ANNUAL PROGRESS REPORT

FY-2021-2022

ENVIS RESOURCE PARTNER ON
ENVIRONMENTAL BIOTECHNOLOGY
UNIVERSITY OF KALYANI, NADIA, WEST BENGAL
Email: desku@envis.nic.in
Website: http://www.deskuenvis.nic.in

Government of India
Ministry of Environment, Forest & Climate Change

(EI Division)

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Annual Progress of ENVIS Resource Partner from April, 2021- March, 2022

1.	**Name of Host Organization:**	S.N. Bose Innovation Centre (Present address) Dept. of Environmental Science (Previous address) University of Kalyani, Kalyani, Nadia West Bengal-741235
2.	**Assigned Subject Area:**	ENVIRONMENTAL BIOTECHNOLOGY
3.	**Date/Month/Year of establishment of ENVIS Centre:**	June, 2002
4.	**Name and designation of ENVIS Coordinators:**	**From 5th October, 2020- 24th March 2022** Prof. Asoke Prasun Chattopadhyay ENVIS Coordinator E-mail Id: desku-env@nic.in & asoke@klyuniv.ac.in Mobile number: 08240510068 **From 25th March 2022 -till date** Prof. Kausik Mondal Department of Zoology University of Kalyani E-mail Id: desku-env@nic.in & kausik.mondal@klyuniv.ac.in Mobile number: 9434510521 **From 5th October, 2020- till date** Dr. Subhankar Kumar Sarkar ENVIS Deputy Coordinator E-mail Id: rishi.subho@gmail.com
5.	**Has the Host Organization constituted an Advisory Committee for guiding the activities of the Centre?**	Yes
	Composition of the Advisory Committee: (Select YES or NO: if YES kindly fill the right column space; if NO kindly leave it blank) **YES** For smooth running of ENVIS RP and conducting of the GSDP course two committee formed with academic experts, industry personals, Government representatives etc.,	**Expert Advisory body for smooth running of ENVIS RP, University of Kalyani** 1. Prof. Samir Kumar Mukherjee (Dept. of Microbiology, University of Kalyani) 2. Dr. Tapas Kumar Bandyopadhaya (Dept. of Molecular Biology & Biotechnology, University of Kalyani) 3. Prof. Soma Mukherjee (Dept. of Environmental Science, University of Kalyani) 4. Prof. Jayanta Kumar Biswas (Department of Environmental Management, University of Kalyani) (Details in our website: http://deskuenvis.nic.in/aboutus.asp)

		For smooth conducting of the GSDP course 1. Hon'ble Vice Chancellor, University of Kalyani, Head of the Centre 2. Prof. Ashis Kumar Panigrahi, Ex-Coordinator of the ENVIS Centre, Former Professor, Dept of Zoology, University of Kalyani. 3. Prof. S. C. Santra, Ex. Coordinator ENVIS centre, Former Professor, Dept of Environmental Science, University of Kalyani. 4. Prof. Samir Kumar Mukherjee, Dept. of Microbiology, University of Kalyani, Nadia 5. Prof. Tapas Kumar Bandyopadhaya, Dept. of Molecular Biology & Biotechnology, K.U 6. Prof. Soma Mukherjee, Dept. of Environmental Science, University of Kalyani, Nadia 7. Prof. Jayanta Kumar Biswas, Department of Environmental Management, University of Kalyani 8. Mr. Naba Kumar Mandal, Kalyani Municipalty 9. Mr. Raghib Hushen, KRISH Biotech 10. Representative from Prandhara Water treatment plant 11. Dr. Joydev Jana, PHED, Kalyani

6. Current ENVIS Staff Structure:

Sl. No.	Name	Position held	Qualification and Experience	Joining Date in ENVIS Centre	Joining Date in current position	2020-21		
						Leaving Date (if applicable)	Emoluments drawn (Rs.)	
							Monthly	Annual
1	Prof. Kausik Mondal	ENVIS Coordinator and Professor in the Dept. of Zoology, K.U	Ph. D. in Zoology • Teaching experience: 20 years. • Research experience: 20 years. **Research Area**: Aquaculture and fisheries science, Biodiversity, Ecotoxicology, Microbiology, Nanotechnology • Head of the Department, Department off	25.03.2022	25.03.2022	N.A	Nill	Nill

				Zoology, University of Kalyani • **Former and Present Coordinator in ENVIS** Resource Partner on 'Environmental Biotechnology' University of Kalyani. • Former DFO, Govt. of West Bengal, India. • Editor of two international Research Journals. • Chairman and Member of different Academic and Research bodies of different Universities.					
	2	Dr. Subhankar Kumar Sarkar	ENVIS Deputy Coordinator and Associate professor in the Dept. of Zoology, K.U	Ph. D. in Zoology • Teaching experience as Associate/Assistant Professor: 17years. • Research experience: 20 years. • Enlisted as scarab beetle taxonomist from India in the University of Nebraska - Lincoln State Museum, Division of Entomology, USA (In scarab workers world directory prepared by Prof. Brett C. Ratcliffe).	05.10.2020	05.10.2020	N.A	Nill	Nill

	3	Dr. Anusaya Mallick	Programme Officer	M.Sc, Ph. D. and Diploma in computer science More than 10 years working as **Programme Officer in ENVIS** Resource Partner on 'Environmental Biotechnology' University of Kalyani. Previously more than ten years research experience (**DST WOS-B Scientist**, funded by **DST, Govt. of India** and **Research Fellow,** Funded **DBT, Govt. of India** in **CIFA**, ICAR, Bhubaneswar) and **two years** teaching experience as contractual **lectures in Degree** colleges.	26-12-2011	26-12-2011	NA	46,690.15	5,60,281.8
	4	Mr. Sourav Banerjee	Information officer	B.Com, Diploma in Software Application, Web Designing More than 16years working in ENVIS RP in University of Kalyani Previously, 05 years working experience as Data Entry Operator in ENVIS Centre of CME, ISM, Dhanbad	01.09.2005	01.09.2005	NA	38,996.97	4, 67,963.64
	5	Mr. Tanmay Acharjee	IT Officer	B. Tech in IT and MBA in IT Nearly four years working in ENVIS	03.07.2018	03.07.2018	NA	31,539. 38	3,78, 472.56

				RP in University of Kalyani. Previously 8years teaching experience in High School and 7 months experience as OSD in Vice- Chancellor of Kalyani University, W.B					
	6	Mr. Subham Dutta	Data Entry Operator	Higher Secondary. Nearly four years working in ENVIS RP in University of Kalyani. One year experience as computer expert and lab assistance.	03.07.2018	03.07.2018	NA	14,641.00	1,75,692.00

7.	Mandate of the Host Organization	Mandate of the ENVIS Centre
	The host organiastion, University of Kalyani is a state aided university with '**A' grade** Accredited by the National Assessment and Accreditation Council (NAAC). The host institute provides infrastructure and academic support to the ENVIS RP.	**Short term Objectives** • Systematic collection, compilation and dissemination of data on "Environmental Biotechnology" for providing information services. • Publication of Newsletters and Abstract volumes on the subject for wide dissemination of information. • Development and updating of a website in the field for accessing information through internet. • Organize training, workshop & seminar on thematic subjects. **Long term Objectives** • Upgradation of our existing website in the field of Environmental Biotechnology for the greater interest of researchers, academician, students, commercial entrepreneurs of specific areas and policy makers. • Development and documentation of environmental biotechnology data bank. • Establishment of liaison with various concerned institutes and departments of India and abroad, which are working in the field of Environmental Biotechnology. • Development of descriptive/numerical databases and maintaining environmental information

		database for district/state/country. • District-wise Environmental grid mapping. • Green skill development Programme (GSDP) courses and its application towards job creation and betterment of the Environment.

8. Activities Undertaken by ENVIS (RP) for the FY-2021-2022

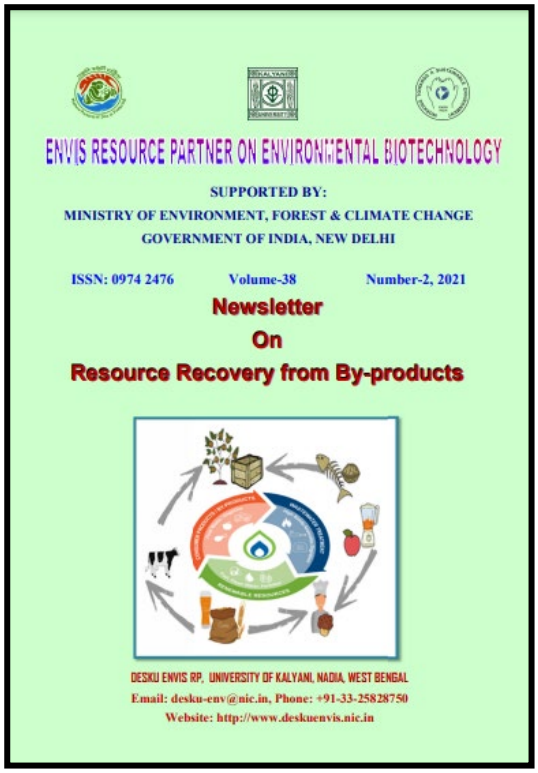
8.1 Newsletters for FY- 2021-2022

Sl. No	Title	Publisher	Year	Type of publication	Content/coverage of topics	Relevance and URL
1	Newsletter on 'Environmental Sustainability and Ecological Footprint ' (Vol. No. 38, Issue No. 1)	DESKU, ENVIS (RP), Kalyani, W.B, India	2021	Soft copy and hard copy	1. Ecorestoration of Marine Environment 2. Ecological Footprint and Sustainability 3. Ecological Functions of Dung Beetles	It describes the coastal and marine ecosystems, concept, inssues and strategies of ecological footprint, and the importance of dung beetles Link: http://deskuenvis.nic.in/pdf/newslet38-1.pdf
2	Newsletter on 'Resource Recovery from By-products' (Vol. No. 38, Issue No. 2)	DESKU, ENVIS (RP), Kalyani, W.B, India	2021	Soft copy and hard copy	1. Biochar from Biomass Wastes: A Novel and Sustainable Material for Environmental Applications 2. Resource from fish by-products	It describes the synthesis and application of 'Biochar' and utilization of by-products from fish waste as potential resource. Link: http://deskuenvis.nic.in/pdf/newslet38-2.pdf

