ensuring wide participation and meaningful engagement of students and teachers across the state. Such initiatives play an important role in promoting scientific temper, creativity, and environmental awareness among young learners.

I congratulate all the participating students, teachers, and organisers for making the programme a grand success. I am confident that this publication will inspire many more young minds to contribute towards building a cleaner, greener, and sustainable future.

Best wishes for the continued success of such initiatives.


(Bhaskar Sarma)



Dr. K. Murugesan, IFS

Principal Chief Conservator of Forests & HoFF and
Director, Centre for Environmental Studies (CES),
Forest, Environment & Climate Change Department,
Government of Odisha



MESSAGE

It gives me immense pleasure to present this publication documenting the Model Exhibition on Sustainable Lifestyles organised under the Environment Education Programme (EEP) of the Ministry of Environment, Forest and Climate Change, Government of India, during 2025-26.

The successful implementation of this three-tier initiative - from Block to District to State Level - reflects a remarkable commitment to promoting environmental awareness and action-oriented learning across Odisha. The enthusiastic participation from all 314 blocks and 30 districts of the state stands as a testament to the collective dedication of students, teachers, education officers, and the wider community.

The theme "Sustainable Lifestyle for Environment (LiFE)" provided a meaningful and forward-looking framework for young minds to explore practical solutions to pressing environmental challenges. The innovative models presented across the seven thematic areas demonstrated not only scientific temper and creativity but also a deep sense of environmental responsibility. It is particularly encouraging to witness students proposing locally relevant yet globally significant solutions that align with the broader vision of sustainable development.

The progression from Block to District and finally to the State Level ensured inclusivity, transparency, and healthy academic competition. Each stage of the exhibition strengthened the culture of inquiry, innovation, and environmental stewardship among young learners. The State Level Exhibition, which brought together the finest models from across Odisha, showcased the diversity of ideas and the extraordinary potential of our youth to lead the movement towards sustainable living.

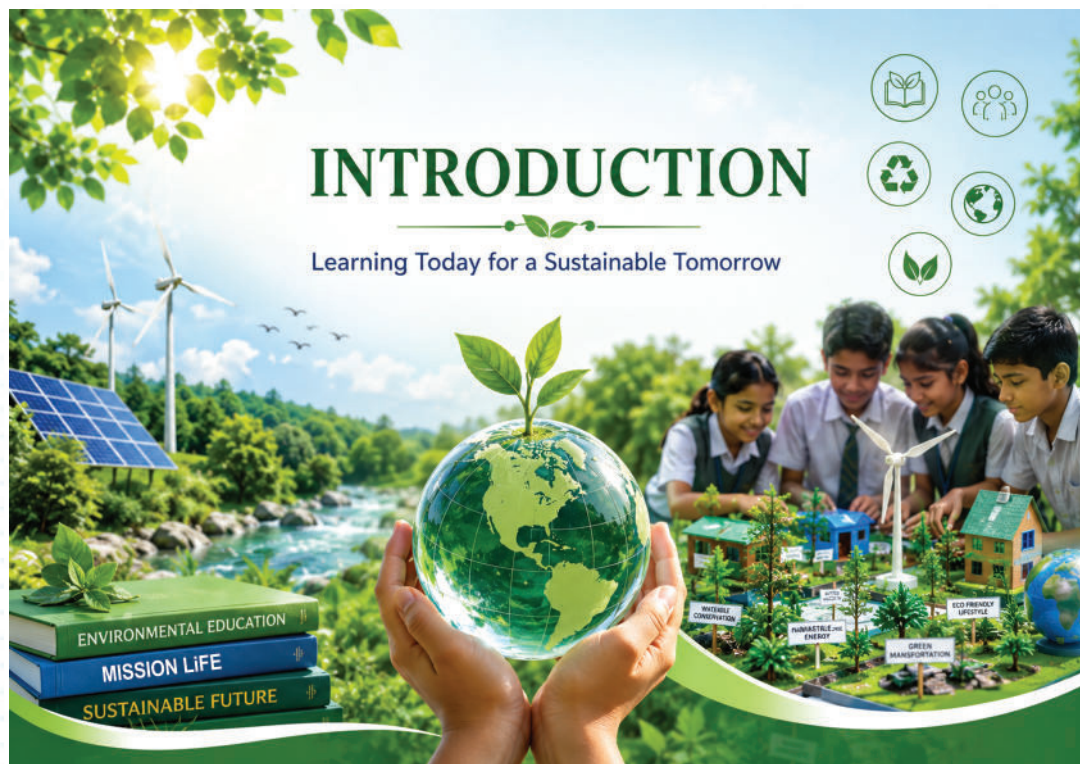
This compilation of synopses serves as both a record of these inspiring efforts and a valuable resource for educators, policymakers, researchers, and students. It reflects the power of environmental education in shaping informed, responsible, and proactive citizens committed to building a cleaner, greener, and more sustainable future.

I extend my sincere appreciation to the Ministry of Environment, Forest and Climate Change for its continued guidance and support; to the Department of School & Mass Education, Government of Odisha; District Education Officers; teachers; evaluators; and all stakeholders who contributed to the successful organisation of the exhibitions at every level. Most importantly, I congratulate the young participants whose dedication and innovative spirit have made this initiative truly meaningful. I also express special thanks to Ms. Sonamika Ray, District Education Officer, Khordha, for successfully organising the State Level Exhibition.

Let this publication inspire continued action, collaboration, and commitment toward sustainable lifestyles and environmental conservation for generations to come.



(K. Murugesan)



Under the Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India, the Environment Education Programme (EEP) has been instrumental in promoting environmental awareness and action-oriented learning across the country. As part of this initiative, a State Level Model Exhibition on Sustainable Lifestyles - 2026 was successfully organised in Odisha under the EEP Programme Framework. The exhibition served as a dynamic platform to promote environmental awareness, innovation, and sustainable living practices among young learners across the state.

After obtaining due sanction and approval from the Ministry, the implementation of the programme was initiated systematically at the Block level. The process began at the Block Level, under the close coordination and guidance of the respective District Education Officers. In a remarkable statewide effort, exhibitions were organised in all 314 blocks of Odisha, ensuring inclusive

participation from every region. Each block independently conducted its Block Level Model Exhibition with financial assistance provided by the Ministry under the EEP framework.

At each Block Level Exhibition, approximately 50 innovative models were displayed, representing creative solutions aligned with the seven themes of "Sustainable Lifestyle for Environment (LiFE)." These exhibitions witnessed enthusiastic participation from students and teachers, along with strong community engagement, with an average of around 200 visitors attending each block-level event. The exhibitions not only provided a platform for students to demonstrate scientific temper and creativity but also served as awareness campaigns promoting environmentally responsible behaviour among the local community. The winners from each thematic category at the block level were then selected and promoted to the District Level Exhibition.

Subsequently, District Level Exhibitions were organised across all 30 districts of Odisha, ensuring the continuation of this structured and competitive academic progression. The best models from the block-level competitions were exhibited at the district level under the seven thematic areas of LiFE. Similar to the block-level format, approximately 50 shortlisted models were showcased in each district exhibition. Each District Level Exhibition witnessed enthusiastic public engagement, with an average of around 500 visitors attending each district-level event. These events reflected a higher degree of refinement, innovation, and practical applicability, as they represented the most promising ideas emerging from multiple blocks within each district. After careful evaluation by expert panels, the First, Second, and Third prize winners from each district were selected to participate in the State Level Model Exhibition.

In alignment with the central theme "Sustainable Lifestyle for Environment (LiFE - Lifestyle for Environment)", the State Level Exhibition brought together the First, Second, and Third prize winners from all districts of the state. These selected participants, having excelled at their respective district-level competitions, represented the finest innovative minds from across Odisha. Their participation ensured that the state-level platform reflected the diversity of ideas, creativity, and environmental commitment emerging from different regions.

Each participating team showcased thoughtfully designed models and project concepts addressing pressing environmental challenges under the seven thematic areas of LiFE. These themes emphasized practical, action-oriented solutions encouraging responsible consumption, conservation of natural resources, waste reduction, biodiversity protection, climate action, and sustainable community practices. The exhibition highlighted how students, through scientific inquiry and creative thinking, can propose locally relevant yet globally significant solutions for a sustainable future.

The models presented were not merely academic exercises but visionary prototypes reflecting the aspirations of a generation determined to "Save the Environment through Sustainable Lifestyles." The enthusiasm, scientific temperament, and environmental sensitivity demonstrated by the students reaffirmed the vital role of environmental education in shaping responsible citizens.

Recognising the significance of these innovative contributions, the synopses of all selected models have been carefully compiled and presented through this book. This publication serves as a documentation of young innovators' ideas and as an inspiration for educators, policymakers, researchers, and fellow students. It stands as a testament to the power of education, creativity, and collective responsibility in advancing the vision of a cleaner, greener, and more sustainable Odisha and nation.

Through this comprehensive three-tier structure under EEP - from Block to District to State Level - the initiative has ensured grassroots participation, transparent evaluation, and the nurturing of young environmental leaders. The State Level Model Exhibition has not only celebrated excellence but has also significantly strengthened the movement toward sustainable living by empowering youth leadership and fostering environmental stewardship for generations to come.

Block Level Model Exhibition:

A series of Block Level Model Exhibitions were organized across Odisha with the objective of nurturing environmental awareness, innovation, and sustainable lifestyle practices among school students. The programme was implemented under the guidance and supervision of the respective District Education Officers, with financial support provided through the EEP. Covering all 314 blocks of Odisha, the initiative ensured extensive geographical outreach and active participation from educational institutions across the state. Schools enthusiastically participated in the exhibitions, reflecting a growing commitment towards environmental stewardship and climate-conscious living.

Each block-level exhibition featured nearly 50 innovative models and project displays developed by students and teachers. The exhibits were based on the seven themes of Mission LiFE, including energy conservation, water conservation, waste reduction, sustainable food systems, reduction of single-use plastics, adoption of healthy lifestyles and conservation of biodiversity. Students creatively translated environmental concepts into working models, prototypes, demonstrations, and awareness materials that highlighted practical solutions to contemporary environmental challenges.

The exhibitions showcased a diverse range of ideas such as rainwater harvesting systems, renewable energy applications, waste-to-wealth innovations, eco-friendly products, biodiversity conservation initiatives, climate change adaptation measures, sustainable agriculture practices, pollution control technologies, and resource-efficient lifestyle practices. Through these exhibits, students not only demonstrated scientific creativity and technical skills but also emphasized the importance of environmental responsibility and sustainable living.

A notable feature of the programme was the enthusiastic involvement of local communities. Parents, teachers, government officials, community leaders, and members of the general public visited the exhibitions in large numbers, with an average attendance of approximately 200 visitors at each block-level event. The exhibitions served as effective awareness-generation platforms, encouraging dialogue and knowledge exchange between students and community members on critical environmental issues.

To recognize excellence and encourage healthy competition, outstanding models from each thematic category were evaluated by expert panels and awarded prizes. The winners from the block-level exhibitions were subsequently selected to represent their respective blocks at the District Level Model Exhibition, where they had the opportunity to showcase their innovations on a larger platform and compete with the best entries from across the district. This progressive selection process helped identify and promote promising environmental innovations while motivating students to continuously engage in environmental learning and action.



Pallahara Block, Angul



Talcher Block, Angul



Sohela Block, Bargarh



Bhadrak Block, Bhadrak



Titilagarh Block, Bolangir



Boudh Block, Boudh



Athagarh Block, Cuttack



Dhenkanal Block, Dhenkanal





Gumma Block, Gajapati



Aska Block, Ganjam



Rasulpur Block, Jajpur



Jharsuguda Block, Jharsuguda



Bhawanipatna Block, Kalahandi



Tikabali Block, Kandhamal



Pattamundai Block, Kendrapada



Banspal Block, Keonjhar



Begunia Block, Khordha



Bhubaneswar Block, Khordha



Laxmipur Block, Koraput



Nandapur Block, Koraput



Tiring Block, Mayurbhanj



Udala Block, Mayurbhanj



Chandahandi Block, Nabarangpur



Dabugaon Block, Nabarangpur



Nayagarh Block, Nayagarh



Sinapali Block, Nuapada



Brahmagiri Block, Puri



Nimapara Block, Puri



Satyabadi Block, Puri



Pipili Block, Puri



Raygada Block, Raygada



Jamankira Block, Sambalpur





Biramaharajapur Block, Sonepur



Sonepur Block, Sonepur



Ulunda Block, Sonepur



Balisankara Block, Sundargarh



District Level Model Exhibition:

Following the successful completion of the Block Level Model Exhibitions, District Level Model Exhibitions were organized across all 30 districts of Odisha during the financial year 2025–26 under the Environment Education Programme (EEP). These exhibitions served as the second tier of the state's comprehensive environmental education initiative, providing a larger platform for students to showcase their innovative ideas and environmental solutions.

The district-level exhibitions featured the best models selected from the block-level competitions, representing outstanding student innovations from across the respective districts. Approximately 50 shortlisted models were exhibited in each district under the seven themes of Mission LiFE (Lifestyle for Environment), focusing on sustainable consumption, resource conservation, waste reduction, biodiversity protection, climate action, water conservation, energy efficiency, and environmentally responsible lifestyles.

The exhibits demonstrated a high level of creativity, scientific understanding, and practical applicability. Students presented innovative models addressing contemporary environmental challenges through solutions such as renewable energy technologies, climate-resilient practices, rainwater harvesting systems, waste-to-wealth initiatives, plastic-free alternatives, biodiversity conservation measures, sustainable agriculture techniques, and pollution control mechanisms. Compared to the block-level exhibitions, the projects displayed at the district level showed greater refinement, technical sophistication, and potential for real-world implementation.

The exhibitions not only encouraged scientific inquiry and environmental innovation among students but also served as important awareness platforms for teachers, parents, local communities, government officials, and environmental enthusiasts. Visitors had the opportunity to interact directly with student innovators, understand the environmental significance of the models, and learn about sustainable practices that could be adopted in their daily lives.

Each district-level event witnessed enthusiastic public participation, attracting an average of 500 visitors, thereby significantly expanding the outreach and impact of environmental awareness efforts. The exhibitions fostered meaningful dialogue on environmental conservation, climate resilience, sustainable development, and the collective responsibility of citizens towards protecting natural resources.

To ensure transparency and merit-based selection, the exhibits were evaluated by expert panels comprising academicians, scientists, environmental experts, and education professionals. Based on their performance, the exhibits were evaluated by an expert panel, and the First, Second, and Third Prize winners from each district were honoured by the District Administration and distinguished guests during the valedictory ceremony. The winners were awarded cash prizes, certificates of merit, and trophies/mementos in recognition of their innovative ideas and outstanding contribution towards environmental awareness and sustainable development. In addition to the awards, the winning participants were formally invited to represent their respective districts at the State Level Model Exhibition, providing them with an opportunity to showcase their innovations on a larger platform and compete with the best environmental models from across Odisha. This recognition not only motivated the students to further develop their ideas but also encouraged greater participation in environmental innovation and sustainable lifestyle initiatives.

The District Level Model Exhibitions thus played a crucial role in identifying, nurturing, and promoting young environmental innovators while strengthening environmental education and sustainable lifestyle awareness throughout the state. They also served as an effective bridge between grassroots innovation and state-level recognition, encouraging students to become future leaders in environmental conservation and sustainable development.

District wise winner list

Sl.	District	Position	Name of Student	Class	Name of School
1	Angul	1st	Bhusan Kumar Sahu	X	Brajamohan High School, Jarada
		2nd	Debadutta Sahoo	XI	Bantala Nodal High School
		3rd	Sreeman Behera	X	Hulurisingha High School
2	Bargarh	1st	Shribanta Sahu	IX	Govt. U.G.H.S., Charpali
		2nd	Lipsa Panda	X	O.A.V., Bhatli
		3rd	Namita Sahu	IX	G.H.S. Bhandarpuri
3	Bhadrak	1st	Debajani Mohapatra	X	V.N.U.B, Kaithakola
		2nd	Harapriya Rout		Bandhagaon Nodal High School
		3rd	Tulasi Nayak		Lalajee High School, Sahada
4	Bolangir	1st	Alaka Kumar	XII	Govt. HSS Ramachandrapur
		2nd	Omprakash Naik	X	Govt. Ug High School Mirdhapali
		3rd	Pooja Budek	X	Govt. UGHS Karla
5	Boudh	1st	Bibek Bhoi	IX	PHS Sangrampur
		2nd	Debasmita Kardia	VII	Tutusingha UPS
		3rd	Swagat Mallik		Ghantapada HS
6	Cuttack	1st	Swati Sahoo	IX	Secondary Board HS, CMC
		2nd	Rudra Samrat Singh	VII	Maa Tarini Bidyapitha
		3rd	Anisha Ali	IX	Padmapur High School
7	Deogarh	1st	Priyanka Majhi	IX	GPHS, Jambunali
		2nd	Samyajit Naik	X	P. H. S Para
		3rd	Omm Prakash Nayak	X	K. H. S Kundapitha
8	Dhenkanal	1st	Prachi Patnaik	X	GC Bidyapitha, Baladiabandha
		2nd	Purnima Sahoo	IX	Mahiba Girls High School, Joranda
		3rd	Satyaprakash Sahoo	X	Mani Devi High School, Chanpur
9	Gajapati	1st	Sradhanjali Panda	IX	OAV Kaithapadar
		2nd	Sunandini Rait	IX	Govt. (SSD) Girls Higher Sec. School, K.Cpur, Gumma
		3rd	Rupali Sabar	VII	Govt- UP School, Luhagudi
10	Ganjam	1st	P. K. Panigrahy	IX	Brundaban High School, Hinjilicut
		2nd	Rajasmita Gouda	VIII	NUPS Benipalli
		3rd	Suraj Kumar Sahu	IX	Syama Sundar High School, Dengadi
11	Jagatsinghpur	1st	Rajasmita Palei	VIII	Sompur Govt. High School
		2nd	Swapneswar Rout	IX	S. K. Academy, Jagatsinghpur
		3rd	Sk Jamamuddin	X	Kanakdurga Govt HS, Piteipur

12	Jajpur	1st	Prince Priya Samal	IX	Panchayat Highschool, Rampur,Bari
		2nd	Ayushmaan Rout	VIII	OAV Jamdhar, Jajpur
		3rd	Sonali Pradhan	IX	Mahavinayak Bidyayana,Barachana
13	Jharsuguda	1st	Priyansu Sahu	IX	NAC Govt. High School, Lamtihabal
		2nd	Rahul Biswal	IX	GPHS Bhagamunda
		3rd	Niraj Prasad	X	Llr Govt High School, Brajanagar
14	Kalahandi	1st	Roshan Naik	X	Tipiguda UcchaVidyapitha
		2nd	T.Dharmesh Kaibarta	VIII	Municipal High School, Bhawanipatna
		3rd	Subhalagna Roul	VII	O.A.V, Chancharapada
15	Kandhamal	1st	Sibani Behera	VIII	Govt. Highschool, Pirikudi
		2nd	Sai Subham Mohanty	VIII	Public School, Phulbani
		3rd	Basudev Pradhan	X	Sanskrit Vidyapitha, Phulbani
16	Kendrapara	1st	Asia Khatun	VIII	Govt. Girls High School, Kendrapara
		2nd	Smrutirekha Sahoo	IX	N.C Nodal High School, Badamulbasanta
		3rd	Dibya Ranjan Panda	VIII	Govt. High School, Ichhapur
17	Keonjhar	1st	Sai Narayana Maharana	IX	Janamangala Govt. Hs, Keshdurapal
		2nd	Sushree Alisha Das	VII	L.N Govt. High School, Mahadeijoda
		3rd	Prangyarani Sahoo	IX	Jhamani High School, Denuam
18	Khurda	1st	Abhinab Parida	IX	Panchayat High School, Paikarapur
		2nd	Abhinash Baliyasingh	VIII	B.J.B Hisgh School, Khordha
		3rd	S.S. Srichandan	VI	OAV, Pichukuli
19	Koraput	1st	Anisha Naik	IX	Govt. Hs Dasamantpur
		2nd	Ashik Khilo	VIII	SSD Higher Sec. School, Sunabeda
		3rd	Roshni Behera	IX	Govt. Highschool, Semiliguda
20	Mayurbhanj	1st	Nabjeet Sasmal	IX	PM Shri MKC High School, Baripada
		2nd	Dipika Das	IX	Hrudananda High School, Tambakhuri
		3rd	Karisma Mohanta	X	Pm Shri Govt High School,Gadigan
21	Nabarangpur	1st	Naresh Pujari	X	Govt. UG High School, Bhendia
		2nd	Sai Upendra Bhatra	X	Govt. SSD Highschool, Badamasigam
		3rd	Suraj Mandal	IX	Govt. UG High School Majhidhanua
22	Nayagarh	1st	Sidhartha Sankar Sahoo	X	K.C V.P, Gania
		2nd	Subham Mahapatra	X	Govt. High School, Bahadajhola
		3rd	Animesh Rautara	IX	KN Janata High School, Sajanapada

23	Nuapada	1st	Khileswar Kharsel	IX	National Govt. High School, Nuapada
		2nd	Binayak Panigrahi	X	Pm Shri Govt. High School, Sinapali
		3rd	Bharati Patel	X	Panchayat High School Godal
24	Puri	1st	Sai Aditya Pradhan	VII	OAV, Satyabadi
		2nd	Nikhil Kumar Sing	IX	Puri Zila School, Puri
		3rd	Sai Arpita Pradhan	IX	OAV, Satyabdi
25	Rayagada	1st	K.Kalyan Durga	IX	OAV Gudari
		2nd	Swarnarupa Mahapatra	IX	Govt. Grils High School, Rayagada
		3rd	Pritam Pradhan	IX	OAV K. Singhpur
26	Sambalpur	1st	Ankita Sahu	X	Lady Lewis Girls High School
		2nd	Swapnil Badapanda	X	Govt. High School, Maneswar
		3rd	Silon Nayak	XII	Naktideul HSS
27	Sonepur	1st	Reyansh Thanapati	IX	M.R H.S Sonepur
		2nd	Nibedita Sahu	IX	UGHS Sunapali
		3rd	Smitarani Mishra	VIII	Govt. High School, Cherupali
28	Sundargarh	1st	Punam Chaudhury	IX	OAV. Lephripada
		2nd	Jeman Pruseth	X	Higher Secondary School, Luabahal
		3rd	Khusnooma Parwin	X	Panchayat High School, Kansabahal



Angul District



Bargarh District



Bolangir District



Bhadrak District



Boudh District



Cuttack District



Deogarh District



Dhenkanal District



Gajapati District



Ganjam District



Jagatsinghpur District



Jajpur District



Jharsuguda District



Kalahandi District



Kandhamal District



Kendrapara District



Keonjhar District



Khordha District



Koraput District



Mayurbhanj District



Nabarangpur District



Nuapada District



Puri District



Raygada District



Sambalpur District



Sonepur District



Sundargarh District

State Level Model Exhibition:

The State Level Model Exhibition on Sustainable Lifestyles was jointly organized by the Centre for Environmental Studies (CES) and the District Education Office (DEO), Khordha, under the Environment Education Programme (EEP) of the Ministry of Environment, Forest and



Lighting of the Lamp by the Chief Guest,
Dr. K. Murugesan, IFS, PCCF-cum-Director, CES

Climate Change (MoEF&CC), Government of India. The exhibition was held on 31 January 2026 at PM SHRI Government High School, IRC Village, Nayapalli, Bhubaneswar, under the theme “Sustainable Lifestyle for Environment”

The programme commenced with an inaugural session attended by distinguished dignitaries, education officers, representatives of CES, officials from the School & Mass Education Department, teachers, students, and invited guests. Dr. K. Murugesan, IFS, PCCF-cum-Director, CES, graced the occasion as the Chief Guest, while Dr. B. K. Patnaik, IFS, Former PCCF (Wildlife) attended as the Chief Speaker. The programme was presided over by Smt. Sonamika Ray, OES. During their addresses, the dignitaries highlighted the importance of environmental education, sustainable lifestyles, climate action, biodiversity conservation, and the vital role of youth in building an environmentally responsible society.

The exhibition was formally inaugurated through a ribbon-cutting ceremony, followed by a visit to the exhibition stalls and model displays. Around 90 innovative student models from different districts of Odisha were showcased during the event. These exhibits represented the best entries selected through the district-level competitions and demonstrated creative, practical, and scientifically sound solutions to environmental challenges. The models were developed around the seven themes of Mission LiFE and covered areas such as renewable energy, water

conservation, waste management, biodiversity protection, pollution control, climate resilience, sustainable agriculture, and eco-friendly lifestyle practices.

A panel of eminent experts evaluated the exhibits based on parameters such as innovation, originality, scientific relevance, practical applicability, presentation, and potential environmental impact. The judges interacted directly with participating students and guide teachers to understand the concepts, objectives, and benefits of each model. The exhibition also witnessed enthusiastic participation from guide teachers, District Science Supervisors, education officers, students, parents, and visitors, creating a vibrant platform for knowledge sharing, environmental learning, and exchange of innovative ideas.

The programme concluded with a grand valedictory and prize distribution ceremony attended by Dr. Pramod Kumar Panda, Principal Scientist, ICAR-IIWM, Bhubaneswar; Dr. Prasad Kumar Dash, Scientist, Odisha Biodiversity Board (OBB), Bhubaneswar; and Shri Pravat Mohan Dash, Programme Officer, Centre for Environmental Studies (CES), Bhubaneswar. During the ceremony, the State Level winners securing First, Second, and Third positions were felicitated for their exceptional innovation, creativity, scientific approach, and environmental relevance. The winners were awarded cash prizes, certificates of merit, and trophies/mementos in recognition of their outstanding contribution towards environmental awareness, sustainable development, and the promotion of Mission LiFE principles.

Recognizing the dedication, hard work, and innovative spirit of all participants who had qualified for the State Level Exhibition, every participating student was also presented with a commemorative trophy and certificate of participation. This gesture acknowledged their remarkable efforts in reaching the state-level platform and encouraged them to continue pursuing environmental innovation and leadership in their respective communities.

The State Level Model Exhibition served as a culmination of the three-tier exhibition programme conducted across Odisha during 2025-26 and emerged as an effective platform for promoting environmental awareness, scientific creativity, sustainable lifestyles, and youth leadership. The event demonstrated how education, innovation, and community engagement can work together to address environmental challenges and inspire future generations to contribute towards a cleaner, greener, climate-resilient, and sustainable Odisha.



Address by the Chief Guest,
Dr. K. Murugesan, IFS, PCCF-cum-Director, CES



Address by Smt. Sonamika Ray, OES,
District Education Officer, Khordha



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Evaluation of Models by Experts



Participants



Release of Eco-club Newsletter by the Guests



Students Receiving Awards

ANGUL DISTRICT



BHUSAN KUMAR SAHU, Class: X
Guide Teacher: Manoj Kumar Sahoo
Brajamohan High School, Jarada, Angul

REDUCE AND REUSE OF SINGLE USE PLASTICS

Introduction

With global plastic waste reaching 225 million metric tons annually, recycling alone is no longer a sufficient solution. Much of this waste, particularly single-use plastics, ends up in water bodies and landfills.

Objective

The primary goal is to minimize the presence of single-use plastics in the ecosystem. This involves promoting eco-friendly substitutes for daily items and demonstrating innovative methods to transform discarded plastic into durable construction materials and utility products.

Working Principle

The system operates through three specific interventions:

- **Substitution (Reduce):** Replacing high-waste items like plastic toothbrushes, pens, and bags with bamboo and paper-based alternatives.
- **Structural Repurposing (Reuse):** Creating Bio-Bricks by packing wrappers into bottles and constructing Plastic Roads by mixing shredded plastic with bitumen at 120°C.
- **Active Recovery:** Utilizing an Arduino-powered remote-controlled boat to mechanically collect floating plastic debris from rivers and ponds.

Benefits

- **Pollution Control:** Effectively removes plastic from aquatic and terrestrial habitats.
- **Sustainability:** Reduces the carbon footprint by using renewable materials like bamboo.
- **Economic:** Provides low-cost building materials and increases road durability through waterproof plastic-bitumen bonding.

Conclusion

This project illustrates that combating plastic pollution requires a shift from disposal to conscious reduction and creative reuse. By integrating eco-friendly products with smart collection technology, we can significantly reduce our reliance on single-use plastics and protect the planet's biodiversity.

ANGUL DISTRICT



DEBADUTTA SAHOO, Class: IX
Guide Teacher: Sasmita Bhattacharya
Bantala Nodal High School, Angul

HI-TECH TERRACE PLANTER - NEED OF MODERN WORLD

Introduction

Terrace farming is an effective way of producing food in urban areas by using unused rooftop spaces. It helps increase food production without using extra agricultural land and supports a sustainable environment.

Importance of Terrace Farming

Terrace farming helps in space optimization, reduces the carbon footprint by growing food locally, and helps regulate temperature in cities by reducing the urban heat island effect. It also supports water conservation through methods like rainwater harvesting and drip irrigation. In addition, it improves food security, promotes biodiversity, and encourages organic farming.

Challenges in Terrace Farming

Despite its advantages, terrace farming faces challenges such as structural load, water drainage issues, limited soil depth, harsh weather exposure, maintenance difficulties, and pest management.

Hi-Tech Terrace Planter Prototype

- **Lightweight Design:** Made from lightweight materials for easy handling and installation on terraces.
- **Eco-Friendly Construction:** Manufactured using recycled plastic waste, making it durable and environmentally friendly.
- **Sunlight Protection:** Provides protection to plants from excessive heat and intense sunlight.
- **Lightweight Soil Mix:** Uses a specially prepared lightweight soil mixture suitable for rooftop gardening.
- **Acid Rain Detection:** Equipped with a system to detect acid rain and help protect plants.
- **Automatic Manure Addition:** Adds manure or nutrients whenever required to support healthy plant growth.

Conclusion

This hi-tech terrace planter provides a complete solution for modern terrace farming. It supports organic farming, efficient resource use, and sustainable urban agriculture, making it highly suitable for the needs of the modern world.

ANGUL DISTRICT



SREEMAN BEHERA, Class: X
Guide Teacher: Kirtan Sahu
Hulurisingha High School, Angul

POLLUTION CONTROL FROM WASTE WATER

Introduction

Rapid urbanization and increasing vehicles have increased dust pollution on roads, which affects air quality and human health. At the same time, air conditioners produce condensate water, which is usually wasted. This project proposes using this wastewater to reduce road dust pollution by spraying it near vehicle wheels.

Basic Principle

The project works on the water-based dust suppression principle. When water is sprayed on dusty surfaces, dust particles absorb moisture, become heavier, and settle down instead of spreading in the air.

Working of the Project

Condensate water from the vehicle's AC drain pipe is collected in a small storage tank. When the vehicle moves on dusty roads, this stored water is sprayed through nozzles near the front wheels. The sprayed water settles dust particles and reduces airborne dust.

Advantages

- Reuses AC wastewater
- Reduces dust pollution
- Saves freshwater
- Eco-friendly and cost-effective
- Simple system for vehicles

Applications

This system can be used in passenger vehicles, buses, construction vehicles, mining vehicles, and industrial transport vehicles traveling on dusty roads.

Conclusion

This project shows an innovative way to reuse AC condensate water for dust pollution control. It helps reduce air pollution while conserving water, making it a practical and environmentally friendly solution.

BARGARH DISTRICT



SHRIBANTA SAHU, Class: IX
Guide Teacher: Niranjana Padhan
Govt. U.G. High School, Charpali, Bargarh

SMART WATER MANAGEMENT SYSTEM

Introduction

This project introduces a "Smart Water Management System" that integrates traditional conservation practices with modern technology to optimize usage and preserve our ecological balance.

Objective

The primary goal is to minimize water wastage and promote sustainability across residential, agricultural, and industrial sectors. The project aims to reduce dependence on groundwater by implementing harvesting, automated irrigation, and effective filtration systems for water reuse.

Working Principle

The system employs various mechanical and electronic methodologies:

- **Automation:** A Water Level Alarm prevents tank overflow, while an Automatic Irrigation System uses sensors to water plants only when soil moisture is low.
- **Precision Delivery:** Drip Irrigation provides water directly to roots, eliminating evaporation loss.
- **Filtration & Treatment:** Greywater is filtered for reuse, while STPs treat wastewater for industrial purposes.
- **Physical Barriers:** Check Dams and Watershed Management (like contour bunding) slow down runoff to recharge aquifers and prevent soil erosion.

Benefits

- **Resource Efficiency:** Reduces water consumption through automated monitoring and drip irrigation.
- **Economic:** Lowers water costs and supports farming during dry periods with rainwater harvesting and check dams.
- **Environmental:** Prevents soil erosion and encourages sustainable energy use, such as hydropower and biogas.

Conclusion

The Smart Water Management System proves that the water crisis can be managed through conscious integration of technology and nature. By treating wastewater as a resource and automating conservation, we can ensure a water-secure and sustainable future for all.

BARGARH DISTRICT



LIPSA PANDA, Class: X
Guide Teacher: Shrabani Padhi
Odisha Adarsha Vidyalaya, Bhatli, Bargarh

SMART IRRIGATION SYSTEM

Introduction

In the era of automation, technology plays a vital role in optimizing resource management. An automatic plant watering system is designed to maintain optimal soil moisture without constant human intervention, ensuring healthy growth through precision hydration.

Objective

The primary goal is to develop an automated irrigation system that responds to real-time soil conditions. It aims to reduce manual labour, conserve water by preventing over-irrigation, and ensure plants receive the exact amount of moisture required for peak productivity.

Working Principle

The system operates on a feedback loop controlled by an Arduino microcontroller. A Soil Moisture Sensor continuously monitors the ground's hydration levels. When moisture drops below a pre-defined threshold, the Arduino triggers a Relay Module to activate the water pump. Once the sensor detects sufficient moisture, the signal is cut, and the pump deactivates. A 16×2 LCD display is often integrated to provide real-time status updates on soil conditions.

Benefits

- **Water Conservation:** Eliminates wastage by providing water only when necessary.
- **Health & Growth:** Prevents root rot from overwatering and wilting from neglect.
- **Efficiency:** Ideal for greenhouses, remote agricultural fields, and home gardens where manual watering is impractical.

Conclusion

The Smart Irrigation System is a simple yet powerful solution for modern agriculture. By merging sensor technology with microcontrollers, it supports sustainable farming practices, reduces human effort, and ensures environmental preservation through smarter water use.

BARGARH DISTRICT



NAMITA SAHU, Class: IX
Guide Teacher: Arindam Mohanty
Girls High School, Bhandarpuri, Bargarh

BLUE SOCIETY: INTEGRATED WATER & ENERGY MANAGEMENT

Introduction

Freshwater is limited, making efficient water management essential. The Blue Society model integrates rainwater harvesting, greywater recycling, and renewable energy to create a sustainable and self-reliant water management system.

Objective

To achieve water self-sufficiency by harvesting rainwater, reusing wastewater, generating energy from wastewater flow, and using solar energy for efficient water purification.

Working Principle

The "Blue Society" operates through a series of technical innovations:

- **Energy Harvesting:** The kinetic energy of flowing wastewater drives small dynamos to power sensors and LEDs.
- **Smart Irrigation:** Rooftop rainwater is funneled directly into vertical gardens and precision drip systems.
- **Vedic Filtration & Distillation:** Domestic wastewater is treated through a Vedic filtration system for flushing. For drinking water, a solar parabolic concentrator heats wastewater, using distillation to produce pure, condensed water vapor.
- **Waste Prevention:** Automatic sensor taps are installed to eliminate human error in water usage.

Benefits

- **Resource Efficiency:** Can reduce freshwater consumption by 40-60%.
- **Sustainability:** Operates on clean solar and hydro-kinetic energy, reducing the carbon footprint.
- **Water Security:** Ensures a reliable water supply for urban societies even during peak summer or droughts.

Conclusion

The Blue Society model proves that urban living can be sustainable when water is treated as a reusable asset. By integrating ancient filtration wisdom with modern solar and sensor technology, we can secure water resources and protect the environment for future generations.

BHADRAK DISTRICT



DEBAJANI MOHAPATRA, Class: X
Guide Teacher: Sridhar Swain
V.N.U.B, Kaithakola, Bhadrak

USES OF SINGLE-USE PLASTICS

Introduction

Plastic is a non-biodegradable pollutant that harms the environment and living beings. This project proposes innovative solutions for effective plastic waste management and a cleaner, more sustainable future.

Objective

The primary goal is to provide a practical framework to eliminate single-use plastics from the environment. By focusing on sustainable alternatives and proper waste management, the project aims to reduce pollution levels, safeguard public health, and support the government's mission to create a plastic-free society.

Working Principle

The project operates on the principle of Environmental Restoration and Substitution:

- **Pollution Mitigation:** It identifies the harmful chemical release from burning plastics and provides safer disposal alternatives.
- **Awareness & Compliance:** It bridges the gap between government policy and market reality by promoting eco-friendly substitutes that are as convenient as plastic but biodegradable.
- **Disease Prevention:** By removing toxins from the air and water, the system directly reduces the environmental triggers associated with modern health crises.