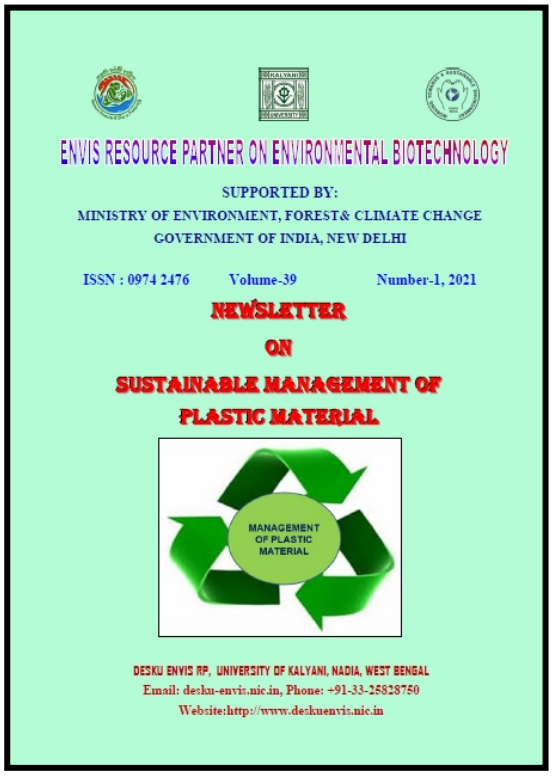
3	ENVIS Newsletter on 'Sustainable Management of Plastic Material' (Vol. No. 39, Issue No. 1)	DESKU, ENVIS (RP), Kalyani, W.B, India	2021	Soft copy and hard copy	1. Use Plastics only through Sustainable Urban Plastic Waste Management 2. Utilization of Waste Plastics in the Construction of Flexible Pavement- Not¬ to ban but to plan	It describes the ably sums up the trouble created by uncontrolled use of plastics and advocates sustainable use, reuse and controlled use of plastics. We cannot wish away plastics from our lives. But we can learn to use limit its use, and do it wisely. Link: http://deskuenvis.nic.in/pdf/newslet39-1.pdf
4	ENVIS Newsletter on 'Green Chemistry and Biodegradable Plastic' (Vol. No. 39, Issue No. 2)	DESKU, ENVIS (RP), Kalyani, W.B, India	2021	Soft copy and hard copy	1. Green Chemistry and the Environment 2. Bioplastics - a new dawn of human civilization 3. Bioplastic from Mocroorganisms	It describes the Green Chemistry and Bio-plastics, which are important. While Bio-plastics are either biologically modified plastics or plastics that degrade in the environment like biomlecules and Green Chemistry is an alternate way of doing chemistry, that not only is environment friendly, but also use less resource. Link: http://deskuenvis.nic.in/newsletter.asp?year=2021&archive=0

Details of Newsletter published

1. ENVIS Newsletter on 'Environmental Sustainability and Ecological Footprint '' (Vol. No. 38, Issue No. 1)	
	It describes the synthesis and application of 'Biochar' and utilization of by- products from fish waste as potential resource. **Link:** http://deskuenvis.nic.in/pdf/newslet38-1.pdf

2.ENVIS Newsletter on 'Resource Recovery from By-products' (Vol. No. 38, Issue No. 2)	
	It describes how the Biological diversity is the key indicator of the healthy ecosystem. Certain species are affected by environmental pollutions and anthropogenic activities, so some species are endangered and extinct day by day. But the extinction of a species may have impacts on entire ecosystems Link: http://deskuenvis.nic.in/pdf/newslet36-2.pdf

3.ENVIS Newsletter on 'Sustainable Management of Plastic Material' (Vol. No. 39, Issue No. 1)



It describes the ably sums up the trouble created by uncontrolled use of plastics and advocates sustainable use, reuse and controlled use of plastics. We cannot wish away plastics from our lives. But we can learn to use limit its use, and do it wisely

Link: http://deskuenvis.nic.in/pdf/newslet39-1.pdf

4. ENVIS Newsletter on 'Green Chemistry and Biodegradable Plastics' (Vol. No. 39, Issue No. 2)

It describes the Green Chemistry and Bio-plastics, which are important. While Bio-plastics are either biologically modified plastics or plastics that degrade in the environment like biomlecules, Green Chemistry is an alternate way of doing chemistry, that not only is environment friendly, but also use less resource.

Link: http://deskuenvis.nic.in/newsletter.asp?year=2021&archive=0

8.2 Abstract Volume for FY- 2021-2022

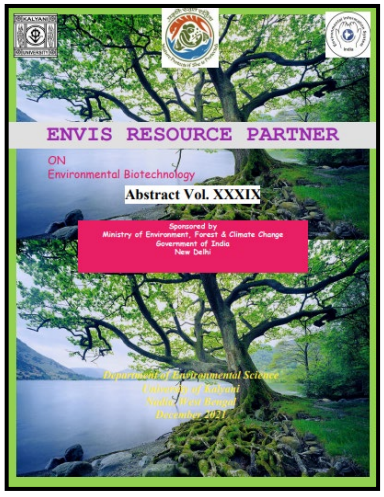
Sl. No	Title	Publisher	Year	Type of publication	Content/coverage of topics	Relevance and URL
1	Abstracts volume (Dec 2021- Vol. No. 38)	DESKU, ENVIS (RP), Kalyani, W.B, India	2021	Soft copy and hard copy	Abstract of research papers on Subject related 16 Thematic areas	http://deskuenvis.nic.in/pdf/abstract38.pdf
2	Abstracts volume (Dec 2021- Vol. No. 39)	DESKU, ENVIS (RP), Kalyani, W.B, India	2021	Soft copy and hard copy	Abstract of research papers on Subject related 16 Thematic areas	http://deskuenvis.nic.in/pdf/abstract39.pdf

Details of Abstract volumes

1. Abstracts volume (Dec 2021- Vol. No. 38)

Abstract of research papers on Subject related 16 Thematic areas (1.Biofertilizer, 2.Biopesticide, 3.Bioenergy, 4.Bio-composting, 5.Bioaccumulation, 6.Agricultural Biotechnology, 7.Bio-sensor, 8.Biodegradation, 9.Bio-remediation, 10.Bio-marker, 11.Biotransformation, 12.Pollen Biotechnology, 13.Bioengineering, 14.Policy Issues, 15.Nano biotechnology, 16.Biomimicry) from Research journals, Online and books

2. Abstracts volume (Dec 2021- Vol. No. 39)



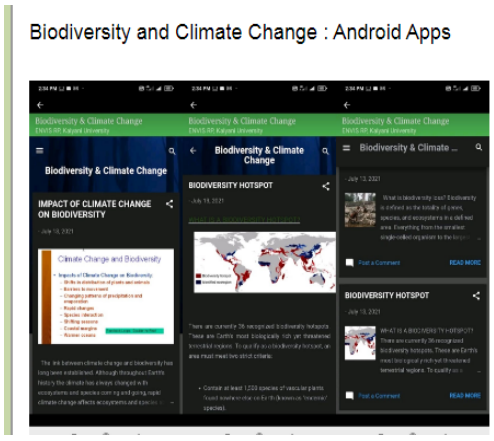
Abstract of research papers on Subject related 16 Thematic areas (1.Biofertilizer, 2.Biopesticide, 3.Bioenergy, 4.Bio-composting, 5.Bioaccumulation, 6.Agricultural Biotechnology, 7.Bio-sensor, 8.Biodegradation, 9.Bio-remediation, 10.Bio-marker, 11.Biotransformation, 12.Pollen Biotechnology, 13.Bioengineering, 14.Policy Issues, 15.Nano biotechnology, 16.Biomimicry) from Research journals, Online and books

8.3 Mobile Apps for FY- 2021-2022

Sl. No	Title	Publisher	Year	Type of publication	Content/coverage of topics	Relevance and URL
1	Biodiversity and Climate Change	DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B,India	2021	Mobile application available in google play store	Biodiversity and Climate Change : Android Apps	https://play.google.com/store/apps/details?id=io.kodular.appypub.BiodiversityANDclimatechange
2	Urban Ecosystem	DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B, India	2021	Mobile application available in google play store	Urban Ecosystem	https://play.google.com/store/apps/details?id=appinventor.ai_appypub.Urban_Ecosystem
3	Biosensor	DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B, India	2021	Mobile application available in google play store	Biosensor	https://play.google.com/store/apps/details?id=com.wBioSensor_15334475
4	Biomimicry	DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B, India	2021	Mobile application available in google play store	Biomimicry	https://play.google.com/store/apps/details?id=com.wBiomimicryImitationoflivings_15348802

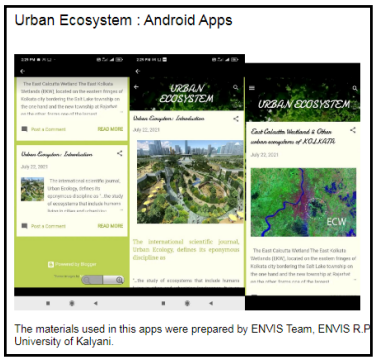
Details About mobile apps

1. Mobile Apps on Biodiversity and Climate Change



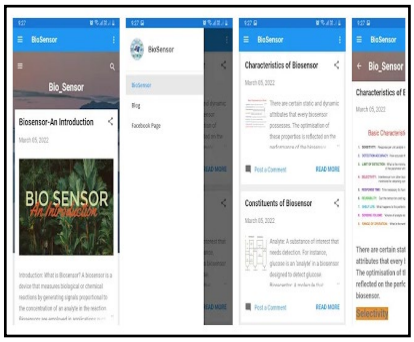
DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B, India developed the mobile app. It is available in google play store. It gives the information how climate change affects the biodiversity.