Benefits

- **Environmental Health:** Drastically reduces toxins in the air, soil, and water systems.
- **Public Wellness:** Lowers the risk of chronic diseases caused by microplastics and toxic fumes.
- **National Progress:** Promotes a cleaner, healthier environment which is essential for sustainable economic development.

Conclusion

The eradication of single-use plastic is not just a policy requirement but a necessity for human survival. By implementing the unique strategies outlined in this project, we can significantly reduce the incidence of pollution-related diseases

BHADRAK DISTRICT



HARAPRIYA ROUT, Class: IX
Guide Teacher: Purna Chandra Baral
Bandhagaon Nodal High School, Bhadrak

WASTE MANAGEMENT IN SCHOOL PREMISES

Introduction

Waste consists of items we no longer use and discard. When left unmanaged, waste pollutes our surroundings and contributes to the spread of various diseases. Effective waste management is essential for a healthy environment. This project showcases an Eco-Model for managing school-level waste and other materials efficiently.

Scientific Principle

The project is built on two core principles:

- **The 5'R' Framework:** Identifying different types of waste and applying the five pillars-Refuse, Reduce, Reuse, Recycle, and Repurpose.
- **Pollution Mitigation:** Aiming to minimize environmental pollution and health impacts through a structured hierarchy of waste disposal methods.

The 5'R' Strategy

The model operates through five distinct scientific approaches:

- **Refuse:** Actively avoiding non-biodegradable items like single-use plastics, polythene, and thermocol in favor of paper and metal alternatives.
- **Reduce:** Installing smart technology, such as sensor-based taps, to significantly lower water and energy consumption.
- **Reuse:** Repurposing items like coconut shells and pencil shavings into Teaching Learning Materials (TLM) and school decor.
- **Recycle:** Segregating scrap-such as iron, wood, and plastic-in dedicated bins for industrial reprocessing.
- **Repurpose:** Converting kitchen and garden waste into Vermi-compost for the school garden, while transforming broken ceramics into creative flower vases.

Conclusion

Implementing this hierarchy reduces health risks and teaches students practical environmental stewardship. Coupled with Solar Energy and Rainwater Harvesting, this model transitions schools into self-sufficient ecosystems.

BHADRAK DISTRICT



TULASI NAYAK, Class: IX
Guide Teacher: Krishnarani Parida
Lalajee High School, Sahada, Bhadrak

FLOW FOR TOMORROW - HYDRA SAVES

Introduction

Water is a limited resource, with less than 1% available for human use. This project, "Flow for Tomorrow," promotes water conservation to ensure a sustainable future for people and ecosystems.

Objective

The primary goal is to implement a diverse range of water harvesting and conservation techniques. The project aims to capture alternative water sources- such as fog and AC runoff-while enhancing groundwater recharge to balance today's consumption with tomorrow's needs.

Working Principle

The system integrates several mechanical and natural methods:

- **Atmospheric & Appliance Capture:** Fog collection nets intercept moisture to provide a non-electric water source, while AC wastewater is collected (generating up to 15 gallons daily) for non-potable use.
- **Groundwater Recharge:** Pervious concrete and recharge pits allow rainwater to infiltrate the soil and replenish aquifers.
- **Evaporation Control:** Shade and mulching retain soil moisture, while skimmers utilize micro-bubbles to trap debris in water bodies.
- **Rainwater Harvesting:** Captures and purifies rooftop runoff for immediate reuse.

Benefits

- **Environmental:** Recharges depleted groundwater and protects local ecosystems.
- **Efficiency:** Utilizes wasted energy and runoff from central AC units.
- **Sustainability:** Provides low-cost, decentralized water sources without requiring high energy consumption.

Conclusion

"Flow for Tomorrow" demonstrates that water conservation is a multi-front effort. By combining high-tech solutions like fog nets with simple practices like mulching, we can secure a water-positive future and protect our planet's most precious resource.

BOLANGIR DISTRICT



ALAKA KUMARI, Class: XII
Guide Teacher: Dibya Kishor Padhan
Govt. Higher Sec. School, Ramachandrapur, Bolangir

SAMRIDDHI: SMART INTEGRATED FARM FOR SUSTAINABLE RURAL LIFESTYLES

Introduction

SAMRIDDHI is a smart integrated farming model that promotes sustainable and self-reliant rural living. It combines activities such as dairy, poultry, beekeeping, and mushroom cultivation to create an eco-friendly and stable livelihood system

Objective

To develop a self-reliant and sustainable farming system by integrating smart technologies, reducing agricultural risks, and empowering women and rural youth with IoT-based skills.

Working Principle

The model operates as a Closed-Loop Integrated System utilizing a "Waste-to-Wealth" cycle:

- **Resource Integration:** Waste from one sector becomes fuel for another. For example, poultry droppings can fertilize crops, and crop residues can serve as cattle feed.
- **Tech-Driven Management:** The farm is supported by solar energy and IoT-based automation for smart irrigation and environmental monitoring.
- **Digital Interface:** Farmers use the SAMRIDDHI PATHA mobile application for data analysis, real-time monitoring, and market connectivity.

Benefits

- **Economic:** Multiple income streams (fishery, dairy, honey, etc.) reduce dependence on single-crop harvests and lower financial risk.
- **Environmental:** Achieves a zero-waste footprint by utilizing renewable energy and recycling all organic byproducts.
- **Technical & Social:** Introduces automation to rural areas while promoting gender equality and youth engagement in agriculture.

Conclusion

SAMRIDDHI demonstrates that integrating technology with nature can create a sustainable, self-reliant, and prosperous rural ecosystem while ensuring economic growth and environmental conservation for future generations.

BOLANGIR DISTRICT



OMPRAKASH NAIK, Class: X
Guide Teacher: Suryakanta Baral
Govt. UG High School, Mirdhapali, Bolangir

AI-BASED SMART FARMING

Introduction

AI-Based Smart Farming uses sensors and automation to improve crop production by monitoring field conditions in real time. It helps farmers conserve water, increase yields, and promote sustainable agriculture.

Objective

To improve agricultural productivity through smart automation, precision irrigation, AI-based crop protection, and efficient greenhouse management while conserving resources and promoting sustainable farming.

Working Principle

The system functions as an automated neural network for the farm, governed by an Arduino Uno:

- **Automated Irrigation:** A Rain Sensor detects precipitation; the Arduino then toggles a mini water pump to prevent over-saturation or dehydration.
- **Climate Regulation:** To mitigate excess heat, a mini fan activates automatically to maintain an ideal micro-climate for the crops.
- **Crop Protection:** A gear motor operates an automated scarecrow to deter birds, while a buzzer provides audio alerts for farm security.
- **System Monitoring:** An LED monitor provides a live interface, displaying the system's operational status and environmental data.

Benefits

- **Resource Efficiency:** Significant reduction in water consumption and manual labor.
- **Increased Yield:** Maintains optimal growing conditions, reducing crop loss due to weather or pests.
- **Sustainability:** Supports a sustainable lifestyle by utilizing smart technology to prevent food wastage and protect soil health.

Conclusion

AI-Based Smart Farming represents the future of sustainable agriculture. By overcoming the limitations of manual farming through intelligent automation, this system makes farming more resilient, efficient, and profitable, ensuring food security in a changing climate.

BOLANGIR DISTRICT



POOJA BUDEK, Class: X
Guide Teacher: Debashis Bag
Govt. UG High School, Karla, Bolangir

ECO FRIENDLY POWER PRODUCTION SYSTEM

Introduction

With growing energy demand, sustainable power generation has become essential. This project explores five innovative methods to harvest clean energy from everyday surroundings.

Objective

To develop a multi-source energy harvesting system using wind, solar, pressure, heat, and chemical energy for sustainable and decentralized power generation.

Working Principles

The project integrates five distinct scientific phenomena:

- **Wind Kinetics:** Vertical Wind Turbines made of carbon fiber capture low-speed wind along roadsides. A dynamo converts the mechanical rotation into electricity via electromagnetic induction.
- **Photoelectric Effect:** Solar Panels utilize silicon cells to convert sunlight directly into DC electricity, ideal for bus stops and vehicle charging stations.
- **Piezoelectric Effect:** Piezoelectric Sensors installed under busy footpaths generate a charge when subjected to mechanical stress (footsteps or vehicle weight).
- **Seebeck Effect (Thermoelectricity):** Using a temperature gradient between two metals, this system converts heat-generated from burning city waste-directly into voltage.
- **Electrochemical Conversion:** Using an Anode and Cathode within an electrolyte, chemical reactions trigger a flow of electrons to produce a steady electric current.

Benefits

- **Energy Security:** Provides multiple pathways for power, ensuring supply even when the sun isn't shining or the wind isn't blowing.
- **Environmental Protection:** Reduces reliance on fossil fuels and helps manage city waste through thermoelectric conversion.

Conclusion

This project demonstrates that integrating multiple renewable energy technologies can reduce the energy crisis and support a cleaner, greener, and self-reliant future.

BOUDH DISTRICT



BIBEK BHOI, Class: IX
Guide Teacher: Ugrasen Behera
Panchayat High School, Sangrampur, Boudh

GREEN ENERGY

Introduction

Green energy refers to electricity generated from renewable and environmentally friendly sources such as solar and wind energy. As energy demand continues to rise, adopting clean energy solutions has become essential to reduce pollution, conserve natural resources, and ensure a sustainable future.

Objective

The objective of this project is to promote the use of renewable energy sources for sustainable development. It aims to generate electricity using solar and wind energy, reduce dependence on fossil fuels, encourage energy conservation through smart automation, and create awareness about clean energy technologies.

Working Principle

The model generates electricity through solar panels and a helical wind turbine. Solar panels convert sunlight into electrical energy, while the wind turbine produces power from wind. Smart sensors automatically operate streetlights and other electrical devices only when required, minimizing energy wastage. The electricity produced can be stored and utilized efficiently for various applications.

Benefits

This project provides clean, renewable, and pollution-free energy while reducing electricity consumption and dependence on conventional fuels. It conserves natural resources, lowers long-term energy costs, promotes smart energy management, and supports sustainable environmental development.

Conclusion

The Green Energy project demonstrates that integrating renewable energy sources with smart automation can provide an efficient, reliable, and eco-friendly energy system. It encourages the adoption of clean technologies, reduces environmental pollution, and contributes to building a greener, energy-secure, and sustainable future.

BOUDH DISTRICT



DEBASMITA KARDIA, Class: VII
Guide Teacher: Smiti Madhusmita Sahu
Tutusingha UP School, Boudh

SUSTAINABLE HOUSE FOR ATMA NIRBHAR BHARAT

Introduction

A sustainable house is a residence engineered to significantly minimize environmental impact. In the context of Atma Nirbhar Bharat (Self-Reliant India), these homes represent more than just eco-friendly living; they are a blueprint for resource independence.

Objective

The primary goal is to create a self-sufficient living space that prioritizes resource conservation. This project demonstrates how a home can become a "mini-utility" by generating its own power, managing its own waste, and harvesting its own water-thereby reducing the overall carbon footprint and household expenditure.

Working Principle

A sustainable house operates through several interconnected eco-systems:

- **Energy Independence:** High-efficiency Solar PV panels and solar water heaters harness sunlight to achieve net-zero electricity consumption.
- **Water Security:** A Rainwater Harvesting (RWH) system captures rooftop runoff for groundwater recharge or domestic use, while low-flow fixtures prevent waste.
- **Passive Cooling:** The design utilizes reflective "cool-roof" paints and strategic Natural Ventilation to maintain comfortable temperatures without energy-intensive air conditioning.
- **Eco-Materials:** Construction employs local, low-carbon materials like stabilized earth blocks or bamboo, reducing the home's total embodied energy.

Conclusion

Sustainable housing is the cornerstone of a self-reliant nation. By transforming our homes into efficient, resource-generating units, we protect our environment while building economic stability. This model proves that a "Green Home" is not a luxury, but a practical necessity for a prosperous and sustainable future.

BOUDH DISTRICT



SWAGAT MALLIK, Class: X
Guide Teacher: Rakesha Kumar Bhoi
Ghantapada High School, Boudh

ELECTRICITY GENERATION USING PIEZO SENSORS

Introduction

As conventional energy resources deplete, harvesting "waste energy" from human locomotion offers a sustainable alternative. In densely populated areas like railway stations and malls, millions of footsteps generate significant bio-energy. This project utilizes piezoelectric technology to convert this mechanical pressure into a functional power source for urban infrastructure.

Objective

The primary goal is to harvest electricity from footsteps using piezoelectric sensors. The project aims to create a self-sustaining system that stores this energy in a rechargeable battery and utilizes an LDR (Light Dependent Resistor) to automatically control street lights, ensuring maximum energy efficiency.

Working Principle

The system operates on the Piezoelectric Effect, where mechanical strain is converted into electrical energy. Piezo sensors are arranged in a parallel configuration beneath a walkway. When a person walks over them, the pressure generates a voltage. This current is directed to a 12V rechargeable battery for storage. A control circuit, featuring a transistor and an LDR, acts as a smart switch, activating the LED street lights only when ambient light levels drop (at night).

Benefits

- **Sustainable:** Uses human bio-energy that would otherwise be wasted.
- **Eco-Friendly:** Provides clean, non-conventional energy with zero emissions.
- **Smart Automation:** Reduces electricity waste through sensor-based lighting control.

Conclusion

Electricity generation via piezo sensors is a promising solution for energy-stressed nations. By transforming crowded spaces into power plants, this technology provides a blueprint for smart, self-sufficient cities that prioritize renewable energy and automated conservation.

CUTTACK DISTRICT



SWATI SAHOO, Class: IX
Guide Teacher: Smrutilipsha Sahoo
Secondary Board High School, Cuttack Municipal Corporation

BEST OUT OF WASTE

Introduction

Best Out of Waste promotes sustainable living by transforming discarded materials into useful and creative products. It encourages waste reduction, resource conservation, and environmental awareness.

Objective

The project aims to reuse waste materials such as plastic, paper, and glass to reduce solid waste, conserve resources, and promote recycling through creative innovation.

Working Principle

This project operates on the Hierarchy of Waste Management, prioritizing Reuse over industrial recycling:

- **The 3R Strategy:** Emphasizing Reduce, Reuse, and Recycle. While recycling is an industrial process that demands significant energy for melting and reshaping, "Reuse" requires zero energy and immediately diverts waste from the environment.
- **Creative Upcycling:** Household waste such as cardboard, plastic bottles, glass jars, and straws are repurposed into:
 - ↳ **Decorative Items:** Enhancing aesthetics without new consumption.
 - ↳ **TLM (Teaching Learning Materials):** Low-cost educational aids for classrooms.
 - ↳ **Hydroponic Systems:** Utilizing plastic containers for soil-less farming.

Benefits

- **Environmental:** Lowers the carbon footprint by avoiding the energy-intensive manufacturing of new products.
- **Economic:** Provides high-value tools and decor at zero cost using locally available materials.
- **Educational:** Encourages a shift in perspective, teaching that innovation does not always require expensive resources.

Conclusion

This project shows that reusing waste through creativity helps protect the environment. Best Out of Waste encourages sustainable living by turning waste into valuable and useful products.

CUTTACK DISTRICT



RUDRA SAMRAT SINGH, Class: VII
Guide Teacher: Debjani Choudhory
Maa Tarini Bidyapitha, Cuttack

MILLETS: TOP NOTCH FOOD FOR SUSTAINABLE LIFE

Introduction

Millets are nutritious, climate-resilient grains that require less water and can grow in harsh conditions. This project highlights the importance of millets as a healthy and sustainable food source.

Objective

The project aims to promote millets as a nutritious, eco-friendly crop that ensures food security, conserves natural resources, and supports sustainable agriculture.

Working Principle

The promotion of millets is based on the principles of Climate Resilience and Resource Efficiency:

- **Water Conservation:** Millets are highly efficient, requiring only 300-400 mm of rainfall for a full growth cycle, compared to the 2500 mm required by water-intensive crops like rice.
- **Hardiness:** They are naturally resistant to pests, droughts, and extreme temperatures, reducing the need for chemical pesticides and intensive irrigation.
- **Soil Health:** Millet cultivation helps restore soil fertility and supports biodiversity, acting as a natural solution for land conservation.

Benefits

- **Environmental:** Drastically reduces the burden on freshwater resources and remains productive despite unpredictable climate shifts.
- **Nutritional:** Millets are gluten-free and rich in Iron, Calcium, and Dietary Fiber.
- **Health Management:** They have a low glycemic index, which helps regulate blood sugar levels (diabetes management), aids in digestion, and assists in blood pressure and weight regulation.

Conclusion

Millets represent an ideal intersection of human health and environmental protection. By requiring minimal resources to produce maximum nutrition, they offer a viable solution to food security and climate challenges.

CUTTACK DISTRICT



ANISHA ALI, Class: IX
Guide Teacher: Amrita Panda
Padmapur High School, Cuttack

HEALTHY LIFESTYLE

Introduction

A healthy lifestyle promotes physical, mental, and social well-being while supporting environmental sustainability. This project highlights how healthy habits contribute to a better quality of life and a sustainable future.

Objective

The project aims to promote healthy living by encouraging balanced nutrition, regular exercise, mental well-being, and eco-friendly practices for a healthier society and environment.

Working Principle

The project operates on the principle of Integrated Wellness, which links individual choices to global outcomes:

- **Nutritional Balance:** Prioritizing a balanced diet rich in natural, local foods to reduce the carbon footprint associated with processed goods.
- **Physical & Mental Synergy:** Encouraging regular exercise, yoga, and cycling as carbon-neutral ways to boost immunity and mental clarity.
- **Eco-Hygienic Practices:** Implementing waste reduction and clean environment strategies to prevent the spread of diseases and protect local ecosystems.
- **Sustainable Living:** Adopting simple, daily eco-friendly habits that align with SDG-3 (Good Health and Well-being).

Benefits

- **Personal Health:** Strengthens the immune system, improves mental health, and prevents chronic lifestyle diseases.
- **Environmental:** Reduces pollution and waste through conscious consumption and green living.
- **Social:** Promotes a culture of cleanliness and activity that inspires community-wide sustainable development.

Conclusion

A healthy lifestyle benefits both people and the planet. By adopting nutritious habits, regular physical activity, and sustainable practices, we can build a healthier and greener future.

DEOGARH DISTRICT



SAMYAJIT NAIK, Class: X
Guide Teacher: Panchanan Dehury
Panchayat High School, Para, Deogarh

INDUSTRIES WASTE MANAGEMENT

Introduction

Industries support economic growth but also generate waste and harmful gases that pollute air, water, and soil. This project highlights the effect of industrial waste management to reduce pollution and protect the environment.

Objective

The project aims to create awareness about industrial waste, reduce CO₂ emissions through proper treatment methods, and promote recycling and sustainable waste management.

Principle

Industries release carbon dioxide and other gases through chimney pipes. Instead of directly releasing these gases into the atmosphere, they can be treated using filtering systems. For example, wet cotton or similar absorbent materials can be placed at the top of chimney pipes. When carbon dioxide mixes with water in the wet cotton, it forms carbonic acid. This carbonic acid gets trapped in the wet cotton and does not escape easily into the atmosphere, thereby reducing CO₂ pollution. Such treatment methods can help in lowering greenhouse gas emissions and reducing global warming.

Benefits

- **Reduces Pollution:** Minimizes air, water, and soil pollution through proper waste management.
- **Controls Global Warming:** Reduces greenhouse gas emissions by promoting recycling and scientific waste disposal.
- **Conserves Natural Resources:** Encourages recycling and reuse, reducing the need for raw materials.
- **Protects Public Health:** Prevents the spread of diseases by ensuring safe collection and disposal of waste.
- **Promotes Wastewater Treatment:** Encourages treatment of wastewater in treatment plants before discharge or reuse.

Conclusion

Industrial waste can harm the environment if not managed properly. Treating and recycling waste helps reduce pollution and ensures sustainable development for a cleaner future.

DEOGARH DISTRICT



OMM PRAKASH NAYAK, Class: X
Guide Teacher: Padmini Samal
Kundapitha High School, Kundapitha, Deogarh

RESPONSIBLE CONSUMPTION AND PRODUCTION (SDG 12)

Introduction

Sustainable development promotes economic growth while protecting the environment. This project demonstrates an Integrated Farming System (IFS) that efficiently recycles resources to create a self-sustaining and eco-friendly household.

Objective

The project aims to develop a self-reliant farming model by integrating crops, livestock, and renewable energy to improve productivity, conserve resources, and promote sustainable living.

Working Principle

The IFS model operates on a Closed-Loop Recycling system:

- **Energy & Waste:** Solar panels provide carbon-free electricity, while a biogas unit converts cattle dung into clean cooking fuel and organic manure.
- **Symbiotic Integration:** Beehives near sunflower fields enhance pollination, and poultry-cum-pisciculture allows poultry droppings to serve as natural fish feed.
- **Eco-Friendly Farming:** Trap cropping (using marigold and mustard) naturally deters pests, reducing chemical use. Organic waste is processed into vermicompost to restore soil fertility.
- **Climate Resilience:** Cultivation of millets and multipurpose trees (Moringa, Coconut) ensures food security and nutrition with minimal water.

Benefits

- **Resource Efficiency:** Minimizes waste by turning byproducts of one sector into inputs for another.
- **Environmental:** Reduces carbon emissions through renewable energy and prevents chemical runoff by using organic pest control.
- **Economic:** Diversified income from milk, honey, fish, and crops ensures year-round financial stability.

Conclusion

This project demonstrates that integrating farming, renewable energy, and waste recycling promotes responsible resource use. The Integrated Farming System (IFS) supports sustainable development and helps build a self-reliant and eco-friendly future.

DHENKANAL DISTRICT



PRACHI PATTNAYAK, Class: X
Guide Teacher: Padmini Dhanwar
Gourang Charan Bidyapitha, Baladiabandha, Dhenkanal

INTEGRATED JAIVIK -JAL-URJA-CONSERVATION

Introduction

Integrated Jaivik-Jal-Urja Conservation is a sustainable model that combines organic farming, water conservation, and renewable energy. It promotes efficient resource use, waste recycling, and environmental protection for a self-reliant future.

Objective

The main objective of the Integrated Jaivik-Jal-Urja Conservation model is to promote sustainable and eco-friendly practices by efficiently using natural resources. It aims to conserve water, generate renewable energy, reduce waste through recycling, and encourage organic farming.

Working Principle:

The model works on an integrated cycle where organic waste is converted into bio-gas in a digester tank, producing energy for small applications. The remaining waste is used for vermicomposting to create organic manure. Solar panels generate additional electricity, while water is conserved and reused through proper management systems. All components are interconnected, forming a continuous cycle of resource utilization and conservation.

Benefits:

This model helps in reducing pollution, conserving water and energy, and promoting the use of renewable resources. It improves soil fertility through organic manure, reduces dependency on chemical fertilizers, and encourages waste recycling. Overall, it is a cost-effective, sustainable solution suitable for both rural and urban areas.

Conclusion

The Integrated Jaivik-Jal-Urja Conservation model demonstrates how natural resources can be efficiently utilized through a cyclic and sustainable approach. It helps in conserving energy, water, and soil while reducing waste. This model can be widely promote environmental protection and sustainable development

DHENKANAL DISTRICT



PURNIMA SAHOO, Class: IX
Guide Teacher: Truptimayee Sahoo
Mahima Girls High School, Joranda, Dhenkanal

BIO-PLASTIC: SUSTAINABLE SITE SYSTEM UNDER MISSION LIFE

Introduction

Bioplastics are biodegradable materials made from renewable natural resources such as cornstarch and vegetable oils. They offer an eco-friendly alternative to conventional plastics and help reduce environmental pollution.

Objective

The project aims to develop a sustainable alternative to plastic using natural materials, reducing plastic waste and promoting environmentally friendly products.

Working Principle

The creation of bioplastic involves a thermal chemical reaction known as polymerization:

- **The Mixture:** A precise combination of cornstarch (the polymer base), water (solvent), vinegar (an acid catalyst to break down starch chains), and glycerin (a plasticizer to provide flexibility) is prepared.
- **Thermal Reaction:** The mixture is heated and stirred continuously. As the temperature rises, the starch molecules reorganize into a thick, gel-like state.
- **Solidification:** Once the gel is spread thin and dried for 24 hrs, the moisture evaporates, leaving behind a firm, flexible, and usable bioplastic film.

Benefits

- **Environmental Protection:** Significantly reduces soil and water pollution as the material is compostable.
- **Resource Efficiency:** Conserves non-renewable petroleum resources by utilizing agricultural byproducts.
- **Versatility:** These materials are highly applicable in eco-friendly packaging, agricultural mulching films, and even specialized medical healthcare products.

Conclusion

Bioplastics represent a critical advancement in the journey toward sustainable development. By providing a viable alternative to toxic synthetic polymers, this system aligns perfectly with the global "Mission Life" initiative.

DHENKANAL DISTRICT



SATYAPRAKASH SAHOO, Class: X
Guide Teacher: Premananda Sahu
Manidevi High School, Chainpur, Dhenkanal

SMART GARDENING WITH ENERGY CONSERVATION

Introduction

Traditional gardening often involves significant water wastage and manual labor. This project introduces an automated "Smart Garden" that leverages sensor technology and renewable energy to create a highly efficient, self-regulating green space suitable for modern urban living.

Objective

The primary goal is to optimize water usage and reduce human intervention in plant care. By integrating moisture-sensing technology and solar power, the project aims to promote energy conservation while ensuring plants receive the precise amount of hydration needed for healthy growth.

Working Principle

The system is built on an automated feedback loop. A soil moisture sensor continuously monitors the dampness of the earth. When the moisture level drops below a pre-set threshold, a signal is sent to a microcontroller that activates a submersible water pump. To ensure sustainability, the entire circuit is powered by a solar panel that charges a battery during the day. Once the soil reaches optimal hydration, the sensor triggers the system to automatically shut off the pump.

Benefits

- **Resource Efficiency:** Prevents over-watering and significantly reduces water consumption.
- **Energy Independence:** Operates on clean solar energy, eliminating electricity costs.
- **Convenience:** Allows for healthy plant maintenance even when the owner is away.

Conclusion

Smart Gardening represents the perfect intersection of nature and technology. By automating essential tasks with renewable energy, this model provides a practical solution for sustainable agriculture and eco-friendly home gardening in an increasingly resource-scarce world.

GAJAPATI DISTRICT



SRADHANJALI PANDA, Class: IX
Guide Teacher: Santosh Kumar Choudhury
Odisha Adarsha Vidyalaya, Kaithapadar, Gajapati

ENERGY CONSERVATION (SOUND/PRESSURE INTO ELECTRIC)

Introduction

With increasing energy demand and the depletion of conventional fuels, alternative energy sources have become essential. This project demonstrates how wasted sound and pressure energy can be converted into electricity for useful applications such as street lighting, promoting clean and sustainable energy generation.

Objective

- To convert sound and pressure energy into electrical energy.
- To demonstrate the use of this energy for powering LED street lights.
- To understand the working of piezo sensors and speakers in energy conversion.

Working Principle

This project works on the principle of energy conversion. Sound vibrations are captured by a speaker, which converts them into small electrical signals. Pressure applied on a piezo sensor (such as footsteps or tapping) also produces electrical energy. The generated AC signals are converted into DC using diodes and filtered using a capacitor. The stored energy is then used to power LEDs. An Arduino Uno controls the system and an LDR sensor automatically switches the LED streetlight ON at night and OFF during the day.

Benefits

- Utilizes waste sound and pressure energy.
- Helps in energy conservation.
- Eco-friendly and non-polluting.

Conclusion

This project demonstrates that wasted sound and pressure energy can be converted into useful electricity. It promotes energy conservation, reduces energy wastage, and encourages the use of innovative technologies for a cleaner and more sustainable future.

GAJAPATI DISTRICT



SUNANDINI RAITA, Class: IX
Guide Teacher: Sai Prasad Nanda

ALL IS WELL

Introduction

A Sustainable Food System ensures the production of healthy food while conserving natural resources and protecting the environment. The project "ALL IS WELL" demonstrates the integration of crop cultivation, livestock rearing, waste recycling, renewable energy, and efficient resource management to create a self-sustaining agricultural ecosystem.

Objectives

- To promote sustainable and eco-friendly food production.
- To demonstrate integrated farming practices.
- To reduce waste through recycling and resource conservation.
- To enhance food security and nutritional well-being.
- To create awareness about climate-resilient agriculture.

Benefits

- Produces healthy and nutritious food sustainably.
- Reduces environmental pollution through proper waste management.
- Conserves water, soil, and energy resources.
- Increases farmers' income through integrated farming activities.
- Promotes self-reliance and long-term food security.

Conclusion

The "ALL IS WELL" model highlights how sustainable farming practices can ensure food availability, environmental conservation, and economic stability. By integrating agriculture, livestock, and resource recycling, it serves as an effective example of a sustainable food system for a greener and healthier future.

GAJAPATI DISTRICT



RUPALI SABAR, Class: VII
Guide Teacher: Rutuparna Bhuyan
Govt. UP School, Luhagudi, Gajapati

CREATING BIODEGRADABLE POLYTHENE

Introduction

Polythene is one of the most widely used single-use plastics and a major contributor to environmental pollution because it is non-biodegradable. It accumulates in soil and water bodies and can harm animals and ecosystems. To reduce this problem, biodegradable alternatives made from natural materials can be developed. This project focuses on creating a biodegradable polythene-like bioplastic using starch and other simple ingredients.

Objective

- To prepare a biodegradable alternative to conventional polythene.
- To demonstrate a simple method of producing bioplastic using natural materials.
- To promote environment-friendly materials that reduce plastic pollution.

Working Principle

The bioplastic is produced using starch, water, vinegar, and glycerin. Starch acts as the natural polymer that forms the base structure of the plastic. Vinegar helps break down the starch molecules, while glycerin acts as a plasticizer that makes the material flexible instead of brittle. When the mixture is heated and then dried, the starch molecules reorganize to form a thin, plastic-like biodegradable sheet.

Benefits

- Biodegradable and decomposes naturally in soil.
- Eco-friendly, made from plant-based materials.
- Safer for animals compared to conventional plastic.
- Requires simple materials and minimal equipment.
- Helps in reducing environmental pollution.

Conclusion

Biodegradable bioplastic made from starch provides a simple and sustainable alternative to traditional polythene. Although it may not be as strong as conventional plastics, its ability to decompose naturally and reduce environmental harm makes it a promising solution for future eco-friendly packaging materials.

GANJAM DISTRICT



PRADYUMNA KUMAR PANIGRAHY, Class: IX
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Brundaban High School, Hinjilicut, Ganjam

AGRI VISION FOR FUTURE FARMING

Introduction

Agri Vision for Future Farming is a smart farming model that integrates IoT, renewable energy, and organic practices to improve agricultural productivity. It promotes sustainable farming by conserving water, reducing labor, and protecting the environment.

Objective

The project aims to modernize farming through smart technologies, solar energy, drip irrigation, organic farming, and automated crop management for higher productivity and sustainable agriculture.

Working Principle

- **Smart Monitoring:** Sensors track soil moisture, temperature, and humidity in real-time to provide data-driven insights.
- **Renewable Energy:** High-efficiency Solar Panels power the entire farm, eliminating the cost and waste associated with traditional batteries.
- **Organic Fertigation:** The system promotes the use of Jeevamrut and Beejamrut for soil health, combined with NPK fertigation for precise nutrient delivery.
- **Automated Protection:** An Automatic Fire Extinguisher system prevents crop loss from fire hazards, while sensor-based deterrents protect against animal and bird threats.
- **Digital Tracking:** Each crop section is assigned a QR Code, allowing for easy digital tracking of growth cycles and health history.

Benefits

- **Economic:** Drastically reduces labor costs and energy bills through automation and solar power.
- **Environmental:** Promotes "Zero Budget" organic farming, reducing chemical runoff and preserving groundwater through rainwater harvesting.
- **Technical:** Introduces precision agriculture to the grassroots level, making farming more predictable and resilient.

Conclusion

Agri Vision for Future Farming shows that combining modern technology with organic farming can improve productivity, conserve resources and ensure food security.

GANJAM DISTRICT



RAJASMITA GOUDA, Class: VIII
Guide Teacher: Nikunja Naik
Project Upper Primery School, Benipalli, Ganjam

WATER SOAKING ROAD PROJECT

Introduction

Waterlogging on roads and declining groundwater levels are major challenges. This project introduces a Water Soaking Road system that allows rainwater to seep into the ground, reducing flooding and recharging groundwater while promoting efficient water conservation.

Objective

- To design a water soaking road model that allows rainwater to pass through the road surface.
- To reduce water logging and road accidents during heavy rain.
- To promote effective water management and groundwater recharge.
- To demonstrate a low-cost and eco-friendly solution for sustainable development.

Working Principle

The water soaking road works on the principle of permeable concrete, similar to "Topmix Permeable". The road is made using cement, water, and rock pieces in a proper ratio (1 : 2 : 3). Unlike normal concrete, this mixture contains gaps between rock pieces, allowing water to pass through the surface and seep into the ground. This helps in reducing water accumulation on roads and also helps recharge underground water sources.

Benefits

- Prevents water logging and road accidents.
- Helps in groundwater recharge.
- Reduces the need for costly drainage systems.
- Supports rainwater harvesting and water conservation.
- Eco-friendly and suitable for sustainable urban development.
- Can support heavy vehicles and is durable.

Conclusion

The Water Soaking Road and Water Management system provides a sustainable solution to prevent waterlogging, conserve water, and recharge groundwater. It supports the development of smart, eco-friendly, and water-secure cities.

GANJAM DISTRICT



SURAJ KUMAR SAHU, Class: IX
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E-WASTE MANAGEMENT

Introduction

E-waste, or electronic waste, refers to discarded electrical and electronic devices such as old bulbs, LED lights, wires, switches, and plastic components. With the rapid growth of technology, the amount of electronic waste is increasing every day. Improper disposal of e-waste can cause serious environmental problems, including soil, air, and water pollution. Therefore, proper e-waste management is essential to protect the environment and human health.

Objective

The project aims to promote the reuse and recycling of electronic waste, create awareness about responsible e-waste disposal, and encourage sustainable environmental practices.

Procedure

First, a small hole of about 5 cm is made in the plastic box. Then, the electric bulb is fixed securely inside the box. After that, the LED light is installed properly, and the wires are connected carefully to the switch and power source. A small PVC pipe piece is attached to provide support to the structure

Working of the Model

When the switch is turned on, electricity flows through the connected wires and lights up the bulb and LED. This shows how an electric circuit functions. The model demonstrates that electronic components that are considered waste can still be reused effectively if handled properly.

Conclusion

This project demonstrates that discarded electronic components can be reused effectively. Proper e-waste management helps reduce pollution, conserve resources, and build a cleaner, greener, and more sustainable future.

JAGATSINGHPUR DISTRICT



RAJASMITA PALEI, Class: VIII
Guide Teacher: Chandan Kumar Behera
Sompur Govt. High School, Sompur, Jagatsinghpur

MY HOME

Introduction

A sustainable food system can begin at home by adopting eco-friendly practices that conserve natural resources and reduce pollution. The "My Home" project demonstrates how a household can become self-sufficient by producing organic food, saving water, recycling waste, and using renewable energy. It promotes a healthy lifestyle while protecting the environment for future generations.

Objectives:

The main objectives of this project are to develop an eco-friendly home model, conserve and manage water effectively, produce fresh organic vegetables, recycle household waste, and reduce dependence on non-renewable energy sources through sustainable practices.

Working Principle:

This model includes rainwater harvesting to collect and store rooftop rainwater for irrigation and domestic use. Greywater from kitchens and bathrooms is recycled for gardening. Vertical farming is used to grow vegetables in limited space, supported by drip irrigation to minimize water wastage. Kitchen waste is converted into compost to prepare organic manure. A solar dryer is used to preserve food naturally, and solar lighting reduces electricity consumption, making the home energy-efficient and sustainable.

Benefits:

This system saves water and electricity, reduces waste, lowers expenses, ensures healthy organic food, and promotes environmental awareness.

Conclusion:

The "My Home" model shows that sustainable food systems can be successfully implemented at the household level to create a greener and healthier future.

SWAPNESWAR ROUT, Class: IX
Guide Teacher: Manisha Mishra
S. K. Academy, Jagatsinghpur

AUTO PILOTING TOILET: SMART WASTE & ENERGY SYSTEM

Introduction

The Auto Piloting Toilet is a smart sanitation system that uses automation to ensure hygiene while converting toilet paper waste into renewable energy. It combines sensors, automatic locking, and biomass technology to promote cleanliness and sustainable waste management.

Objective

The project aims to ensure proper toilet hygiene by making flushing mandatory before exit. It also demonstrates how used toilet paper can be utilized to generate thermal and electrical energy, reducing waste and promoting environmental sustainability.

Working Principle

When a user enters the toilet, the door closes automatically. After the manual lock is engaged, a Magnetic Reed Switch signals the microcontroller to activate an Electromagnet, securely locking the door. The system remains locked until the Flush Sensor detects that the toilet has been flushed. If the user attempts to leave without flushing, the door stays locked and a Buzzer sounds as an alert. Once the flush is detected, the microcontroller deactivates the electromagnet, unlocking the door for exit.