2. Mobile Apps on Urban Ecosystem



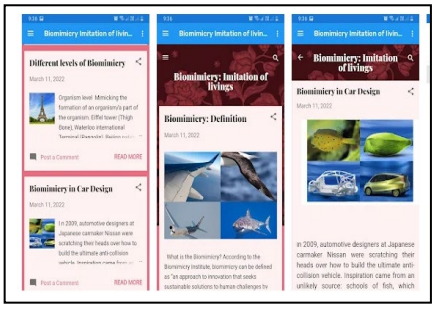
DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B, India developed the mobile app. It is available in google play store. It gives the information about Urban Ecosystem

3. Mobile Apps on Biosensor



DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B, India developed the mobile app. It is available in google play store. It gives the information about Biosensor

4. Mobile Apps on Biomimicry



DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B, India developed the mobile app. It is available in google play store. It gives the information about Biomimicry

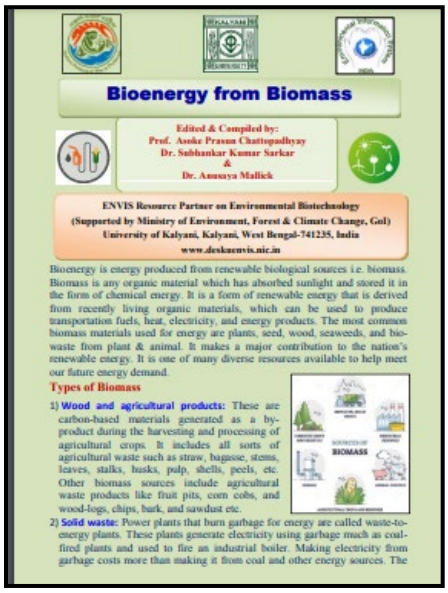
8.4 Review Article/abstract for FY- 2021-2022

Sl. No	Title	Publisher	Year	Type of publication	Content/coverage of topics	Relevance and URL
1.	Roy, j., Samal, A., Maity, J.P., Bhattachary, P., **Mallick, A.**, and Santra, S.C. (2022). Distribution of heavy	International Academic Publishing House (IAPH)	2022	Online/offline	Distribution of heavy metals in the sediments of Hooghly, Jalangi and	https://qtanalytics.in/journals/index.php/IJERR/article/view/1410

	metals in the sediments of Hooghly, Jalangi and Churni river in the regions of Murshidabad and Nadia Districts, India International Journal of Experimental Research and Review. Vol 27): 59-68.				Churni river in the regions of Murshidabad and Nadia Districts, India.	
2.	Samal, A., Bhattachary, P., Maity, J.P., **Mallick, A.,** and Santra, S.C. (2021). Phytoremediation of arsenic contaminated soil and water through some hyperaccumulator pteridophytic plants. The 8th International Congress & Exhibition on Arsenic in the Environment, Wageningen, The Netherlands 07 Jun 2021 - 10 Jun 2021.	ISGSD	2021	online	Phytoremediation of arsenic contaminated soil and water through some hyperaccumulator pteridophytic plants. The 8th International Congress & Exhibition on Arsenic in the Environment	https://www.isgsd.org/congress/2020-8th-international-congress/
3.	ISSN : 0974 2476 Volume-38 Number-2(Resource Recovery from By-products)	DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B,India	2021	Hard copies distribution and online dissemination	Resource from fish by-products	http://deskuenvis.nic.in/pdf/newslet38-2.pdf
4.	ISSN : 0974 2476 Volume-39 Number-2 (Green chemistry and Biodegradable plastics)	DESKU, ENVIS RP on Environmental Biotechnology, K.U Kalyani, W.B,India	2021	Hard copies distribution and online dissemination	Bioplastic from microorganisms	http://deskuenvis.nic.in/newsletter.asp?year=2021&archive=0

8. 5 leaflet/handout for FY- 2021-2022

Sl. No	Title	Publisher	Year	Type of publication	Content/coverage of topics	Relevance and URL
1	Handout on Bioenergy from Biomass	ENVIS RP on Environmental Biotechnology, K.U	2021	Soft copy	Details about the theme of the Bioenergy from Biomass	http://deskuenvis.nic.in/pdf/leaflet%20on%20Bioenergy%20from%20biomass.pdf



Bioenergy from Biomass

Edited & Compiled by:
Prof. Asoke Prasun Chattopadhyay
Dr. Subhankar Kumar Sarkar
&
Dr. Anusaya Mallick

ENVIS Resource Partner on Environmental Biotechnology
(Supported by Ministry of Environment, Forest & Climate Change, GoI)
University of Kalyani, Kalyani, West Bengal-741235, India
www.deskuenvis.nic.in

Bioenergy is energy produced from renewable biological sources i.e. biomass. Biomass is any organic material which has absorbed sunlight and stored it in the form of chemical energy. It is a form of renewable energy that is derived from recently living organic materials, which can be used to produce transportation fuels, heat, electricity, and energy products. The most common biomass materials used for energy are plants, seed, wood, seaweeds, and bio-waste from plant & animal. It makes a major contribution to the nation's renewable energy. It is one of many diverse resources available to help meet our future energy demand.

Types of Biomass

1) **Wood and agricultural products:** These are carbon-based materials generated as a by-product during the harvesting and processing of agricultural crops. It includes all sorts of agricultural waste such as straw, bagasse, stems, leaves, stalks, husks, pulp, shells, peels, etc. Other biomass sources include agricultural waste products like fruit pits, corn cobs, and wood-logs, chips, bark, and sawdust etc.

2) **Solid waste:** Power plants that burn garbage for energy are called waste-to-energy plants. These plants generate electricity using garbage much as coal-fired plants and used to fire an industrial boiler. Making electricity from garbage costs more than making it from coal and other energy sources. The

main advantage of burning solid waste is it reduces the amount of garbage dumped in landfills by 60 to 90%, and reduces the cost of landfill disposal.

3) **Landfill gas:** Bacteria and fungi degraded plants and animals biomass in natural process and produce flammable methane gas in anaerobic condition. Landfills can collect the methane gas, purify it, and then use it as an energy source for safety and environmental reasons.

4) **Alcohol fuels:** Wheat, corn, and other crops can be converted into a variety of liquid fuels including ethanol and methanol.

Categories of biofuels

Biofuels are generally classified into four categories. They are

i) First generation biofuels - First-generation biofuels are made from sugar, starch, and vegetable oil. Common first-generation biofuels include Bioalcohols, Biodiesel, Vegetable oil, Bioethers, Biogas. First-generation biofuel processes are useful but there is a threshold above which they cannot produce enough biofuel without threatening food supplies and biodiversity.

ii) Second generation biofuels - Second Generation Biofuel are also called "olive green" or "cellulosic-ethanol" fuel, and are produced from non-food crops. Waste vegetable oil, forest residue, industry residue, and sustainable biomass are the primary feedstock for the production of second generation biofuels.

iii) Third generation biofuels - Third Generation Biofuels are produced from micro and macro-organisms like algae. It is also known as "algal fuel" or "oilage" since they are produced from the algae. It is 10times higher than the second generation biofuel

iv) Fourth generation biofuels - The fourth-generation biofuels made from genetically engineered crops combine genetically engineered feedstock with genomically synthesized microorganisms, such as cyanobacteria, to efficiently generate bioenergy.

Biofuel production
1st Generation
2nd Generation
3rd Generation
4th Generation

8.6 Boucher for FY- 2021-2022

Sl. No	Title	Publisher	Year	Type of publication	Content/coverage of topics	Relevance and URL
1	International Day for Biological Diversity - 2021	ENVIS RP on Environmental Biotechnology, K.U	2021	Online	Online Poster and Drawing Competition were organized to celebrate the International Day for Biological Diversity on 22nd May, 2021.	http://deskuenvis.nic.in/pdf/DESKU%20-Outreach%20Programmes%20for%20School%20and%20College%20students.pdf
						
2	Brochure of on World Environment Day-2021	ENVIS RP on Environmental Biotechnology, K.U	2021	Online	Webinar on World Environment Day-2021	http://deskuenvis.nic.in/pdf/Biologic%20Drugs%20and%20Biosimilars.pdf
						

3	Brochure on World Ozone Day	ENVIS RP on Environmental Biotechnology, K.U	2021	Online	Debate and drawing competitions among school children were held.	http://deskuenvis.nic.in/Webiner.jpg

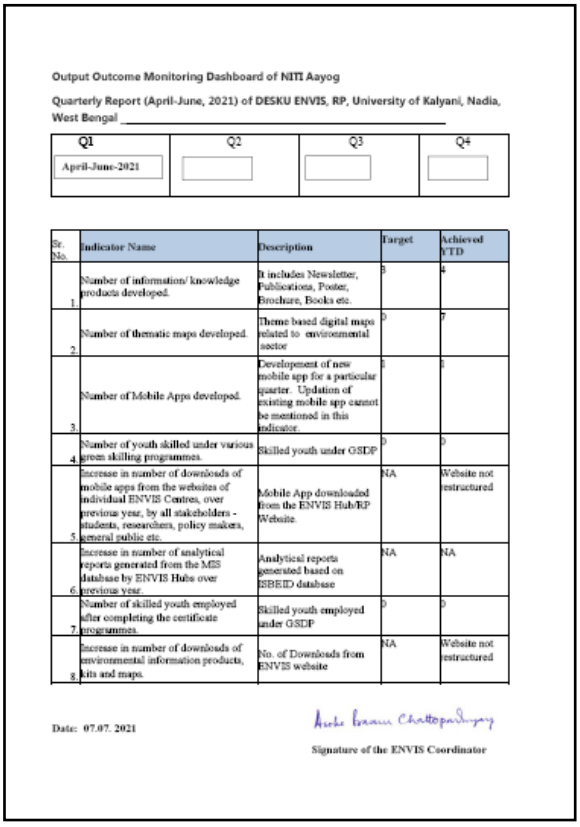
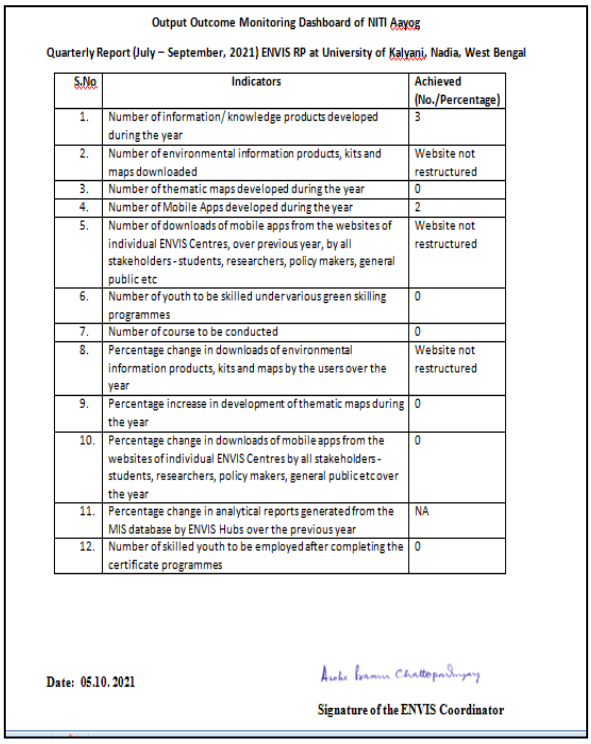
4	**Brochure on National Science Day**	ENVIS RP on Environmental Biotechnology, K.U	2022	Online	Brochure on National Science Day	http://deskuenvis.nic.in/pdf/science%20day.pdf

8.7 Poster for FY- 2021-2022

1	Poster on say no to Single use plastic was prepared	ENVIS RP on Environmental Biotechnology, K.U	2021	Online	Poster on Single use plastic was prepared	http://deskuenvis.nic.in/pdf/poster%20on%20say%20no%20to%20plastic%20pollution.jpg
						
2	Poster on National Pollution Control Day-2021	ENVIS RP on Environmental Biotechnology, K.U	2021	Online	Poster on National Pollution Control Day-2021	http://deskuenvis.nic.in/pdf/Desku-poster-national%20pollution%20day.pdf

3	Poster on World Wetland Day	ENVIS RP on Environmental Biotechnology, K.U	2021	Online	Poster describes wetlands of East Calcutta	http://deskuenvis.nic.in/pdf/World%20Wetland%20Day-2022.jpg

8.8 Quarterly DESKU ENVIS (RP) reports for FY-2021-2022.

Sl. NO	Reports	Glimpse of the report
1	April-June, 2021	
2	July-September, 2021	

Output Outcome Monitoring Dashboard of NITI Aayog

Quarterly Report (April-June, 2021) of DESKU ENVIS, RP, University of Kalyani, Nadia, West Bengal

Q1	Q2	Q3	Q4
April-June-2021			

Sr. No.	Indicator Name	Description	Target	Achieved YTD
1.	Number of information/ knowledge products developed.	It includes Newsletter, Publications, Poster, Brochure, Books etc.	3	4
2.	Number of thematic maps developed.	Theme based digital maps related to environmental sector	0	7
3.	Number of Mobile Apps developed.	Development of new mobile app for a particular quarter. Updation of existing mobile app cannot be mentioned in this indicator.	0	1
4.	Number of youth skilled under various green skilling programmes.	Skilled youth under GSDP	0	0
5.	Increase in number of downloads of mobile apps from the websites of individual ENVIS Centres, over previous year, by all stakeholders - students, researchers, policy makers, general public etc.	Mobile App downloaded from the ENVIS Hub/RP Website.	NA	Website not restructured
6.	Increase in number of analytical reports generated from the MIS database by ENVIS Hubs over previous year.	Analytical reports generated based on ISBEID database	NA	NA
7.	Number of skilled youth employed after completing the certificate programmes.	Skilled youth employed under GSDP	0	0
8.	Increase in number of downloads of environmental information products, kits and maps.	No. of Downloads from ENVIS website	NA	Website not restructured

Date: 07.07. 2021

Signature of the ENVIS Coordinator

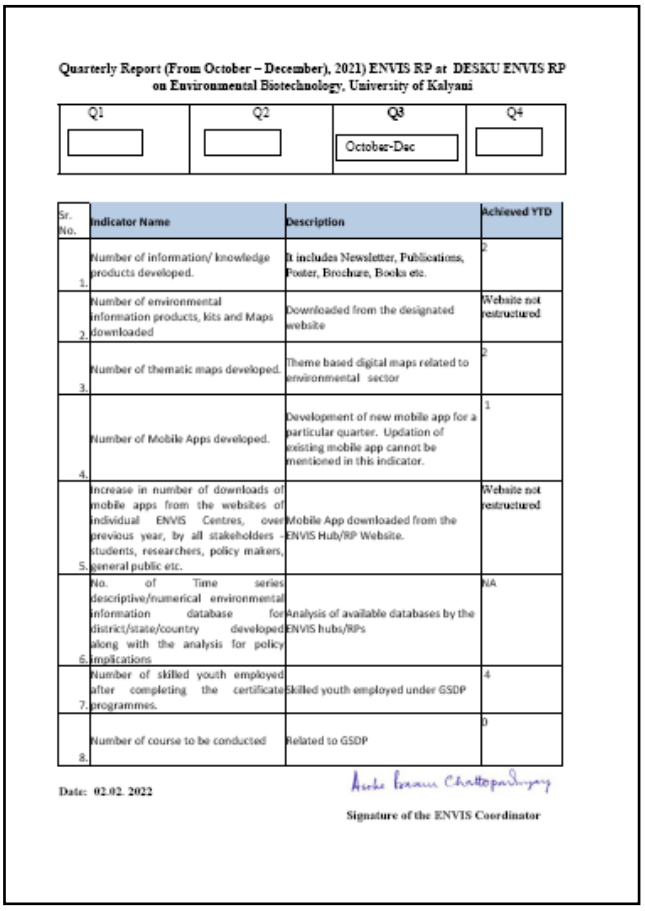
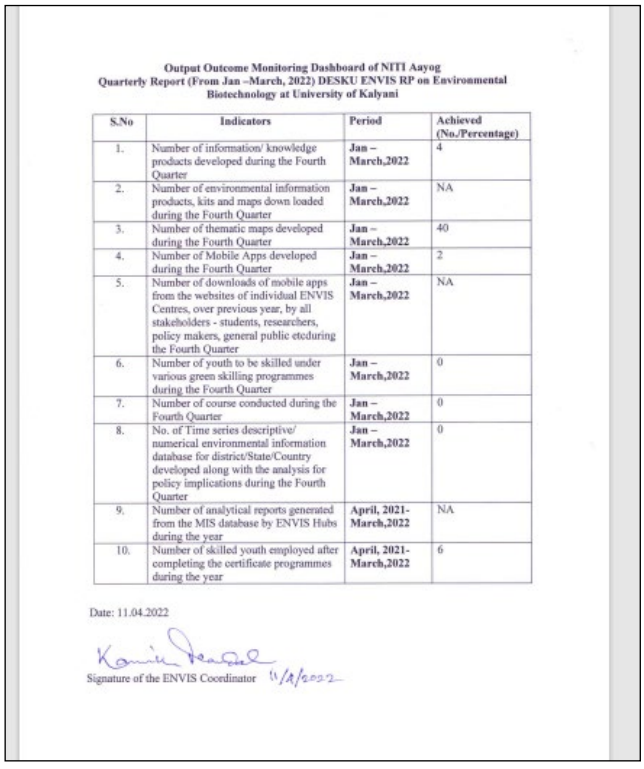
Output Outcome Monitoring Dashboard of NITI Aayog

Quarterly Report (July – September, 2021) ENVIS RP at University of Kalyani, Nadia, West Bengal

S.No	Indicators	Achieved (No./Percentage)
1.	Number of information/ knowledge products developed during the year	3
2.	Number of environmental information products, kits and maps downloaded	Website not restructured
3.	Number of thematic maps developed during the year	0
4.	Number of Mobile Apps developed during the year	2
5.	Number of downloads of mobile apps from the websites of individual ENVIS Centres, over previous year, by all stakeholders - students, researchers, policy makers, general public etc	Website not restructured
6.	Number of youth to be skilled under various green skilling programmes	0
7.	Number of course to be conducted	0
8.	Percentage change in downloads of environmental information products, kits and maps by the users over the year	Website not restructured
9.	Percentage increase in development of thematic maps during the year	0
10.	Percentage change in downloads of mobile apps from the websites of individual ENVIS Centres by all stakeholders - students, researchers, policy makers, general public etc over the year	0
11.	Percentage change in analytical reports generated from the MIS database by ENVIS Hubs over the previous year	NA
12.	Number of skilled youth to be employed after completing the certificate programmes	0

Date: 05.10. 2021

Signature of the ENVIS Coordinator

3	**October-December, 2020**	
4	**January-March, 2022**	

Quarterly Report (From October – December), 2021) ENVIS RP at DESKU ENVIS RP on Environmental Biotechnology, University of Kalyani

Q1	Q2	Q3	Q4
		October-Dec	

Sr. No.	Indicator Name	Description	Achieved YTD
1.	Number of information/ knowledge products developed.	It includes Newsletter, Publications, Poster, Brochure, Books etc.	2
2.	Number of environmental information products, kits and Maps downloaded	Downloaded from the designated website	Website not restructured
3.	Number of thematic maps developed.	Theme based digital maps related to environmental sector	2
4.	Number of Mobile Apps developed.	Development of new mobile app for a particular quarter. Updation of existing mobile app cannot be mentioned in this indicator.	1
5.	Increase in number of downloads of mobile apps from the websites of individual ENVIS Centres, over previous year, by all stakeholders - students, researchers, policy makers, general public etc.	Mobile App downloaded from the ENVIS Hub/RP Website.	Website not restructured
6.	No. of Time series descriptive/numerical environmental information database for district/state/country developed along with the analysis for policy implications	Analysis of available databases by the ENVIS hubs/RPs	NA
7.	Number of skilled youth employed after completing the certificate programmes.	Skilled youth employed under GSDP	4
8.	Number of course to be conducted	Related to GSDP	0