Waste-to-Energy System

Used toilet paper, rich in cellulose, is converted into energy through two methods: (1) direct combustion to produce steam that drives a mini turbine for electricity generation, and (2) anaerobic digestion with methanogen bacteria to produce methane gas for heating or power generation.

Conclusion

The system ensures hygiene, reduces disease risk, minimizes landfill waste, and generates renewable energy for powering toilet lighting and sensors. It demonstrates how smart automation and waste-to-energy technology can create cleaner, self-sustaining, and eco-friendly sanitation systems.

JAGATSingHPUR DISTRICT



SK JAMAMUDDIN, Class: X
Guide Teacher: Abhiram Jena
Kanakdurga Govt. High School, Piteipur, Jagatsinghpur

PEDAL OPERATED WASHING MACHINE

Introduction

This project introduces a handmade, sustainable solution for laundry, specifically designed for rural areas where electricity is scarce or unavailable. Developed following scientific principles, this low-cost device aims to provide a practical alternative to the laborious and stressful task of manual clothes washing.

Objective

The primary goal is to provide a quick, eco-friendly, and cost-effective washing method with zero operating costs. By utilizing muscular energy instead of electricity, the project aims to save energy while simultaneously promoting physical fitness and improving the health conditions of the users.

Working Principle

The machine operates on the basic scientific principle of centrifugation. Through a pedal-driven mechanism, human muscular energy is converted into rotational motion. This motion creates the centrifugal force necessary to effectively clean and rinse clothes, mimicking the action of an electric washing machine without the need for a power grid.

Benefits

- **Economic:** Can be built using household scraps for a fraction of the cost of commercial machines.
- **Eco-Friendly:** Operates with zero electricity and zero carbon emissions.
- **Health:** Provides a physical workout, helping users maintain a good physique and health during daily chores.

Conclusion

The pedal-operated washing machine is a perfect blueprint for sustainable living. It empowers rural communities by transforming a difficult task into an effortless, low-cost activity that benefits both the environment and personal well-being.

JAIPUR DISTRICT



PRINCE PRIYA SAMAL, Class: IX
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Panchayat High School, Rampur, Bari, Jaipur

ELIMINATE SINGLE-USE PLASTIC

Introduction

Single-use plastic is widely used in bags, bottles, packaging, and straws. Improper disposal leads to plastic waste accumulation in land, rivers, and oceans. Plastic does not decompose easily and breaks into microplastics, which pollute the environment. Therefore, proper plastic waste management is required to protect nature and human health.

Objectives:

1. To eliminate single-use plastic usage.
2. To promote proper plastic waste management
3. To reduce microplastic pollution.
4. To use technology, AI, and robots for plastic removal.

Working Principle / Process:

Plastic waste management includes segregation, collection, recycling, and reuse. Recycling plants process plastic into new products. Microplastics are harmful because they enter water, soil, food chains, and human bodies, causing health issues.

Technology such as AI-based waste sorting systems, smart dustbins, and robotic river cleaners can identify and separate plastic waste automatically. Drones and sensors can detect plastic pollution areas. Advanced filtration systems can remove microplastics from wastewater. These innovations help reduce plastic pollution for the future.

Benefits:

- Reduces environmental pollution
- Protects marine life and human health
- Promotes recycling and circular economy
- Encourages sustainable development

Conclusion:

Eliminating single-use plastic through proper management and modern technology is essential for a clean and healthy future. AI and robotics can play a major role in reducing plastic and microplastic pollution effectively.

JAJPUR DISTRICT



AYUSHMAAN ROUT, Class: VIII
Guide Teacher: Bikash Kumar Pati
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MISSION LIFE GOALS

Introduction

Rapid urbanization increases energy demand, traffic congestion, and carbon emissions. To achieve sustainable life goals, this project focuses on energy generation, efficiency, clean transportation, and carbon reduction. It integrates AI-based systems, renewable energy, and smart road technologies for an eco-friendly future.

Objectives:

1. To promote renewable energy and energy efficiency.
2. To reduce air pollution and fuel consumption.
3. To develop smart and eco-friendly transport systems.
4. To support green infrastructure and carbon reduction.

Working Principle

The AI-based traffic system uses real-time data to reduce congestion by 25-40%, lowering emissions. Hybrid renewable microgrids combine solar and wind energy with storage for reliable power.

Green Corridors are developed by planting trees along roads to absorb carbon and improve air quality.

Piezoelectric lanes generate electricity from vehicle pressure, and inductive charging lanes wirelessly charge electric vehicles while moving, promoting clean transportation.

Benefits:

- Reduces carbon emissions
- Generates clean energy
- Supports electric vehicles
- Improves air quality
- Promotes sustainable urban development

Conclusion:

By integrating AI, renewable energy, green corridors, and smart road technologies, we can build cleaner, energy-efficient, and sustainable cities for the future.

JAJPUR DISTRICT



SONALI PRADHAN, Class: IX
Guide Teacher: Bhagyalaxmi Sethy
Mahavinayak Bidyayana, Barachana, Jajpur

RE-TECH HUB: A SUSTAINABLE SOLUTION TO REDUCE E-WASTE

Introduction

Re-Tech Hub is a community-based initiative aimed at reducing electronic waste by establishing dedicated centres in every block and district. The project promotes repair, recycling, and reimagining of discarded electronics to build a circular economy.

Objectives:

- Reduce e-waste generation at the local level
- Promote repair over replacement
- Encourage recycling and reuse
- Create green employment opportunities
- Raise awareness about responsible disposal

Working Principle:

The Re-Tech Hub operates through five categories:

1. Rebuild - Restoring devices by replacing damaged parts.
2. Reverse Vending Machine - Collecting old electronics in exchange for rewards.
3. E-Waste Repairing Café - Community repair workshops guided by technicians.
4. Reimagine from Scrap - Creating innovative products from electronic scrap.
5. Plast cycle - Recycling plastic components into useful items.

Benefits:

- Reduces landfill waste and pollution
- Conserves natural resources
- Generates local employment
- Promotes environmental awareness
- Supports sustainable development goals

Conclusion:

Re-Tech Hub offers a practical, scalable, and eco-friendly solution to manage e-waste. By implementing such hubs across districts, we can significantly reduce environmental damage and promote a sustainable future.

JHARSUGUDA DISTRICT



PRIYANSU SAHU, Class: IX
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NAC Govt. High School, Lamtihabal, Jharsuguda

VEGETABLE WASTE TO ELECTRICITY

Introduction

Vegetable waste-to-electricity is a sustainable technology that converts discarded vegetable waste into renewable energy. It helps reduce organic waste, lowers pollution, and promotes clean energy production.

Objective:

To utilize vegetable waste for generating electricity while reducing waste disposal problems and producing organic fertilizer.

Working Principle

- **Collection & Pre-processing:** Organic waste is gathered from markets and households, sorted to remove non-organics, and shredded to increase the surface area for faster decomposition.
- **Anaerobic Digestion:** The waste enters a digester where bacteria break down the biomass in an oxygen-free environment. This produces Biogas, primarily composed of methane and carbon dioxide .
- **Conversion:** The captured biogas is purified and fed into a biogas generator. The combustion of this methane-rich gas produces electricity that can power buildings or be fed into the grid.
- **Alternative Methods:** For varied scales, technologies like gasification, pyrolysis, or fermentation can also be used to produce syngas or bio-ethanol.

Benefits:

- **Environmental:** Prevents organic waste from rotting in landfills, which significantly reduces methane emissions-a potent greenhouse gas.
- **Economic:** Reduces municipal waste management costs and cuts electricity bills.
- **Agricultural:** The leftover material from digestion, known as digestate, serves as a nutrient-rich organic fertilizer, returning vital minerals to the soil.

Conclusion:

It offers a practical, renewable energy solution for homes, farms, and communities, demonstrating how vegetable waste can be transformed into a valuable resource for sustainable development.

JHARSUGUDA DISTRICT



RAHUL BISWAL, Class: IX
Guide Teacher: Mahendra Padhan
GP High School, Bhagamunda, Jharsuguda

TESTING OF SOIL AND WATER BY HOME-MADE LITMUS PAPER

Introduction

Soil and water are important natural resources that support life on Earth. Their quality directly affects crop production, human health, and the environment. To know whether soil and water are acidic, basic, or neutral, we use an indicator like litmus paper. In this project, home-made litmus paper is prepared using red mandaar (hibiscus) flower petals. This method is simple, eco-friendly, and low-cost, making it useful for students and farmers.

Objectives:

1. To prepare home-made litmus paper using natural materials.
2. To test the pH nature of soil and water samples.
3. To identify whether samples are acidic, basic, or neutral.
4. To create awareness about soil and water quality testing.

Working Principle

Red Mandara flower petals contain natural pigments that act as indicators. When rubbed on white paper and dried, the paper works like litmus paper.

- If the paper turns red/pink, the sample is acidic.
- If it turns blue/greenish, the sample is basic.
- If there is no colour change, the sample is neutral.

This colour change happens due to the reaction of natural pigments with acids and bases.

Benefits:

- Low-cost and eco-friendly method
- Easy to prepare at home
- Helps farmers improve crop growth
- Ensures safe and hygienic water
- Increases scientific awareness among students

Conclusion:

This project shows that soil and water can be tested easily using home-made litmus paper.

KALAHANDI DISTRICT



ROSHAN NAIK, Class: X
Guide Teacher: Niranjana Muduli
Tipiguda Uccha Vidyapitha, Tipiguda, Kalahandi

AIR QUALITY INDEX CONTROLLER

Introduction

Air pollution from vehicle emissions, industrial activities, construction dust, and smoke has increased harmful particulate matter (PM10 and PM2.5) in the atmosphere, leading to serious health issues such as respiratory and cardiovascular diseases. This project focuses on improving air quality by adopting an innovative and sustainable air purification system for urban areas.

Objectives:

To reduce PM10 and PM2.5 levels, improve the Air Quality Index (AQI), and provide continuous air purification by installing air filters on street lights, creating a sustainable and eco-friendly solution for cleaner and healthier cities.

Working Principle

The air filter system is fixed on each street light and works 24×7. It sucks polluted air from three sides through a micro air filter and releases clean air using a DC fan. The system uses solar energy and a small wind turbine as power sources.

At night, an LDR sensor activates a mini water pump through a relay to spray water on the filters for cleaning collected dust and particulate matter. The dirty water flows into a drain through a pipe, and the cycle continues automatically.

Benefits:

- Reduces air pollution in urban areas
- Controls harmful particulate matter
- Improves public health
- Uses renewable energy (solar and wind)

Conclusion:

By installing this system on street lights, cities can improve air quality and create a healthier environment for future generations.

KALAHANDI DISTRICT



T.DHARMESH KAIBARTA, Class: VIII
Guide Teacher: Abhiseka Jena
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BEAT PLASTIC POLLUTION

Introduction

As the global population grows, the demand for convenience has led to the massive consumption of plastic. Despite being cheap and accessible, plastic is a non-biodegradable material that persists in the environment for centuries. Whether buried in soil or burned, it causes severe air, water, and soil pollution, eventually breaking down into toxic microplastics that pose fatal health risks like cancer.

Objectives:

The primary goal of this project is to advocate for a plastic-free environment by implementing the 5R framework. It aims to eliminate "Single-Use Plastic" from our daily lives to protect biodiversity, build a healthy society, and secure a beautiful future for the Earth.

Working Principle

The project operates on the 5Rs of waste management:

- **Refuse:** Saying no to unnecessary plastic items.
- **Reduce:** Cutting down on the volume of plastic consumed.
- **Reuse:** Using existing plastic containers multiple times.
- **Repurpose:** Converting discarded plastic into "beautiful things" or useful crafts (Upcycling).
- **Recycle:** Processing waste plastic into new raw materials.

Benefits:

- **Environmental:** Prevents the accumulation of waste in oceans and landfills, protecting marine and terrestrial life.
- **Health:** Reduces human exposure to harmful chemicals and microplastics.
- **Economic:** Demonstrates sustainability at a low cost.

Conclusion:

"Beat Plastic Pollution" proves that individual actions and creative repurposing can solve the plastic crisis. By adopting the 5R principle and rejecting single-use plastics, we can restore the health of our planet and create a pollution-free world.

KALAHANDI DISTRICT



SUBHALAGNA ROUL, Class: VII
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SMART PLASTIC RECYCLE: WASTE MANAGEMENT SYSTEM

Introduction

Plastic waste is a critical environmental challenge due to its non-biodegradable nature, persisting for centuries and polluting land, water, and air. This project introduces a "Smart Plastic Recycle" system designed to scientifically manage plastic waste, transitioning from hazardous dumping to resource recovery.

Objectives:

The project focuses on converting discarded plastics into high-value products and energy, thereby reducing the environmental footprint and supporting global sustainability goals.

Working Principle

The model operates on a multi-stage mechanical and chemical process:

- **Separation & Shredding:** Collected waste is washed with recycled water and separated in a floating tank based on the density principle (plastic floats while heavier debris sinks). A motor-based shredder then reduces it to small fragments.
- **Repurposing:** Shredded plastic is melted to create plastic roads and construction tiles.
- **Pyrolysis:** Some plastic is converted into liquid fuel through pyrolysis technology (heating in the absence of oxygen).
- **Power Source:** The entire facility is powered by Solar Energy, ensuring the recycling process itself is carbon-neutral.

Benefits:

- **Environmental:** Reduces landfill burden and protects marine and terrestrial life.
- **Resource Conservation:** Conserves water through a dedicated reuse system and saves energy via solar integration.

Conclusion:

This project demonstrates that managed correctly, plastic waste is a valuable resource. By combining recycling, energy recovery, and renewable power, this model provides a scalable, sustainable solution for modern waste challenges.

KANDHAMAL DISTRICT



SIBANI BEHERA, Class: VIII
Guide Teacher: Rasmit Kumar Apat
Govt. High School, Pirikudi, Kandhamal

ECO-FRIENDLY MEDICINAL PLANT

Introduction

Nature provides us with invaluable gifts, the most vital being medicinal plants. This project focuses on utilizing traditional, natural healing methods as a sustainable alternative to laboratory-made synthetic medicines, thereby reducing chemical dependency and environmental impact.

Objectives:

The primary objective is to promote the use of medicinal plants for treating common health issues like constipation and respiratory ailments. It aims to create a healthy, safe environment by increasing oxygen levels, reducing carbon dioxide, and providing natural, non-toxic alternatives to chemical pesticides.

Working Principle

The system operates on the principle of herbal conservation and organic cultivation. It integrates various plants such as:

- **Coriander:** Used for treating nasal bleeding, headaches, and coughs.
- **Poi (Malabar Spinach):** Utilized for its digestive benefits, particularly for relieving constipation in pregnant women. The model employs Drip Irrigation to keep the plants hydrated year-round and Green Netting to protect sensitive herbs from extreme heat and temperature fluctuations.

Benefits:

- **Health:** Provides immediate access to natural remedies for daily health issues.
- **Environmental:** Purifies the air, controls local temperatures, and conserves soil through organic practices.
- **Sustainability:** Reduces the carbon footprint associated with the pharmaceutical industry.

Conclusion:

Integrating medicinal plants into our daily lives ensures a balanced ecosystem. By combining traditional knowledge with modern conservation techniques like drip irrigation, this project paves the way for a greener, healthier, and more self-reliant society.

KANDHAMAL DISTRICT



SAI SUBHAM MOHANTY, Class: VIII
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SMART WASTE SEGREGATOR USING ARDUINO

Introduction

The Smart Waste Segregator is an automated system that uses sensors and embedded technology to separate dry, wet, and metallic waste at the source. It reduces manual effort, improves waste management, and supports efficient recycling.

Objectives:

To develop a low-cost, intelligent waste segregation system that automatically identifies and separates different types of waste, improving hygiene and reducing human contact with hazardous materials.

Working Principle

The system is governed by an Arduino microcontroller and follows a logical detection sequence:

- **Detection:** An IR Sensor detects when an object is placed in the entry container.
- **Identification:** A Metal Proximity Sensor checks for metallic content, while a Raindrop Sensor identifies moisture levels for wet waste. If neither is triggered, the waste is classified as dry.
- **Sorting:** Based on the sensor logic, an L293D Motor Driver activates a DC Gear Motor to rotate the base and align the correct bin. A second motor then opens a flap to drop the waste.
- **Feedback:** A Buzzer provides audio signals throughout the sorting cycle.

Benefits

- **Efficiency:** Automates a tedious task, saving significant time and labour.
- **Sustainability:** Increases the success rate of recycling programs by preventing cross-contamination between wet and dry waste.

Conclusion:

The Smart Waste Segregator offers a practical and scalable solution for effective waste management. By combining automation and sensor technology, it promotes cleaner surroundings, efficient recycling, and sustainable urban development.

KANDHAMAL DISTRICT



BASUDEV PRADHAN, Class: X
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Sanskrit Vidyapitha, Phulbani, Kandhamal

PREPARATION OF TOYS AND DECORATIVE ITEMS FROM WASTE MATERIALS

Introduction

Increasing waste generation due to urbanization has created serious environmental challenges. This project applies the 3R (Reduce, Reuse, Recycle) principle by converting discarded plastic and electronic waste into creative toys and decorative items, promoting sustainable waste management.

Objectives:

To demonstrate the reuse of waste materials by creating useful and attractive products while promoting environmental awareness, scientific creativity, and basic concepts of electronics and physics through low-cost recycled materials.

Working Principle

The project utilizes two distinct scientific principles:

- **Air Pressure & Liquid Flow:** The Spray Machine Toy uses a recycled plastic bottle and spray mechanism. When the trigger is pulled, it creates high air pressure that forces water through a narrow nozzle, converting it into a fine mist.
- **Electrical Conductivity:** The LED Decoration repurposes E-waste. By connecting discarded LED terminals to a battery and switch, it demonstrates the flow of current through a closed circuit to produce light.

Benefits

- **Waste Reduction:** Diverts plastic and E-waste from landfills.
- **Economic:** Provides a zero-cost method for creating educational toys and home décor.
- **Educational:** Enhances electronics knowledge and understanding of fluid dynamics in an engaging, creative way.

Conclusion:

This project proves that creativity is a powerful tool for environmental protection. By converting discarded items into innovative toys and lights, we not only minimize our ecological footprint but also prove that sustainable living can be both practical and enjoyable.

KENDRAPARA DISTRICT



ASIA KHATUN, Class: VIII
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WASTE TO ELECTRICITY

Introduction

This project presents an innovative solution for sustainable waste management by converting waste materials into usable energy. It addresses the dual challenge of waste disposal and environmental pollution by integrating energy generation with a sophisticated multi-stage smoke filtration system.

Objectives:

The primary objectives are to transform heat energy from burning waste into electricity, design a filtration system to minimize harmful emissions, and implement an indicator circuit to monitor system activity in real-time.