Date: 02.02. 2022

Signature of the ENVIS Coordinator

Output Outcome Monitoring Dashboard of NITI Aayog
Quarterly Report (From Jan –March, 2022) DESKU ENVIS RP on Environmental Biotechnology at University of Kalyani

S.No	Indicators	Period	Achieved (No./Percentage)
1.	Number of information/ knowledge products developed during the Fourth Quarter	Jan – March,2022	4
2.	Number of environmental information products, kits and maps down loaded during the Fourth Quarter	Jan – March,2022	NA
3.	Number of thematic maps developed during the Fourth Quarter	Jan – March,2022	40
4.	Number of Mobile Apps developed during the Fourth Quarter	Jan – March,2022	2
5.	Number of downloads of mobile apps from the websites of individual ENVIS Centres, over previous year, by all stakeholders - students, researchers, policy makers, general public etcduring the Fourth Quarter	Jan – March,2022	NA
6.	Number of youth to be skilled under various green skilling programmes during the Fourth Quarter	Jan – March,2022	0
7.	Number of course conducted during the Fourth Quarter	Jan – March,2022	0
8.	No. of Time series descriptive/ numerical environmental information database for district/State/Country developed along with the analysis for policy implications during the Fourth Quarter	Jan – March,2022	0
9.	Number of analytical reports generated from the MIS database by ENVIS Hubs during the year	April, 2021-March,2022	NA
10.	Number of skilled youth employed after completing the certificate programmes during the year	April, 2021-March,2022	6

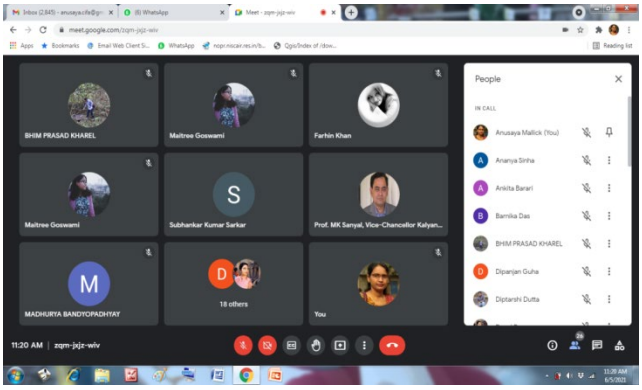
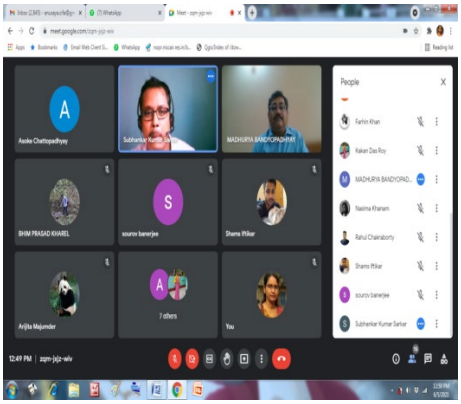
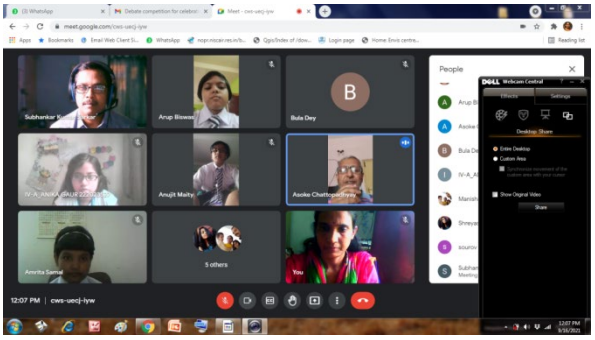
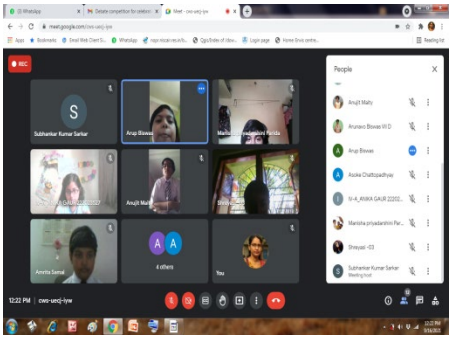
Date: 11.04.2022

Signature of the ENVIS Coordinator 11/4/2022

8.9 Awareness Programmes Organised (Titles of Programmes, content and coverage of topics, Relevance of the theme, number of participants, Methods adopted for the dissemination of the knowledge and information)

Sl. No	Title of the Programmes	Content/Coverage of topics	Relevance of the theme	Methods for dissemination of knowledge
1	International Day for Biological Diversity - 2021	Online Poster and Drawing Competition were organized to celebrate the International Day for Biological Diversity on 22nd May, 2021.	Celebration of International Day for Biological Diversity	Online
2	World Environmental Day, 2021 in University of Kalyani, Nadia, West Bengal	World Environmental Day theme on 5th June, 2021. More than 60 students participated in this webinars.	World Environmental Day theme	Awareness through online
3	World Ozone Day, 2021 in University of Kalyani, Nadia, West Bengal	Celebrated the World Ozone Day on 16th September, 2021, an online Drawing & debate Competition was organized among School children in different categories. More than 50 students participated in this webinars.	World Ozone Day theme	Awareness programme through online Drawing & Debate Competition was organized among School children in different categories.
4	School awareness programme.	DESKU ENVIS RP was organized an awareness programme on "ENVIRONMENTAL BIOTECHNOLOGY" held at Deshpriya high school, Gayeshpur, Nadia	Awareness on environmental issues	Offline

		on 23rd November 2021. More than 50 young NCC cadets, of class VI to IX, participated in the programme.		
5	School awareness programme	School Awareness programme on Say no to single use plastic at Gayespur Kishalaya HS school on 10th December 2022. More than 80 participants	Awareness on environmental issues	Offline
6	Village Awareness programme	Environmental Awareness programme among 5SSG Groups such as 1. Ranaghat Maa Saradha Mahila Samit 2. Ekta Mahila Samity 3. Disha Aikantik Samity 4. Sruti Mahila Gosthi 5. Samvab Parivar - on 5th January 2022. Total 160 participants were participated in this programme.	Awareness on environmental issues	Offline
7	Display of ENVIS Publications in Kalyani Book Fair-2021	DESKU ENVIS RP participated in Kalyani book fair 2021 on 25th November, 2021 for displaying ENVIS activities and publications of the centre in Kalyani University Stall (No-43).	Displaying ENVIS activities and publications	Offline

8	School awareness programme.	DESKU ENVIS RP was organized an awareness programme on "ENVIRONMENTAL BIOTECHNOLOGY" held at Belgharia high school, Belgharia, Kolkata on 23rd March, 2022. More than 80 students participated in the programme.	Awareness on environmental issues	Offline
				
Online seminar on World Environmetal Day			Online seminar on World Environmetal Day	
				
Online Competition on World Ozone Day			Online Competition on World Ozone Day	

Awareness programme in Gayashpur Deshpriya School

Awareness programme in Gayashpur Deshpriya School

Display of ENVIS Publications in Kalyani Book Fair-2021

Display of ENVIS Publications in Kalyani Book Fair-2021

Outreach programme in Belgharia School

Outreach programme in Belgharia School

8. 10 Green Skill Development Program (GSDP)- NA

SL.NO	Courses offered	Course starting date batch-wise	Batch-size	Sanctioned amount during FY 2019-20	Remarks/current status

8.11 Webinars and online competitions

8.11.1 Online competition on International Day for Biological Diversity

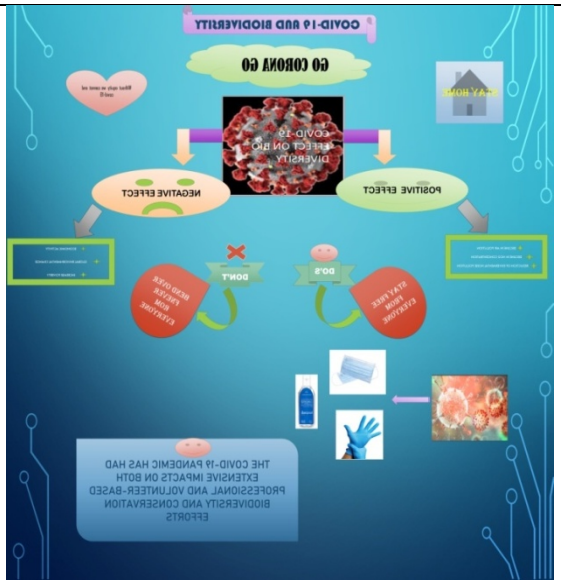
DESKU ENVIS Resource Partner on Environmental Biotechnology, University of Kalyani, Celebrated the International Day for Biological Diversity through online competitions such as poster and drawing competitions on 22nd May, 2021. More than 400 participants were participated on this occasion.