Working Principle

The system operates on the Thermoelectric Effect (Peltier module), which captures heat from burning waste and converts it directly into electricity. Simultaneously, a vacuum suction chamber pulls the resulting smoke through a triple-layer filtration process:

- **Membrane Pre-filter:** Removes large dust particles.
- **HEPA Filter:** Traps fine smoke particles.
- **Zeolite Filter:** Absorbs harmful gases and odors. An LED indicator glows to confirm electricity generation, while purified air is released into the environment.

Benefits:

- **Eco-Friendly:** Significantly reduces air pollution and harmful smoke emissions.
- **Resourceful:** Provides small-scale electricity for rural or off-grid areas.
- **Practical:** Simple, cost-effective design suitable for educational and sustainable energy demonstrations.

Conclusion:

The "Save Energy" project successfully demonstrates a circular economy model where waste is a resource. By combining power generation with advanced filtration, it offers a practical blueprint for eco-friendly energy solutions that protect public health and the environment.

KENDRAPARA DISTRICT



SMRUTIREKHA SAHOO, Class: IX
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SMART GREEN CITY: A BLUEPRINT FOR SUSTAINABLE URBAN LIVING

Introduction

As urbanization accelerates, the demand for energy and resources often leads to environmental degradation. The SMART GREEN CITY model is a visionary urban ecosystem designed to achieve carbon neutrality and resource independence.

Objectives:

The primary goal is to design a self-sustaining city infrastructure that minimizes its carbon footprint. The project focuses on four key pillars: eliminating air pollutants through filtration, reducing transport emissions with electric mobility, conserving water through harvesting, and optimizing waste collection via IoT-enabled smart systems.

Working Principle

The city operates through five core technological pillars:

- **Carbon Charcoal Filtration:** Large-scale activated carbon filters adsorb VOCs and pollutants, actively scrubbing the urban air.
- **Renewable Energy:** A combination of Vertical Wind Turbines (VAWT) and Solar Panels on rooftops and bus shelters provides clean, decentralized power.
- **EV Ecosystem:** All transport consists of Electric Vehicles supported by solar-powered charging stations, eliminating tailpipe emissions.
- **Rainwater Harvesting (RWH):** Rooftop runoff is collected and stored in underground tanks to recharge the water table and provide secondary water sources.
- **Smart Dustbins:** IoT-enabled ultrasonic sensors monitor waste levels in real-time to optimize collection routes and prevent overflow.

Benefits & Conclusion:

This model ensures Climate Mitigation by reducing CO₂ levels and enhances Water Security through harvesting. The Green Energy City proves that smart automation and renewable technology can transform urban challenges into a sustainable, future-ready roadmap for global development.

KENDRAPARA DISTRICT



DIBYA RANJAN PANDA, Class: VIII
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CAUSES OF ENVIRONMENT POLLUTION AND ITS VARIOUS SOLUTIONS

Introduction

Climate change and rising global temperatures have become a grave concern for the world. Human activities have led to the pollution of air, water, and soil, creating a crisis that threatens the survival of all living beings. This project explores sustainable practices to reverse this environmental degradation.

Objectives:

The primary goal is to raise public awareness about the severity of climate change and the role of greenhouse gases in global warming. It aims to demonstrate how adopting renewable energy and organic practices can significantly reduce pollution levels and protect biodiversity.

Working Principle

Working Principle

- **Solar & Wind Energy:** Utilizing abundant sunlight and wind to generate clean electricity.
- **Hydroelectric Power:** Harnessing the kinetic energy of flowing water from hills and mountains.
- **Eco-Transport:** Promoting electric bikes and cars to eliminate fuel-based emissions.
- **Organic Agriculture:** Replacing chemical fertilizers with organic farming to preserve soil fertility and prevent water contamination.

Benefits:

Implementing these solutions leads to a drastic reduction in carbon footprints and atmospheric pollutants. It ensures a sustainable supply of energy, healthier soil for food production, and a cleaner atmosphere, ultimately slowing down the rate of global warming.

Conclusion

By prioritizing renewable resources and large-scale reforestation, we can maintain the environmental balance. This project serves as a roadmap to solve global warming, ensuring a green, beautiful, and safe world for future generations.

KEONJHAR DISTRICT



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SUSTAINABLE ENERGY PRODUCTION THROUGH SMART TECHNOLOGY

Introduction

In response to the growing global demand for clean power, this project introduces a hybrid renewable energy system. It focuses on harvesting energy from natural sources-wind and sun-while utilizing smart technology to ensure efficient distribution and storage.

Objectives

The primary goal is to minimize reliance on fossil fuels by creating a self-sustaining power grid. It aims to demonstrate how combined renewable sources can provide a stable electricity supply for households and small communities, reducing both carbon emissions and energy costs.

Working Principle

The system integrates two main energy harvesters:

- **Wind Power:** A vertical or horizontal axis turbine converts the kinetic energy of wind into mechanical energy, which a generator then turns into electricity.
- **Solar Power:** Photovoltaic (PV) panels capture sunlight to produce direct current (DC). A Smart Controller manages these inputs, using a battery bank for storage and an inverter to convert power for domestic use.

Benefits:

- **Reliability:** The hybrid nature ensures power generation even when it is cloudy (wind) or calm (solar).
- **Sustainability:** Provides 100% clean energy with zero operational emissions.
- **Cost-Efficiency:** Significantly reduces monthly electricity bills and requires minimal long-term maintenance.

Conclusion

Sustainable energy production through smart technology is the future of urban and rural electrification. By combining diverse renewable sources with intelligent monitoring, we can achieve true energy independence and protect the environment for future generations.

KEONJHAR DISTRICT



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REMOVAL OF HEAVY METALS USING BIO-SORBENTS

Introduction

This project presents a low-cost, eco-friendly water filtration system that uses natural bio-sorbents inside a bamboo structure to remove heavy metals and impurities from tap water. It offers a sustainable solution for providing safe drinking water, especially in rural areas.

Objectives

To develop an affordable filtration system using agricultural waste and natural bio-sorbents to reduce heavy metals and Total Dissolved Solids (TDS), improving the quality of drinking water.

Working Principle

The system operates using a Gravity-Fed Bamboo Column packed with specialized bio-sorbents:

- **The Filtration Column:** A hollowed bamboo pole serves as the natural casing, providing a chemical-free path for water flow.
- As water flows through the bamboo, orange peel removes heavy metals, coconut coir filters impurities, gooseberry (amla) bark traps metallic contaminants, and algae absorbs dissolved heavy metals through biosorption. The quality of the filtered water is evaluated by measuring the Total Dissolved Solids (TDS) before and after filtration.
- **Monitoring:** The effectiveness is measured by calculating TDS (Total Dissolved Solids) before and after the filtration process to ensure the water meets safety standards.

Benefits & Conclusion

The system reuses agricultural waste, reduces water contaminants, and provides an economical, environmentally friendly method of water purification. It demonstrates that natural materials can effectively improve water quality, promoting safe drinking water and sustainable living.

KEONJHAR DISTRICT



PRANGYARANI SAHOO, Class: IX
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WHY MILLETS IN MID-DAY MEAL

Introduction

Millets are nutritious cereal crops such as ragi, bajra, jowar, and foxtail millet, known for their high content of protein, fiber, vitamins, and minerals. Including millets in school Mid-Day Meals provides a healthy alternative to polished rice and refined wheat, helping improve children's nutrition, growth, and overall well-being.

Objectives

1. To promote healthy and balanced nutrition among school children.
2. To create awareness about the nutritional importance of millets.
3. To reduce malnutrition, anemia, and micronutrient deficiencies among students.
4. To encourage the consumption of traditional and locally available grains.
5. To support sustainable agriculture and environmentally friendly farming practices.
6. To improve students' concentration, learning ability, and overall well-being.

Benefits of Including Millets in Mid-Day Meals

1. Improves growth, immunity, and overall health.
2. Enhances concentration and learning ability.
3. Provides sustained energy throughout the day.
4. Requires less water and supports sustainable farming.
5. Benefits local farmers by increasing millet cultivation.

Conclusion

Millets are a healthy, affordable, and eco-friendly food choice. Their inclusion in Mid-Day Meals can improve children's nutrition, support farmers, and contribute to a healthier and more sustainable future.

KHORDHA DISTRICT



ABHINAB PARIDA, Class: IX
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INTEGRATED PLASTIC WASTE MANAGEMENT SYSTEM

Introduction

Plastic waste, particularly LDPE bags and packaging, poses a severe environmental threat due to its non-biodegradable nature. This project addresses the dual challenge of waste accumulation and rising energy demands by presenting an integrated "Waste-to-Energy" solution.

Objectives

The primary goal is to achieve zero-waste plastic management. Specific objectives include recycling LDPE into durable plasto-tiles, harvesting energy from human footsteps via these tiles, and utilizing pyrolysis to produce hydrogen for clean electricity generation through fuel cells.

Working Principle

The system operates through two innovative technological paths:

- **Plasto-Tiles & Footstep Power:** LDPE plastic is melted and mixed with sand to create water-resistant tiles. These are mounted on a mechanical assembly with springs and N20 DC gear motors. When stepped upon, mechanical pressure is converted into electricity.
- **Pyrolysis & Hydrogen Fuel Cell:** Remaining waste is heated in the absence of oxygen (Pyrolysis), breaking down into hydrogen-rich gas. This gas is fed into a Hydrogen Fuel Cell, where it reacts to produce electricity, with water as the only byproduct.

Benefits

- **Comprehensive Recycling:** Ensures complete utilization of various plastic types.
- **Infrastructure:** Provides eco-friendly, durable materials for pavements and smart cities.

Conclusion

This project proves that plastic waste is a valuable resource rather than an environmental burden. By integrating mechanical energy harvesting with advanced pyrolysis, the model offers a sustainable, scalable blueprint for environmental protection and green energy production in urban infrastructure.

KHORDHA DISTRICT



ABHINASH BALIYARSINGH, Class: VIII
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E-WASTE MANAGEMENT IN DAY-TO-DAY LIFE

Introduction

As technology advances, electronic waste (E-waste)-discarded devices like phones, computers, and batteries-has become the fastest-growing waste stream. Improper disposal releases toxic chemicals like lead and mercury, posing severe threats to human health and the global ecosystem.

Objectives

The primary objective of this project is to implement a systematic "Reduce, Reuse, and Recycle" framework for electronics. It aims to prevent hazardous materials from entering landfills, recover valuable metals, and educate the public on responsible disposal habits to ensure a sustainable digital future.

Working Principle

The system operates through a structured lifecycle management process:

- **Collection & Sorting:** Categorizing E-waste into recyclable and non-recyclable components.
- **Component Recovery:** Manually or mechanically dismantling devices to extract reusable parts and precious metals (gold, copper, silver).
- **Safe Disposal:** Neutralizing hazardous substances through specialized chemical treatments to prevent soil and water contamination.

Benefits

- **Environmental:** Prevents toxic leaching and reduces the need for destructive mining of raw materials.
- **Resource Efficiency:** Conserves energy by repurposing existing components rather than manufacturing new ones from scratch.
- **Health:** Minimizes the risk of respiratory and neurological diseases caused by exposure to heavy metals.

Conclusion

Effective E-waste management is no longer optional; it is a necessity for day-to-day life. By treating old gadgets as urban mines rather than trash, we can protect our environment while fueling technological innovation through sustainable resource recovery.

KHORDHA DISTRICT



SIDDHI SREYANS SRICHANDAN, Class: VI
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MULTI-OUTPUT BIO-ENERGY FROM FOOD WASTE

Introduction

In the face of growing environmental challenges, effective waste management is critical. This project, focuses on the systematic processing of food waste. By shifting from simple disposal to the 3R (Reduce, Reuse, Recycle) framework, it treats food waste as a valuable raw material for multi-output energy production.

Objectives

The primary objective is to minimize environmental and health hazards by diverting food waste from landfills. The project aims to demonstrate a circular energy model that extracts multiple resources-solid manure, biogas, and liquid-based electricity-using sustainable and economical methods.

Working Principle

The system operates through a solar-powered mechanical process. Solar Energy drives a DC motor and grinder to process food waste into solid and liquid forms.

- **Solid Waste:** Undergoes decomposition to produce Manure for agriculture and Biogas for cooking.
- **Liquid Waste:** Processed through an electrochemical setup using copper and zinc plates to generate Electricity. It can also be refined to produce Ethanol and medicinal components.

Benefits

- **Environmental Protection:** Reduces methane emissions and soil pollution.
- **Sustainability:** Provides a decentralized source of cooking gas and electricity.
- **Agriculture:** Produces high-quality organic manure, promoting soil health.

Conclusion

This project proves that "waste" is merely a resource in the wrong place. By integrating solar technology with bio-chemical processes, we can achieve a sustainable lifestyle that protects health, supports the economy, and preserves the environment for future generations.

KORAPUT DISTRICT



ANISHA NAIK, Class: IX
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SMART SOLAR-POWERED WIRELESS EV CHARGING AND PIEZOELECTRIC CAR PARKING ALERT SYSTEM

Introduction

With the growing adoption of electric vehicles (EVs), there is a need for sustainable charging and smart parking solutions. This project integrates solar-powered wireless EV charging with a piezoelectric parking alert system to promote clean energy, efficient parking management, and enhanced road safety.

Objectives

To develop an eco-friendly system that wirelessly charges EVs using solar energy and detects vehicle movement through piezoelectric sensors, providing parking alerts while reducing dependence on conventional electricity.

Working Principle

Solar panels capture sunlight and convert it into electrical energy, which is stored in a rechargeable battery. The stored power is supplied to a wireless charging transmitter coil embedded in the parking area. When an EV with a compatible receiver coil is parked over it, electricity is transferred wirelessly through electromagnetic induction to charge the vehicle. Piezoelectric sensors installed beneath the parking surface detect the pressure of vehicles entering or leaving the parking space. The generated signal activates an alert system or display, indicating parking occupancy and improving traffic management.

Benefits

The system uses renewable solar energy, reduces carbon emissions, enables convenient cable-free EV charging, improves parking management, conserves electricity, and enhances road safety through real-time parking alerts.

Conclusion

This project combines renewable energy, wireless power transfer, and smart sensing technology to create an efficient, sustainable, and user-friendly EV charging and parking system.

KORAPUT DISTRICT



ASHIK KHILO, Class: VIII
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CONSERVATION OF WATER IN RURAL AREAS

Introduction

Water scarcity is a growing threat to rural development and climate stability. In many villages, vast amounts of rainwater and household wastewater are lost due to poor management

Objectives

The primary goal is to achieve zero water wastage across the village. By implementing systematic collection and smart automation, the project aims to recharge local water bodies, eliminate stagnant water-which breeds mosquitoes- and generate economic value through improved resource management

Working Principle

The system combines mechanical filtration with smart technology:

- **Collection:** Rainwater from rooftops and greywater from kitchens and bathrooms are channeled through a dedicated pipe network.
- **Filtration:** Water passes through a wire mesh (primary filter) and a traditional sand-and-stone filtration bed to remove debris and impurities before entering the village pond.
- **Smart Automation:** Sensor-based taps ensure water flows only when needed, while ultrasonic sensors in overhead tanks automatically shut off motors to prevent overflow.

Benefits

- **Health:** Eliminates stagnant street water, reducing the risk of Dengue and Malaria.
- **Economic:** Efficient pond maintenance and resource saving can generate a village profit of 7-8 lakh rupees annually.

Conclusion

This project proves that smart, small-scale interventions can solve large-scale environmental problems. By treating every drop as a resource, the "Water Conservation in My Village" model provides a sustainable blueprint for rural prosperity and environmental preservation.

KORAPUT DISTRICT



ROSHNI BEHERA, Class: IX
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EARTHEN AIR COOLER

Introduction

Rising temperatures and increasing use of air conditioners have led to higher electricity consumption and environmental concerns. This project introduces an Earthen Air Cooler that uses natural cooling principles to provide efficient cooling with low energy consumption and minimal environmental impact.

Aim of the Project

To develop an eco-friendly cooling system using natural materials that reduces electricity consumption while demonstrating sustainable and energy-efficient cooling technology.

Basic Concept

The working principle of this air cooler is based on three scientific concepts:

A) Venturi Effect

The Venturi effect explains that when air flows through a narrow passage, its velocity increases and pressure decreases. In the terracotta cooler, hot air passes through narrow sections, increasing air speed and improving contact with the wet terracotta surface, which enhances cooling.

B) Evaporative Cooling

When water on the terracotta surface evaporates, it absorbs heat from the surrounding air. This process reduces the temperature of the air and produces a natural cooling effect.

C) Capillary Force

Capillary action draws water from the reservoir into the porous terracotta structure. This keeps the surface continuously moist, allowing constant evaporation and cooling without complex pumping systems.

Conclusion

The Terracotta Air Cooler is an eco-friendly and energy-efficient cooling solution. It uses natural principles like evaporative cooling and capillary action to reduce temperature while consuming very little electricity. This makes it a sustainable alternative to conventional cooling systems.

MAYURBHANJ DISTRICT



NABJEET SASMAL, Class: IX
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HEALTH NEST: ECO-FRIENDLY SMART HOSTEL

Introduction

The Eco-Friendly Smart Hostel is a sustainable housing model that combines traditional building materials like bamboo and cow dung bricks with smart technology. It provides a low-cost, energy-efficient, and eco-friendly living environment while reducing pollution and conserving natural resources.

Objectives

To develop a safe, sustainable, and energy-efficient hostel using natural materials, renewable energy, and smart technologies that reduce construction costs, minimize environmental impact, and enhance the safety and comfort of residents.

Working Principle

- **Renewable Energy:** Solar panels generate electricity, while an anaerobic digester converts organic waste into biogas for cooking and power.
- **Smart Automation:** LDR sensors automatically control lighting, and rain sensors manage rainwater harvesting.
- **Natural Insulation:** Mud and dung walls keep indoor temperatures cool, reducing the need for air conditioning.
- **Mechanical Safety:** Spring-loaded anti-suicide fan hooks release under excessive load to enhance safety.
- **Bio-Repellents:** A carbolic acid barrier around the house helps repel snakes and other reptiles.

Benefits

- **Sustainability:** Reduces carbon emissions and dependence on conventional electricity.
- **Economic:** Uses low-cost local materials with minimal utility expenses.
- **Safety & Health:** Provides a safer living environment with natural cooling and protective features.
- **Resource Conservation:** Promotes efficient water use through integrated rainwater harvesting.

Conclusion

It offers a practical, low-cost, and environmentally friendly housing solution that promotes energy efficiency, safety, and resource conservation, making it an ideal model for future sustainable communities.