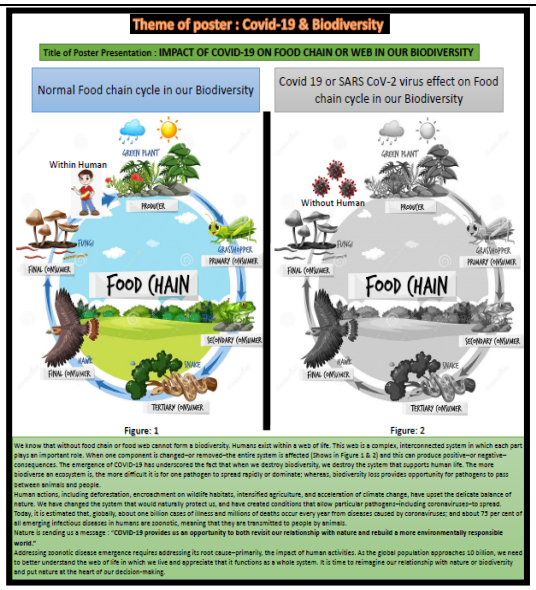
Category-I

Category-II

Category-III

Name-Prithiraj Halder, Mother's name -Rina Halder, Class-Botany Honours 1st year, College- Serampore College(co-ed), University of Calcutta

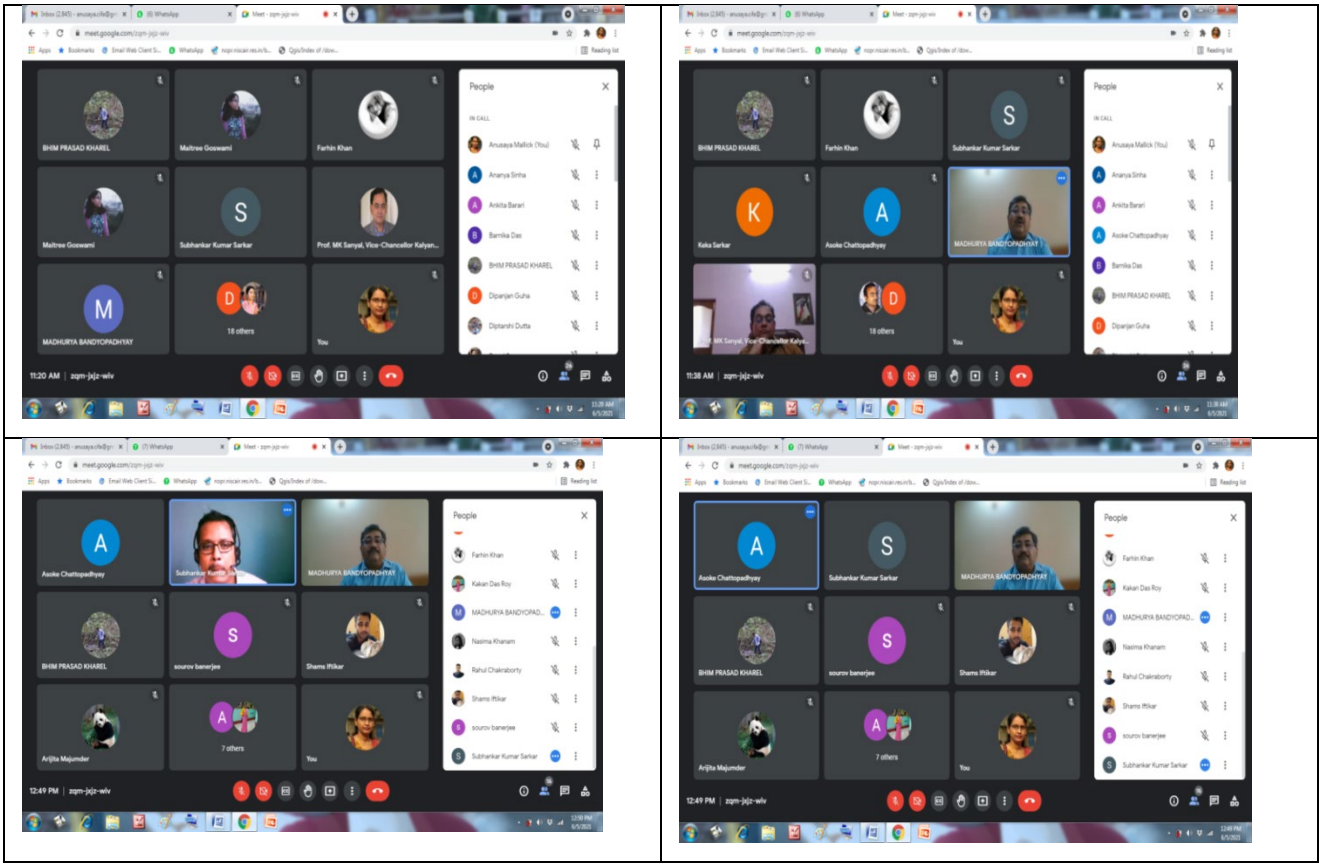




Selected Posters on Biodiversity day

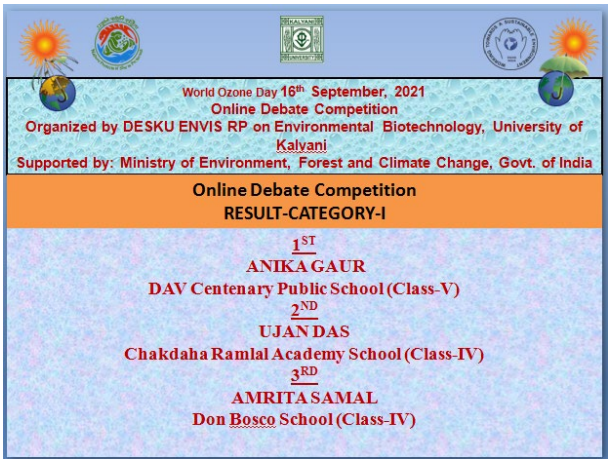
8.11.2 Webinar on Biologic Drugs and Biosimilars'

DESKU ENVIS RP on Environmental Biotechnology organized a webinar on '**Biologic Drugs and Biosimilars'** on the occasion of World Environment Day, 5th June, 2021. At the outset, the Coordinator, ENVIS-RP of the University of Kalyani, Prof. Asoke P. Chattopadhyay welcomed the dignitaries, the speaker of the webinar and the participants. He mentioned that theme of the World Environment Day in 2021 is 'Ecosystem Retoration'. Then the webinar was inaugurated by the Hon'ble Vice Chancellor, Prof. (Dr.) Manas Kumar Sanyal, University of Kalyani. Dr. Suman Bandyopadhyay, Head, Upstream Process Development, Dr. Reddy's Laboratories Ltd., Hyderabad delivered a detailed lecture on Biologic Drugs and Biosimilars.



8.11.3. Online competition on World Ozone Day

DESKU ENVIS Resource organized a debate and drawing competition among school children on the occasion of the World Ozone Day, 16th September, 2021, through virtual mode. A brochure for the competition was widely circulated through the website of University of Kalyani, facebook page, Whatsapp group, Twitter page and other social media. For both the competitions, participants registered through Googleform. Scanned copy of the drawing sheets (in A4 paper) were submitted by the participants. The debate competition was conducted online through GoogleMeet on 16th Sept, 2021. More than 50 participants participated in these competitions.



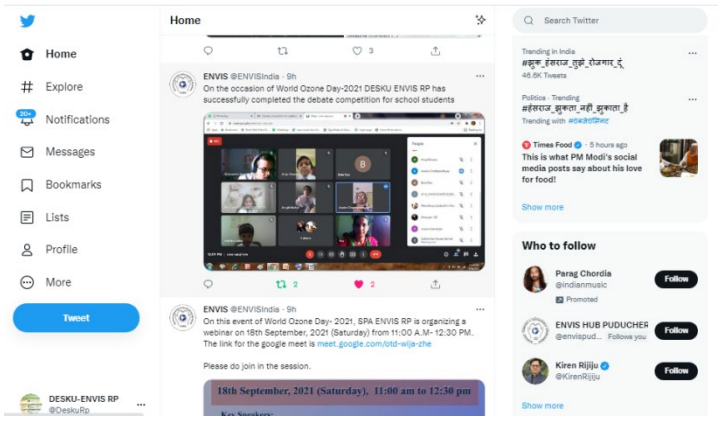
Results of the ozone day Competitions

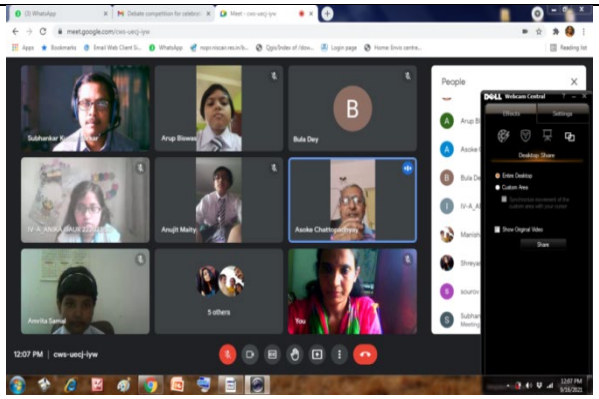
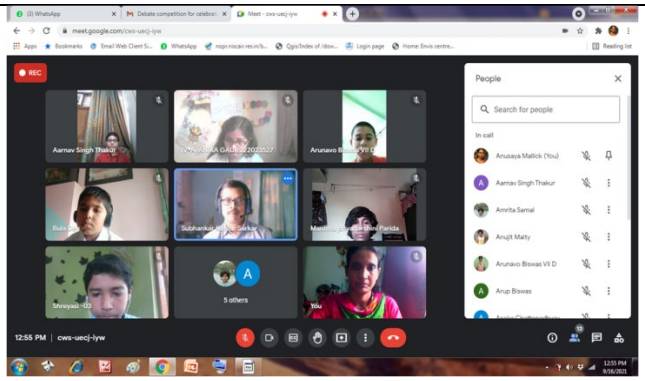
Some selected drawings of the competition

Category-I

Category-2

Social media publications by Ministry in twitter



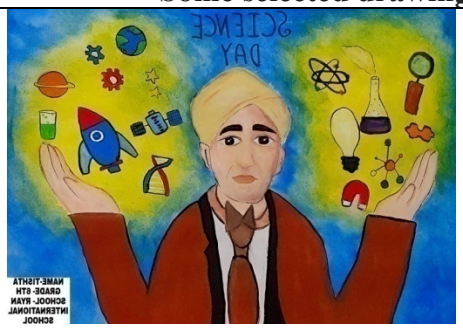
	
Online debate competiotion on Ozone Day	**Online debate competiotion on Ozone Day**

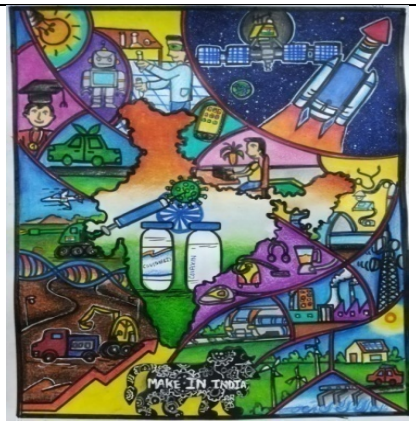
8.11.4. Online competitions on National Science Day-2022

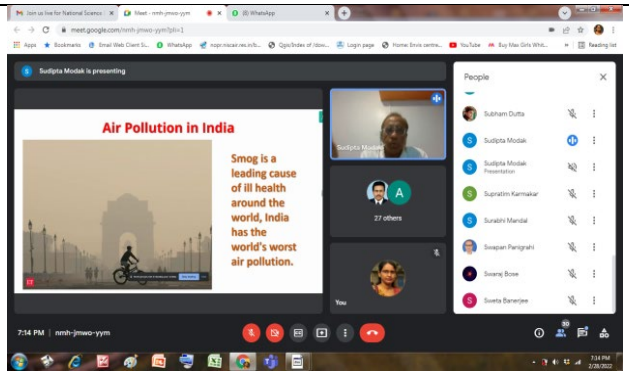
DESKU ENVIS RP organized an online Mini science project / model and Drawing Competitions to celebrate the National Science Day on 28th February, 2022 for school students.