MAYURBHANJ DISTRICT



DIPIKA DAS, Class: IX
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WASTE REDUCED

Introduction

As global energy demands rise and waste management becomes a critical challenge, this project explores the potential of "Waste-to-Energy" (WTE). It addresses the dual problem of environmental pollution from overflowing landfills and the depletion of non-renewable energy sources by converting discarded materials into a functional power source.

Objectives

The primary goal is to demonstrate a sustainable method for generating electricity using everyday waste. It aims to reduce the volume of waste sent to landfills, minimize greenhouse gas emissions, and provide a low-cost, decentralized energy solution for small-scale applications or rural electrification.

Working Principle

The system utilizes a Thermoelectric Power Generation model. Waste materials are subjected to controlled combustion to produce heat. This thermal energy is captured by a Peltier module (Thermoelectric Generator), which creates a voltage difference between its hot and cold sides, converting heat directly into electricity. The generated power is then regulated by a circuit and stored in a battery or used to power low-voltage devices like LEDs.

Benefits

- **Environmental:** Diverts waste from landfills and reduces methane emissions.
- **Economical:** Lowers energy costs by using free, abundant fuel sources.
- **Resourceful:** Promotes a circular economy where "trash" is viewed as a valuable energy asset.

Conclusion

Generating electricity from waste materials is a practical and scalable solution for modern energy challenges. By integrating waste management with power production, this project provides a blueprint for a cleaner, more energy-independent society.

MAYURBHANJ DISTRICT



KARISMA MOHANTA, Class: X
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ECO-FRIENDLY GREY WATER TREATMENT SYSTEM FOR SUSTAINABLE LIVING

Introduction

As water scarcity becomes a global crisis, recycling "grey water"-waste from bathrooms, kitchens, and laundry (70-80% of household waste)-is essential. This project presents a sustainable, scalable model to treat and reuse this water for non-potable purposes.

Objectives

The primary goal is to create an eco-friendly, cost-effective system to remove solid particles, odors, and harmful pathogens. It aims to significantly reduce BOD (Biochemical Oxygen Demand) and COD (Chemical Oxygen Demand) levels, making the water safe for gardening, flushing, and cooling.

Working Principle

The system operates through two main models:

- **Domestic:** Uses a screening chamber to remove solids, a DC motor-driven aeration unit to reduce odor, and UV disinfection to kill bacteria. Finally, multi-stage filters (sand, gravel, charcoal) purify the water.
- **Commercial:** Incorporates a Biodigester tank (anaerobic process) and a Constructed Wetland (Reed Bed) for natural nutrient removal, followed by chlorination or UV treatment.

Benefits

- **Environmental:** Reduces freshwater demand and pollution in water bodies.
- **Economic:** Low maintenance costs and potential for biogas production in commercial setups.
- **Practical:** Reused water can be used for "humidification" to naturally control indoor temperatures.

Conclusion

This modular system is a viable solution for homes, schools, and industries. By integrating IoT for monitoring and sustainable biological filtering, it transforms waste into a valuable resource for a greener future.

NABARANGPUR DISTRICT



NARESH PUJARI, Class: X
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REDUCE WASTE, REPRODUCE THE BEST

Introduction

As India advances toward economic prosperity, increased consumption has led to a critical surge in waste generation. This project, sponsored by the Eco Club under the Government of Odisha, addresses the environmental threat posed by the haphazard disposal of biodegradable and non-biodegradable materials, such as plastics and electronics, in our public spaces and water bodies.

Objectives

The primary goal is to shift the public mindset from "disposal" to "resource recovery." The project aims to reduce landfill contributions, upcycle discarded items like plastic bottles and containers into functional products, and demonstrate that creativity can transform waste into wealth.

Working Principle

The system follows the "Circular Economy" principle. Waste is first classified into biodegradable and non-biodegradable categories. Using upcycling techniques and creative engineering, non-biodegradable items (like tires and plastic products) are repurposed into decorative models or utility tools, while biodegradable materials are managed to decompose safely, ensuring a "zero-waste" lifecycle.

Benefits

- **Environmental:** Significantly reduces pollution in rivers, beaches, and roadsides.
- **Educational:** Serves as a visual tool to teach students and the community about sustainable lifestyles.
- **Economic:** Lowers waste management costs by turning trash into usable household items.

Conclusion

"Reduce Waste, Reproduce the Best" proves that waste is only a burden if ignored. By viewing discarded materials as a resource, we can protect our climate and build a cleaner, more sustainable developed India.

NABARANGPUR DISTRICT



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SMART AGRICULTURE FARMING

Introduction

Smart Agriculture Farming is a sustainable farming model that uses solar energy and automated technologies to improve agricultural productivity. It helps farmers reduce costs, conserve natural resources, and increase crop yields through efficient and eco-friendly practices.

Objectives

This project aims to modernize rural agriculture by integrating renewable solar energy with automated sensor technology to create a sustainable, low-cost farming model. By combining rainwater harvesting and soil moisture detection, the system optimizes water usage while reducing manual labor and human error. Additionally, it enhances security through automated crop protection and extends the shelf life of produce with solar-powered refrigeration.

Working Principle

The project automates the farming lifecycle by integrating rainwater harvesting and sensor-based irrigation to ensure precise water management and soil health. Security is enhanced through automated scarecrows and smart fencing that deter threats, while greenhouse technology provides a controlled climate for sensitive crops. Finally, solar-powered cold storage offers an eco-friendly way to preserve harvests, ensuring crop longevity and reducing waste even in remote areas.

Benefits

The system conserves water and energy, reduces farming costs, minimizes crop losses, increases productivity, and provides reliable farming solutions for rural areas with limited electricity.

Conclusion

Smart Agriculture Farming combines renewable energy with automation to create an efficient, eco-friendly, and sustainable farming system. It supports higher crop yields, conserves resources, and improves the livelihood of farmers while promoting sustainable agricultural development.

NABARANGPUR DISTRICT



SURAJ MANDAL, Class: IX
Guide Teacher: Badri Naryan Biswal
Govt. UG High School, Majhidhanua, Nabarangpur

WATER RECYCLING PROCESS FOR A SUSTAINABLE FUTURE

Objectives

The main objective of this project is to reuse used water in different ways to increase groundwater level and reduce water wastage. The project aims to promote water conservation and sustainable use of available water resources.

Working Principle

In daily life, a large amount of water is used for activities such as drinking, hand washing, cleaning classrooms, flushing toilets, gardening, and laboratory work. Much of this water, such as handwashing water, tap water, and leftover drinking water, can be collected and reused for non-drinking purposes.

The system works by:

- Collecting reusable wastewater from daily school activities.
- Filtering or redirecting the water where possible.
- Reusing it for purposes like gardening, cleaning, or flushing toilets instead of wasting it

Benefits

- Reduces water wastage in schools.
- Helps lower water bills.
- Decreases pressure on local water supply.
- Supports groundwater conservation.
- Promotes environmental protection and sustainable living.
- Creates awareness among students about water conservation.

Conclusion

Water is one of the most important natural resources for human life, but increasing water scarcity has made conservation essential. Reusing water in schools is a simple and effective way to save fresh water, reduce waste, and protect the environment. This project encourages sustainable practices and helps build responsible habits among students and society.

NAYAGARH DISTRICT



SIDHARTHA SANKAR SAHOO, Class: X
Guide Teacher: Deepak Maharana
K.C V.P, Ganja, Nayagarh

GRAVITY BATTERY

Introduction

The Gravity Battery is an innovative energy storage system that stores excess electricity as gravitational potential energy by lifting a heavy weight. It offers a clean, long-lasting, and eco-friendly alternative to conventional chemical batteries for renewable energy storage.

Objectives

The main objective of the Gravity Battery project is to develop a clean and sustainable energy storage system that can store excess electricity produced from renewable sources. It aims to reduce dependence on lithium-ion batteries, minimize environmental impact, and provide a reliable method to balance electricity supply and demand.

Working Principle

The system works on the principle of gravitational potential energy ($PE = mgh$). When excess electricity is available, a motor lifts a heavy weight using a pulley system, storing energy as gravitational potential energy. When electricity is needed, the weight is allowed to descend gradually, rotating a generator that converts the stored energy back into electrical energy.

Benefits

The Gravity Battery is environmentally friendly, requires minimal maintenance, has a long operational life, and contains no harmful chemicals. It efficiently stores renewable energy, balances electricity supply and demand, and provides a cost-effective and sustainable energy storage solution.

Conclusion

The Gravity Battery is a simple, reliable, and eco-friendly technology for storing renewable energy. By replacing chemical batteries with gravitational energy storage, it supports clean energy utilization and contributes to a more sustainable and energy-secure future.

NAYAGARH DISTRICT



SUBHAM MAHAPATRA, Class: X
Guide Teacher: Sradhanjali Pradhan
Govt. High School, Bahadajhola, Nayagarh

WASTE VEGETABLE AND FRUITS TO GENERATE ELECTRICITY

Introduction

This project demonstrates an eco-friendly method of generating electricity from waste fruits and vegetables. The natural acids present in fruit and vegetable juice are used to produce electrical energy through electrochemical reactions, while also reducing organic waste and promoting environmental sustainability.

Objectives

To generate electricity from fruit and vegetable waste using a simple, low-cost electrochemical process while promoting renewable energy and sustainable waste management.

Working Principle

The project works on the principle of a simple electrochemical cell. Fruit or vegetable juice acts as an electrolyte due to its acidic nature. When a copper wire (positive electrode) and a zinc nail (negative electrode) are inserted into the juice, a chemical reaction takes place between the electrodes and the electrolyte. This reaction produces a small electric potential that can be measured using a multimeter and can power a small LED. The remaining solid waste from the juice can also be used to produce compost or biogas.

Benefits

The project reduces organic waste, generates clean energy, uses inexpensive and readily available materials, and serves as an effective educational model for renewable energy and electrochemical principles.

Conclusion

This project shows that waste fruits and vegetables can be converted into useful electrical energy through a simple, sustainable process. It promotes renewable energy, waste recycling, and environmental conservation while demonstrating the practical use of organic waste.

NUAPADA DISTRICT



KHILESWAR KHARSEL, Class: IX
Guide Teacher: Soumyashree Baghel
National Govt. High School, Nuapada

SMART INTEGRATED SAFETY AUTOMATION SYSTEMS

Introduction

Modern challenges in agriculture and public safety require innovative, technology-driven solutions. This report covers four key innovations: the Automatic Fertilizer Spray Machine, the Anti-Sleeping Alarm for Drivers, the Smart Safety Helmet, and the Automatic Fire Fighting Robot. These projects utilize embedded systems, sensors, and microcontrollers to minimize human risk, reduce labor, and improve efficiency in hazardous or demanding environments.

Objectives

To improve safety, efficiency, and automation in agriculture, transportation, and emergency systems

Working Principle

The systems operate on the following technical frameworks:

- **Detection:** Sensors (Flame, IR, Alcohol, Tilt, Soil Moisture, and Eye-blink sensors) continuously monitor environmental or biological inputs.
- **Processing:** A microcontroller receives signals from these sensors and processes them according to preset conditions.
- **Action:** The system triggers an output mechanism-such as activating a water pump to extinguish fire, spraying fertilizer through nozzles, sounding a buzzer to wake a driver, or disabling a vehicle's ignition if a helmet is missing or alcohol is detected.

Benefits

Enhances safety, reduces wastage, saves time and cost, and minimizes human risk.

Conclusion

These automated systems demonstrate the powerful role of robotics and embedded technology in solving real-world problems. By shifting from manual intervention to smart automation, we can significantly enhance productivity in agriculture and safety in transportation and emergency services. These projects represent a scalable and reliable future for modern engineering.

NUAPADA DISTRICT



BINAYAK PANIGRAHI, Class: X
Guide Teacher: Ajit Kumar Meher
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SMART DESIGN FOR WATER AND ENERGY CONSERVATION

Introduction

This project focuses on conserving water and energy using simple, eco-friendly methods such as an automatic irrigation system, water recharge pit, solar bottle bulb, and earthen pot cooling system. It aims to provide sustainable solutions for daily needs, especially in areas with limited resources.

Objectives

Objectives of this project are to save water and energy, automate irrigation based on soil moisture, recharge groundwater through rainwater harvesting, provide low-cost lighting, and reduce indoor temperature using natural methods.

Working Principle

The system works by using a soil moisture sensor and Arduino to automatically control irrigation when the soil becomes dry. Rainwater is collected and filtered through a recharge pit to increase groundwater levels. The solar bottle bulb uses sunlight to provide indoor lighting during the day, while earthen pots cool the building through the evaporation process.

Benefits

- **Saves Water:** The automatic irrigation system supplies water only when the soil moisture is low, preventing overwatering and reducing water wastage.
- **Conserves Energy:** The solar bottle bulb provides free daylight illumination, reducing dependence on electric lights and lowering electricity consumption.
- **Recharges Groundwater:** The rainwater recharge pit allows rainwater to seep into the ground, helping to replenish groundwater levels and improve water availability.
- **Reduces Indoor Temperature:** The earthen pot cooling system uses natural evaporation to cool buildings, minimizing the need for fans or air conditioners and saving energy.
- **Low-Cost and Affordable:** The project uses inexpensive, locally available materials, making it economical for households, schools, and communities.

Conclusion

Overall, this project offers a simple, effective, and sustainable solution for conserving water and energy. It improves living conditions and promotes environmentally friendly practices, making it valuable for both rural and urban areas.

NUAPADA DISTRICT



BHARATI PATEL, Class: X
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Panchayat High School, Godal, Nuapada

GENERATING ELECTRICITY FROM WASTE MATERIALS

Introduction

Increasing urban waste has become a major environmental and public health concern. This project presents a waste-to-energy system that converts discarded materials into electricity while reducing air pollution through efficient carbon capture and filtration.

Objectives

To develop a sustainable waste management system that generates electricity from waste, minimizes air pollution through carbon trapping, and converts waste byproducts into useful materials, promoting a cleaner and circular economy.

Working Principle

The system operates on the principle of Thermal-to-Electrical conversion and Adsorption:

- **Energy Generation:** Waste is burned to produce heat and light. Solar panels are positioned to capture this light energy (acting as thermal/light sensors) to generate electricity, which is then stored in batteries.
- **Emission Control:** Smoke is channeled through a chimney equipped with a Carbon Filter. Through the process of adsorption, carbon particles stick to the filter's surface, allowing purified air to escape.
- **Resource Recovery:** Collected carbon filtrate is repurposed to manufacture ink or paint. Non-combustible waste is segregated for use in road construction.

Benefits

- **Environmental Health:** Reduces urban waste and controls air pollution through carbon capture.
- **Energy Reliability:** Generates electricity by utilizing the heat and light produced from waste combustion, even at night.

Conclusion

This project demonstrates an eco-friendly approach to waste management by converting waste into useful energy while reducing pollution. It promotes clean energy generation, resource recovery, and sustainable environmental protection.

PURI DISTRICT



SAI ADITYA PRADHAN, Class: VII
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HUMIDITY LESS AIR COOLER

Introduction

Traditional air coolers work on the principle of water evaporation, which increases humidity in the room and makes the air uncomfortable and sticky. The Humidity Less Air Cooler is designed to provide cool air without increasing moisture in the environment. It uses aluminium pipes with circulating cool water and a fan to cool the air, making the room comfortable and dry.

Objective

The main objective of this project is to design a cooling system that provides cool air without increasing humidity. It also aims to reduce the disadvantages of traditional desert coolers, create a low-cost and energy-efficient alternative to air conditioners, and promote eco-friendly and water-saving cooling techniques.

Working Principle

The humidity-less air cooler works by drawing warm air from the room and passing it through cool aluminium pipes. Water circulates continuously through these pipes using a small water pump, which keeps the pipes cold. As warm air passes over the cold pipes, heat from the air is absorbed, making the air cooler. The tower fan then blows this cool and dry air into the room. Since the cooling happens through cold pipes instead of evaporation, the humidity level in the room does not increase.

Benefits

This project provides cool air without increasing humidity, making the environment more comfortable. It is low-cost, energy-efficient, and uses less water compared to traditional coolers. The system is easy to build, maintain, and repair. It is also eco-friendly and can be used in homes, classrooms, shops, and small workplaces as a sustainable cooling solution.

Conclusion

The Humidity Less Air Cooler is an innovative and practical cooling system that solves the problem of high humidity caused by traditional coolers. By using cooled aluminium pipes and air circulation, it provides comfortable and dry cooling while saving energy and water. This project demonstrates an eco-friendly and affordable alternative for cooling in both rural and urban areas.

PURI DISTRICT

STATE LEVEL SCIENCE EXHIBITION (ECO CLUB) 2025-26

NAME : SAI ARPITA PRADHAN
CLASS : IX
SCHOOL : ODISHA ADARSHA VIDYALAYA, SATYABADI
NAME OF GUIDE TEACHER : BISWARANJAN PRATAPSINGH KHAMARI
NAME OF PROJECT : SUSTAINABLE AGRICULTURE
BY SMART SOIL MOISTURE MONITORING AND WATER CONTROL

Introduction:
The project "Smart Soil Moisture Monitoring and Water Control" demonstrates an automated irrigation system that uses a soil moisture sensor to measure the water content in soil. Based on the moisture level, the system automatically turns the water supply on or off to maintain the right amount of moisture for plants. This project shows how technology can be used to save water, reduce manual effort, and improve plant growth through smart farming methods.

Aim:
To develop a smart irrigation system that monitors soil moisture and automatically controls water supply to ensure proper plant growth while conserving water.

Materials Required:
Dynamometer, Battery Fan, Solar Panel, Plastic Container, Sunboard, plastic Straw, Bluetooth Module to send SMS, Arduino Uno, Moisture Sensor, Relay, Trees, Houses

Working Principle:
The system works by using a soil moisture sensor to measure the water content in the soil. The sensor sends signals to a microcontroller, which then controls the water pump. If the soil is dry, the controller turns on the water pump, and if the soil is wet, it turns the pump off automatically.

Utility and Benefits:
Used for automatic irrigation in farms
Helps monitor soil condition without rain
Useful in areas where water supply is limited
Supports smart and modern farming techniques
Saves water by preventing overwatering
Reduces human effort and time in irrigation
Promotes healthy plant growth
Increases crop yield and reduces water wastage

helps conserve water and highlights the importance of smart farming technology based on sensors and automation. This project is a great example of sustainable agriculture.

SUSTAINABLE AGRICULTURE

CONTROL ROOM

SOLAR POWERED

Smart Soil Moisture Monitoring & Water Control

SAI ARPITA PRADHAN, Class: IX
Guide Teacher: Biswaranjan Pratap Singh Khamari
Odisha Adarsha Vidyalaya, Satyabdi, Puri

SMART SOIL MOISTURE MONITORING AND WATER CONTROL

Introduction

The Smart Soil Moisture Monitoring and Water Control system is an automatic irrigation project that measures soil moisture and controls water supply. A soil moisture sensor checks the moisture level and sends data to a microcontroller, which turns the water pump ON or OFF when needed.

Objective

The objective of this project is to develop a smart irrigation system that automatically waters plants based on soil moisture. It helps save water, reduce manual work, and maintain proper moisture for better plant growth.

Working Principle

A soil moisture sensor is placed in the soil to continuously monitor the moisture level. The sensor sends signals to a microcontroller such as Arduino, which processes the data and compares it with a preset moisture level. If the soil becomes dry, the microcontroller activates a relay module that turns ON the water pump and supplies water to the plants. When the soil reaches the required moisture level, the sensor sends updated data to the microcontroller, which automatically turns OFF the pump. The system may also use renewable energy sources like solar panels and wind turbines to power the irrigation system, making it eco-friendly and sustainable.

Advantages

This system saves water, reduces human effort, and ensures proper watering of plants. It also improves plant growth and can be used with renewable energy sources like solar power.

Applications

It can be used in agricultural fields, gardens, greenhouses, parks, and nurseries for efficient and automated irrigation.

Conclusion

The system provides an efficient and eco-friendly way to manage irrigation. It uses automation and sensors to supply the right amount of water, supporting smart and sustainable agriculture.

RAYAGADA DISTRICT



K. KALYAN DURGA, Class: IX
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SMART ENERGY GENERATING ROAD SYSTEM

Introduction

Rapid urbanization has increased energy consumption, especially for street lighting. Conventional street lights waste electricity by operating continuously. This project proposes a smart energy-generating road system that uses traffic movement and smart sensors to produce and save energy.

Objective

The main objective is to reduce dependence on conventional power sources, use renewable energy from road traffic, and automatically control street lights to save electricity.

Working Principle

IR sensors detect vehicle or pedestrian movement and turn the street lights ON only when needed. Wind turbines installed near roads rotate due to wind created by moving vehicles and generate electricity. Speed breakers convert vehicle pressure into mechanical energy to produce electricity. Piezoelectric sensors placed under the road convert mechanical stress from vehicles into electrical energy.

Advantages

This system saves electricity, reduces carbon emissions, uses renewable energy, and requires minimal human control. It also supports smart city development and has low operating cost.

Benefits

The smart energy-generating road system reduces electricity consumption by operating street lights only when vehicles or pedestrians are detected, leading to significant energy savings. It generates clean, renewable electricity from traffic movement using wind turbines, speed breakers, and piezoelectric sensors, thereby reducing dependence on conventional power sources and lowering carbon emissions. The system supports smart city development by providing an automated, cost-effective, and environmentally sustainable solution for road infrastructure and public lighting.

Conclusion

This project shows an innovative way to generate and save energy using traffic movement and smart sensors. It helps reduce energy wastage and supports sustainable and eco-friendly urban infrastructure.

RAYAGADA DISTRICT



SWARNARUPA MAHAPATRA, Class: IX
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Govt. Girls High School, Rayagada

AI SMART FARMING USING SOIL MOISTURE SENSOR & BLUETOOTH

Introduction

Smart Farming is an automated agricultural system that uses soil moisture sensors and smart technology to improve irrigation and crop management. It helps farmers conserve water, reduce labour, and increase productivity by automatically supplying water and fertilizer based on soil conditions.

Aim of the Project

To develop an AI-based automatic irrigation system that monitors soil moisture, supplies water and fertilizer when required, and sends real-time notifications to the farmer's mobile phone via HC-05 Bluetooth, ensuring efficient and sustainable farming.

Working Principle

The soil moisture sensor detects the moisture level present in the soil. The Arduino reads this sensor data and decides the action based on the moisture level. If the moisture is below 30%, the irrigation system starts. If the moisture level is between 30% and 70%, the soil condition is normal. If it is above 70%, the irrigation system stops. The relay module switches ON the water and fertilizer pumps when required. At the same time, the HC-05 Bluetooth module sends notifications to the farmer's mobile phone.

Components Used

The main components used in this project are Arduino UNO or Nano, a soil moisture sensor, an HC-05 Bluetooth module, a mini water pump, a mini fertilizer pump, a relay module, a 5V or 12V power supply, connecting pipes, water and fertilizer tanks, and connecting wires with a base structure.

Applications

The project can be used in farms, home gardens, greenhouses, nurseries, and science exhibitions to demonstrate modern smart agriculture technology.

Conclusion

The AI Smart Farming System automatically manages irrigation and fertilizer supply based on soil moisture levels. The Bluetooth notification feature keeps farmers informed in real time. This project helps improve farming efficiency while conserving water and other resources.

RAYAGADA DISTRICT



PRITAM PRADHAN, Class: IX
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ARTIFICIAL GREEN ENERGY WIND TREE

Introduction

The increasing demand for clean and renewable energy has created the need for innovative and sustainable power generation systems. Conventional energy sources are limited and contribute to environmental pollution, while existing renewable technologies may not perform efficiently in all locations. The Artificial Green Energy Wind Tree is an innovative system that mimics a natural tree by using small wind turbine blades to convert wind energy into electricity. It provides an eco-friendly, cost-effective, and efficient solution for generating clean energy, especially in desert and coastal regions with abundant wind resources.

Objective

The aim of this project is to generate electricity using an artificial wind tree that converts wind energy into electrical energy.

Procedure

In desert or coastal areas, wind energy can be used to generate electricity. This can be installed in these locations. The structure is made using strong iron rods so that it can withstand high-speed winds. The tree looks similar to a real tree, but instead of leaves it has small turbine-shaped wings. These wings rotate when wind blows and their axis is connected to small DC generators (2V-12V). The electricity produced by the generators is then connected to a transformer and an inverter. The transformer converts DC to AC power and sends it to electric lines, while the inverter can store some electricity in batteries. Depending on wind speed and the number of wings, the electricity produced can range from about 2 kWh to 20 kWh.

Why Choose Artificial Wind Tree Over Wind Mills and Solar Panels?

This project is mainly useful in deserts or coastal sandy areas where natural vegetation cannot grow. In deserts, wind often carries sand particles that can cover solar panels and reduce their efficiency. Windmills are also more expensive compared to artificial wind trees. Therefore, wind trees can be a more efficient and economical option in such areas.

Conclusion and Future Applications

The artificial wind tree is an efficient method for generating electricity in areas where solar panels and traditional windmills cannot be easily used. By installing many wind trees together, a large amount of electricity can be generated. Future research can further improve this technology and help support sustainable and eco-friendly energy solutions.

SAMBALPUR DISTRICT



ANKITA SAHU, Class: X
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Lady Lewis Girls High School, Sambalpur

ECO EARN - SMART DUSTBIN

Introduction

Rapid urbanization and population growth have led to a significant increase in the generation of solid waste, making effective waste management one of the major environmental challenges of the modern world. Improper disposal of waste not only pollutes the environment but also causes health hazards, unpleasant surroundings, and the spread of diseases. Public places such as schools, parks, markets, railway stations, and bus terminals often suffer from littering due to a lack of awareness and motivation among people.

To address this challenge, the Eco Earn - Smart Dustbin has been developed as an innovative, technology-driven solution that combines automation, the Internet of Things (IoT), and a reward-based system to encourage responsible waste disposal. Unlike conventional dustbins, this smart dustbin automatically opens its lid when waste is detected, making it convenient and hygienic to use. More importantly, it rewards users with "Green Points" for every successful waste disposal, creating a positive incentive that motivates individuals to adopt environmentally friendly habits.

Objective

The objective of this project is to promote proper waste disposal and environmental awareness using smart technology. It encourages users to throw waste responsibly by rewarding them with "Green Points," helping to reduce littering and improve cleanliness in public places.

Working Principle

The system uses an ESP32 microcontroller, ultrasonic sensor, servo motor, LCD display, and IoT connectivity. When a user places waste near the dustbin, the ultrasonic sensor detects it and automatically opens the lid. After disposal, the LCD shows "You earned 1 Green Point," and the points are updated in the Blynk App. The system also detects when the dustbin is full and sends an alert.

Benefits

This project promotes hygiene, reduces pollution, and motivates eco-friendly behaviour. It supports smart city development and can be installed in schools, parks, railway stations, and other public areas.

Conclusion

The Eco Earn Smart Dustbin combines technology with social responsibility to create a cleaner, smarter, and greener environment.

SAMBALPUR DISTRICT



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WASTE TO WEALTH (PLASTIC RECYCLING & INNOVATION)

Introduction

Plastic waste, comprising discarded bags, bottles, and wrappers, presents a catastrophic environmental threat due to its non-biodegradable nature. It clogs drainage systems, enters the food chain as microplastics, and endangers marine life. This project provides a sustainable intervention by reimagining plastic waste not as trash, but as a versatile raw material for industrial and energy applications.

Objectives

The primary goal is to convert discarded polymers into valuable resources including electricity, ink, construction bricks, and bitumen substitutes. By doing so, the project aims to reduce landfill pressure, lower construction costs, and capture carbon emissions that would otherwise contribute to atmospheric pollution.

Working Principle

- **Plastic to Road/Bricks:** Shredded plastic is melted and mixed with bitumen or sand/cement to create durable, waterproof construction materials.
- **Plastic to Ink:** Through pyrolysis (heating in a closed environment), carbon black residue is captured and processed into writing ink.
- **Plastic to Electricity:** The thermal energy generated during the melting process is harnessed to drive turbines.

Benefits

- **Durability:** Plastic-infused roads and bricks are more water-resistant and earthquake-sturdy.
- **Pollution Control:** Captures carbon residue and prevents plastic from breaking down into toxic microplastics.

Conclusion

"Waste to Wealth" demonstrates that small-scale innovations can trigger a significant environmental revolution. By managing plastic through technical repurposing, we can protect public health and build a circular economy that secures a cleaner, greener future.

SONEPUR DISTRICT



REYANSH THANAPATI, Class: IX
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UTILISATION OF E-WASTE TO SAVE ENERGY

Introduction

Electricity is a valuable resource, and conserving it helps protect natural resources and the environment. Proper utilization and recycling of electronic waste (e-waste) not only reduce pollution but also recover valuable materials, saving energy and minimizing the need for new resource extraction.

Objectives

To create awareness about energy conservation through the proper reuse and recycling of e-waste, promote energy-efficient practices, and encourage responsible disposal of electronic devices.

Methodology

Information on electricity-saving practices and e-waste management was collected from books, websites, and awareness campaigns. Common household energy-wasting habits and recyclable electronic items were identified and studied.

Working Model

A model was prepared to demonstrate the collection, segregation, and recycling of e-waste. Usable electronic components such as LEDs, motors, wires, switches, and batteries were recovered from discarded devices and reused to create simple working circuits and educational models, showing how e-waste can be converted into useful products while reducing energy consumption.

Ways to Save Electricity

Electricity can be saved by using energy-efficient products such as LED bulbs and switching off electrical appliances when they are not in use. Turning off lights and fans when leaving a room also helps reduce energy waste. Using energy-efficient refrigerators, air coolers, and air conditioners can further lower electricity consumption. Solar panels are a good alternative source of clean energy. Saving fuel and conserving water also help reduce the need for electricity generation.

Results

The study showed that recycling and reusing e-waste conserve energy, reduce environmental pollution, and recover valuable materials. Adopting energy-efficient habits along with proper e-waste management helps protect natural resources and supports sustainable development.

SONEPUR DISTRICT



NIBEDITA SAHU, Class: IX
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WASTE MANAGEMENT

Introduction

Waste generation is increasing rapidly due to population growth, urbanization, and modern lifestyles. Large amounts of waste from homes, schools, and industries are produced every day, which causes land, air, and water pollution. Proper waste management helps protect the environment and conserve natural resources.

Objectives

The main objective of this project is to understand different types of waste produced in daily life and study their harmful effects. It also aims to explore ways to reduce waste using the 5R principle and encourage eco-friendly habits at home and in school.

Methodology

Waste produced at home or school was observed and recorded for one week. The waste was separated into biodegradable and non-biodegradable categories. Discussions with family members and classmates were conducted to understand waste disposal habits. Information about composting and recycling methods was also collected from books and environmental resources.

Working Model

A small composting model was prepared using a container, soil, and kitchen waste to show how biodegradable waste can turn into natural manure. A waste segregation model with labeled bins for wet, dry, and hazardous waste was also prepared. Various useful items were made from waste materials, such as compost from vegetable waste, Dhanpura from straw, a box from banana fiber, corn peel crafts, sabai grass items, teaching learning materials from palm leaves, decorative items from waste bangles and sauce bottles, pots from plastic bottles, envelopes from invitation cards, and multi-section bags from recycled materials.

Results

The study showed that most household waste is biodegradable and can be converted into compost. Plastic waste is the major non-biodegradable problem. Proper waste segregation at the source makes recycling easier, and small daily habits can significantly reduce the amount of waste produced.

SONEPUR DISTRICT



SMITARANI MISHRA, Class: VIII
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USEFULNESS OF INDUSTRIAL WASTE

Introduction

Industries are important for the development of a nation, but they also create pollution. This project focuses on reducing pollution by converting hazardous industrial waste into useful products.

Aim of the Project

The aim of this project is to convert hazardous industrial waste into useful products and reduce environmental pollution.

Description of the Project

Industries produce three types of waste: gaseous, liquid, and solid waste. Gaseous waste like carbon dioxide (CO_2) is absorbed using a rotating cotton conveyor belt and reacted with water to produce carbonic acid, which is useful for industries. Liquid waste is filtered and treated through electrolysis to produce hydrogen and oxygen gases, which have many industrial and medical uses. The remaining purified water can be reused for gardening. Solid waste collected from the system is mixed with sand and plastic to produce eco-friendly bricks that are stronger and more durable than ordinary bricks.

Usefulness of the Project

This project produces useful materials such as carbonic acid, hydrogen gas, oxygen gas, and durable bricks, which can be used in industries, construction, and other fields.

Future Prospects of the Project

Industrial waste can be reused to recover valuable materials, produce energy, and create eco-friendly construction materials. Proper waste management will reduce pollution, lower costs, create jobs, and support sustainable development.

Conclusion

Industrial waste is a major environmental problem, but with proper methods it can be converted into useful products. This approach helps reduce pollution and supports economic and environmental sustainability.

SUNDARGARH DISTRICT



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SPACE-BASED SOLAR ENERGY (SBSP)

Introduction

Space-Based Solar Power (SBSP) is an advanced renewable energy concept in which solar energy is collected in space using satellites and transmitted wirelessly to Earth. Unlike ground-based solar panels, SBSP can generate electricity continuously (24/7) without interruption from clouds, night, or seasonal changes. Major space agencies like NASA, ISRO, and JAXA are researching this technology. This project presents a simplified model to explain the working principle of SBSP in an educational way.

Aim of the Project

- To explain how solar energy can be collected in space.
- To demonstrate wireless power transmission using microwaves.
- To show how SBSP can provide clean energy and emergency power supply.

Working Principle

In Space-Based Solar Power systems, large solar panels placed on satellites collect sunlight in space. Photovoltaic cells convert this sunlight into electrical energy. The electricity is then converted into microwave energy and transmitted wirelessly toward Earth. A receiving antenna called a rectenna collects the microwave energy and converts it back into electrical power, which can be used for homes, industries, and power grids.

Applications

- Emergency power supply
- Rural electrification
- Reduction of fossil fuel dependence
- Future global clean energy systems

Conclusion

Space-Based Solar Power is a futuristic and sustainable energy solution that can help solve global energy and pollution problems. Although currently expensive, ongoing research by space agencies may make SBSP practical and affordable in the future.

SUNDARGARH DISTRICT



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WASTE TREATMENT TECHNIQUES

Introduction

Waste Treatment Techniques provide a sustainable solution for managing increasing urban waste by converting solid waste into useful energy. The system reduces landfill pollution while ensuring environmentally safe treatment through efficient waste processing and emission control.

Objectives

To develop a waste-to-energy system that reduces landfill waste, generates electricity, controls air pollution, and promotes the reuse of waste byproducts for sustainable development.

Working Principle

The system operates through a sequential industrial and chemical treatment process:

- **Collection & Transport:** Waste is systematically gathered from dumping yards and transported to a centralized Waste Treatment Plant.
- **Thermal Conversion:** The waste is subjected to controlled combustion (burning). The heat generated from this process is utilized to produce steam, which drives turbines to generate electricity.
- **Air Purification:** To prevent environmental damage, the "intoxicated" or toxic air produced during burning is passed through a filtration and purification system before being released into the atmosphere.
- **Carbon Transformation:** The residual matter remaining after the heating process is converted into carbon particles, which can be further utilized in industrial applications or as a soil additive.

Benefits

The system generates renewable energy from waste, reduces landfill volume, minimizes air pollution through emission control, and converts waste residues into valuable products, supporting a circular economy.

Conclusion

Waste Treatment Techniques offer an effective and eco-friendly approach to waste management by combining energy generation with pollution control.

SUNDARGARH DISTRICT



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BIO-ENZYME FROM KITCHEN WASTE

Introduction

Kitchen waste such as fruit and vegetable peels forms a large part of household garbage. When this waste is thrown away, it causes bad smell, pests, and landfill pollution. Instead of wasting it, kitchen waste can be used to produce bio-enzyme, a natural and eco-friendly cleaning liquid that is useful for the environment.

Objectives

The objective of this project is to convert kitchen waste into bio-enzyme through fermentation, reduce organic waste, provide a natural cleaning solution, and promote sustainable and zero-waste practices.

Procedure for Making Bio-Enzyme

Clean the container and add jaggery, fruit peels, and water in the correct ratio. Close the lid and mix well, leaving some space for gas formation. Keep the bottle in a cool and dark place. Open the lid daily during the first 30 days to release gas, then open every 3-7 days. Allow fermentation for about 90 days. After three months, filter the liquid using a strainer. The golden-brown liquid obtained is bio-enzyme, and the leftover solids can be used as compost.

Observations

In the first week, gas bubbles form inside the bottle. In the second week, peels float and a mild citrus smell appears. After about four weeks, the colour becomes yellowish-brown. By the final weeks, gas formation reduces and a clear brown liquid with a pleasant smell is obtained.

Benefits

The bio-enzyme produced from kitchen waste is a natural, non-toxic, and eco-friendly cleaner that reduces the use of harmful chemical cleaning products. It helps minimize household organic waste by converting it into a valuable resource, thereby reducing landfill pollution and greenhouse gas emissions. The project promotes sustainable waste management, saves money on cleaning products, and encourages eco-friendly and zero-waste living practices.

Conclusion

The project "Bio-Enzyme from Kitchen Waste" shows that household waste can be converted into a useful and eco-friendly product. It promotes sustainable living and demonstrates that waste can become a valuable resource for protecting the environment.





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