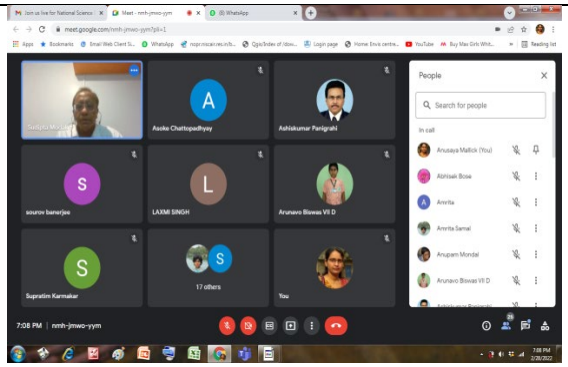
A webinar on '**Current Environmental Scenario and our Duties**' was organized on the occasion of National Science Day, 28th February, 2022. Dr. Sudipta Modak, Prof (retd) of Chemistry, City College, Kolkata, Chairman, Biodiversity Management Committee Chandernagore Municipal Cooperation, and Member of Biodiversity Management Committee Hoogly Zilla Parishad, delivered a detailed lecture on Current Environmental Scenario and our Duties.

Some selected drawing and webinar photos of Science Day









9. ENVIS Staffs Attained the ENVIS Meetings

Video Conference (VC) on Wednesday, 18th August, 2021

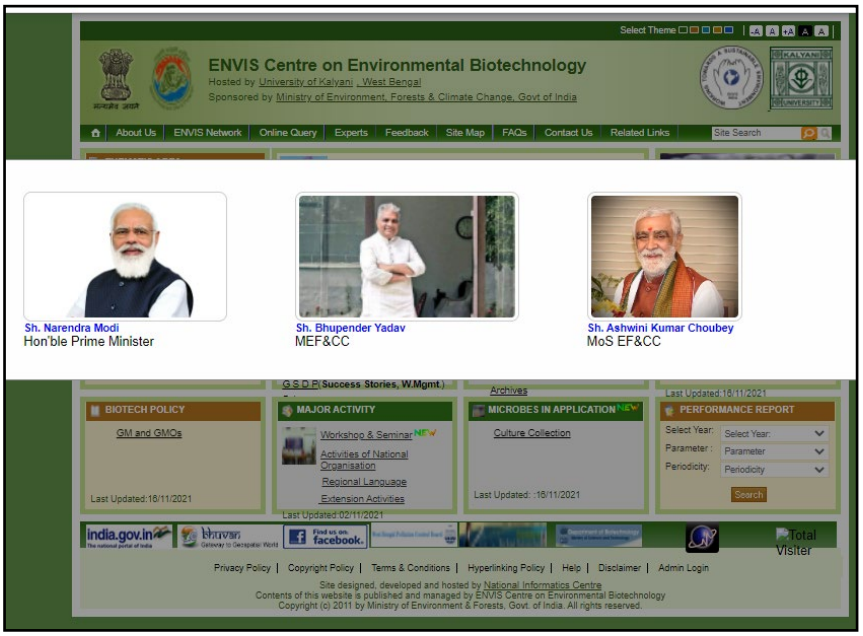
Prof. Ashoke Prasun Chattopadhya Coordinator ENVIS RP, Dr. Subhankar Kumar Sarkar, Deputy Coordinator ENVIS RP, Dr. Anusaya Mallick, Programme Officer and Mr. Sourov Banerjee, Information Officer attained the Video conference meeting on 18th August, 2021. The VC was chaired by Lipika Roy, IES, Deputy Director, Economic Division and DME Division Ministry of Environment, Forests and Climate Change, Government of India.

10. Website Update status

This is a unique theme area for data collection and dissemination with respect to Biotechnology related to environmental aspects. We have maintained a website on this aspect for last 20 years in the website **URL: http://www.deskuenvis.nic.in**. This ENVIS Resource Partner was established in June, 2002. The ENVIS RP has valuable information on Environmental Biotechnology, which is regularly updated, reformed and modified. The general objective of this centre is to collect data and information on recent developments in the field of 'Environmental Biotechnology' from different major laboratories and libraries throughout the world and to keep the database of our website updated, which is very useful, helpful and user friendly. The website is frequently accessed by researchers, students, industry personals and NGOs who are working in this and related fields and is also in high demand among general public. The centre publishes newsletters, abstract volumes, special books, leaflets, mobile apps and other knowledge products in a regular time interval. The centre also organizes workshop/ seminar/ training/ exhibition/ outreach programmes on a regular basis. The Ministry has entrusted the centre with running new programmes, viz. Green Skill Development Programme (GSDP) and Grid Based Decision Support System (GRIDSS) - for Sustainable Management of Natural Resources.

The centre also provides query services to researchers, scientific communities and other concerned people. In most of the cases replies to the specific queries are given and in a few specific cases some relevant references are provided for better information supports. The numerical data are statistically incorporated in our website with regular updating.

DESKUENVIS RP Website (deskuenvis.nic.in)



Name of website	URL	Status of reconstruction	Year	Frequency of updating the website	Subject-specific data updating	Publication updated on website	Information
DESKU ENVIS RP, Klyani, Nadia, W.B	deskuenvis.nic.in	Not restructured	2020-21	Weekly (The ENVIS website designed and updated regularly according to ENVIS secretariat guideline, All static pages are updated weekly, The dynamic database pages are updated monthly, New information are	Environmental Biotechnology	The ENVIS RP publishes regularly in every year 1. Four Newsletters 2. Two Abstract volumes 3. Leaflet 4. Mobile Apps 5. Edited books 6. Review articles 7. Hand outs related to theme area 8. Articles in both English	We are collecting the data from different major laboratories and libraries throughout the world and to keep the database of our website updated, which is very useful, helpful and user friendly. The website is frequently accessed by researchers, students, industry personals and NGOs who are working in this and related fields and is also in high demand among general public. The centre publishes newsletters, abstract volumes, special books, leaflets, mobile apps and other knowledge products in a regular time interval.

				highlighted with blinking, Old information are stored in archive)		and vernacular languages	

11. User Engagement and Interaction

User engagement and interaction		*FY 2019-20*	*FY 2020-21*	*FY 2021-22*
i.	Total number of visits	NA	NA	NA
ii.	Number of unique visits	NA	NA	NA
iii.	Reports Downloaded/Read	NA	NA	NA
iv.	Total Number of Queries received (Online, E-mail, Postal & Physical	382	210	343
v.	Number of Queries responded	382	210	343
vi.	Grade received	NA	NA	NA

**Since our Website is not restructured, we don't have the count.

** Due to following constrains the total of Number of unique visits statistics and Reports Download/ Read statistics, could not be met with. As our website is not restructured as per MOEF &CC point of view, so we are not running our statistical command functioned. The database link folder is not properly running. For security reason, NIC blocked our command base dynamic pages. So we are unable to provide such type of statistics.

11.1 Query-Answer Statistics 2021-22

Mode of Query Receipt	Number of Queries Received	Number of Queries Responded	Reasons for shortfalls, if any, and action taken to rectify
Online (CMS based website)	NA	NA	
Email (official NIC server)	89	89	NA
Postal/Telephonic (incl. hand post)	114	114	NA
Physical	140	140	NA

12. Budget Allocation and Expenditure patterns (Year Wise)

➢ **For 2021-2022**

SI. No	Sanctioned Object Head	Total Amount Sanctioned (in Rs.)	Amount Received (in Rs.) (including carry forward)	Expenditure Incurred (in Rs.)	Available Balance (in Rs.)
1	Manpower	15,82,410.00	15,82,409.00	15,82,409.00	NIL
2	**Others** (Database development, website	4,65,300.00	4,65,300.00	4,65,300.00	NIL

	maintenance, printing of Newsletters & Prakriti Map, contingency, stationery, consumables, AMC, Internet charges, training, inter-centre interaction workshops, expenses on monitoring, ISBEID Database development, Mobile App Development etc.)				
3	Travel	1,00,000.00	1,00,000.00	6,510.00	93,490.00
4	Total	21,47,710.00	21,47,709.00	20,54,219.00	93,490.00
5	Bank interest during financial year 2020-21				19,222.00
6	Net balance amount available at the end of financial year (up to 31st March, 2021)				93,490.00

13. Inventory /Record (Year-wise list of equipment's/ machinery procured under the ENVIS Scheme and/or for training under GSDP and state their use and utility- for last 3 years)

For 2021-22-NA

	Hardware item	Specification	Sanction Order with Date	Date of procurement
Procured from ENVIS Grant	-	-	-	-

For 2020-21-NA

	Hardware item	Specification	Sanction Order with Date	Date of procurement
Procured from ENVIS Grant	-	-	-	-
	-	-	-	-
	Hardware item	Specification	Sanction Order with Date	Date of procurement
Procured from ENVIS Grant	-	-	-	-

For 2019-20-NA

	Hardware item	Specification	Sanction Order with Date	Date of procurement

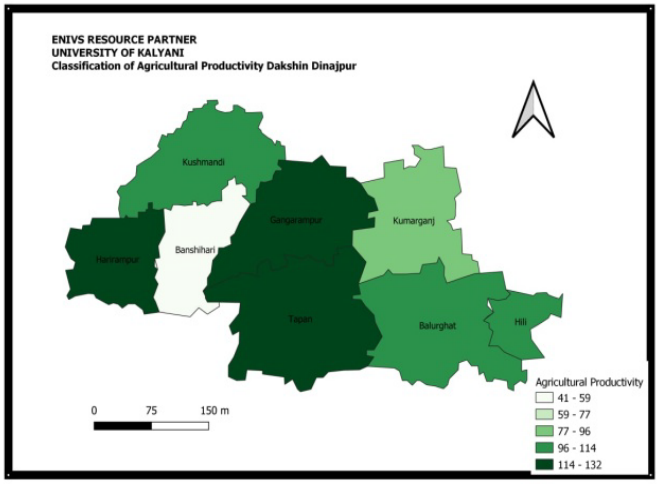
Procured from ENVIS Grant	-	-	-	-

14. National Environment Survey (NES)- a Grid-based Resource Information and Decision Support System (GRIDSS)

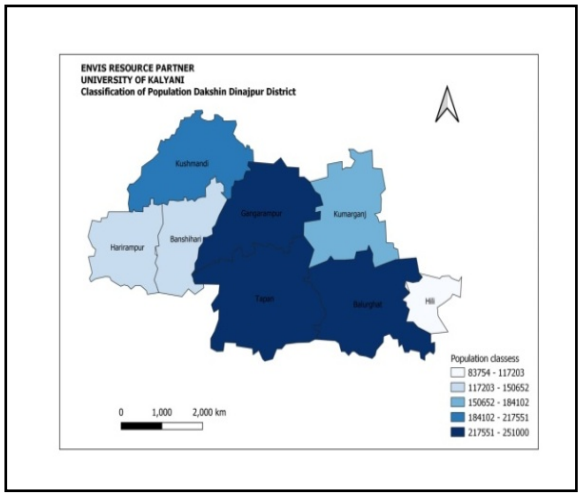
➢ Data availability status under the NES-GRIDSS-ISBEI

1. Map on Classification of Agricultural productivity of Dakshin Dinajpur District was prepared
2. Map on Classification of population of Dakshnin Dinajpur District was prepared
3. Socio-economic development of Dakshin Dinajpur District
4. Administrative map of Murshidabad District
5. Economic (population distribution) map of Murshidabad District
6. Administrative profile of Murshidabad District
7. Administrative profile of Murshidabad District (with grid)
8. Total male and female population of Murshidabad District
9. Total population of Murshidabad District
10. Land use and land cover of Murshidabad District
11. Administrative profile map of Birbhum District
12. Administrative profile map Birbhumi (with grid)
13. Birbhumi land use and land cover
14. Administrative profile of Hooghly District
15. Administrative profile of Hooghly District (with grid)
16. Land use land cover of Hoogly District
17. Potato crop Hooghly District
18. Agricultural crop production (Potato) of Hooghly District
19. Hooghly District micro watershed
20. Economic (population density) of Hooghly District
21. Types of Industry Maps of West Bengal
22. Industrial parks of selected districts of West Bengal
23. Industrial Nodal Agency map of West Bengal
24. Utility services for industrial development map of West Bengal
25. Agro climate zone of West Bengal
26. Socio economic (population density) of Howrah District
27. Administrative profile of Howrah District (with grid)
28. Land use land cover of Howrah District
29. Administrative profile of Howrah District
30. Agricultural crop of Howrah District
31. Agricultural crop (paddy) of Howrah District
32. Flood prone areas of Howrah District
33. Map of Kolkata slum area
34. Administrative profile of Kolkata District
35. Administrative profile of Kolkata District (with grid)
36. Kolkata land use and land cover
37. Kolkata Municipal corporation wards
38. Kolkata land use and land cover (2008 category)

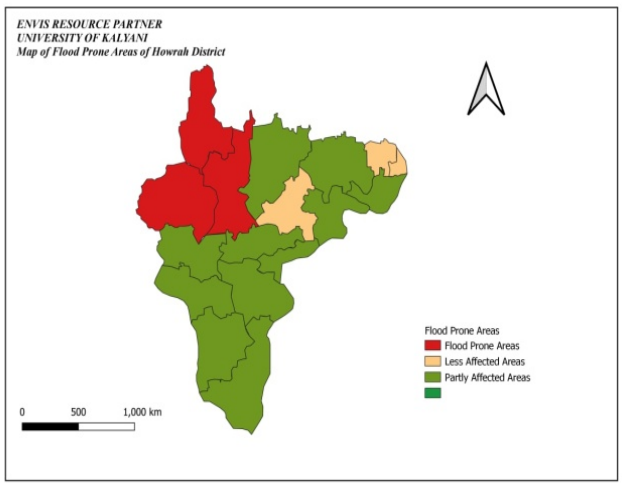
39. Central water commission Kolkata
40. Administrative profile of Nadia District
41. Population density of Nadia District
42. Administrative profile map of Nadia District (with grid)
43. Administrative profile map of Nadia District
44. Land use and land cover of Nadia District
45. Administrative profile of 24 Pargana (North)
46. Land use and land cover of 24 Pargana District (North)
47. Administrative profile of 24 Pargana District (North-with grid)
48. Administrative profile of 24 Pargana (South)
49. Administrative profile of 24 Pargana District
50. Land use and land cover of 24 Pargana District (South)
51. Administrative profile of 24 Pargana District (South-with grid)
52. Administrative profile of 24 Pargana District (South)



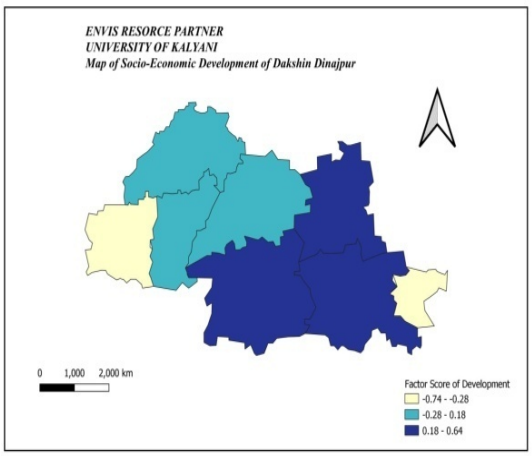
Classification of Agricultural productivity of Dakshin Dinajpur



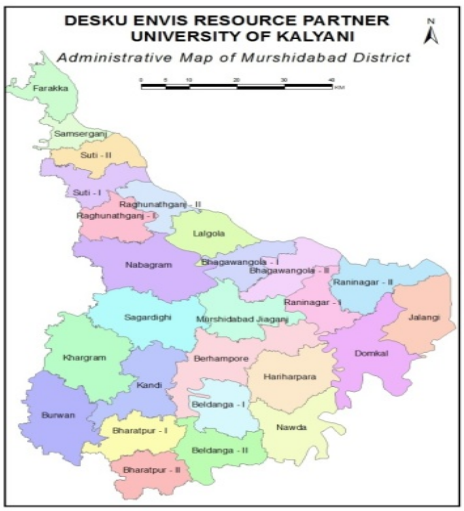
Classification of population of Dakshnin Dinajpur



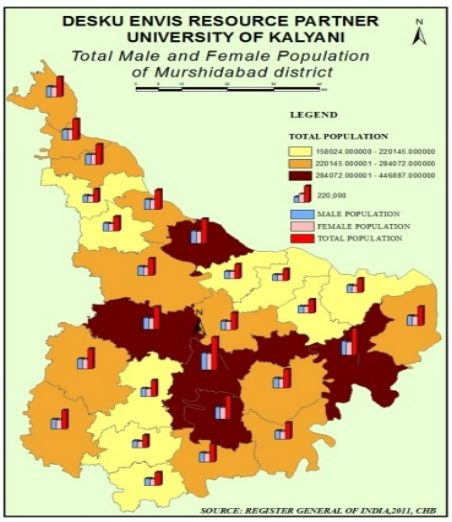
Flood prone areas of Howrah District



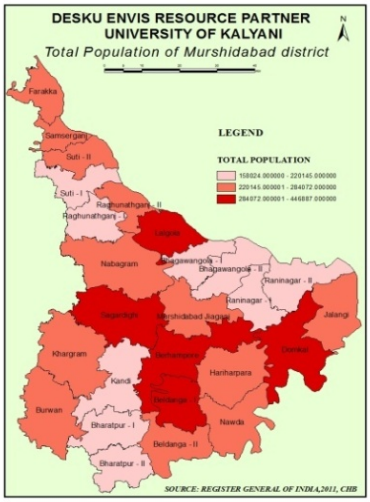
Socio-economic development of Dakshin Dinajpur District



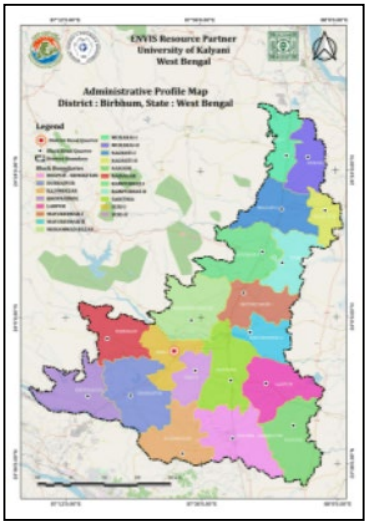
Administrative map of Murshidabad District



Total male and female population of Murshidabad District

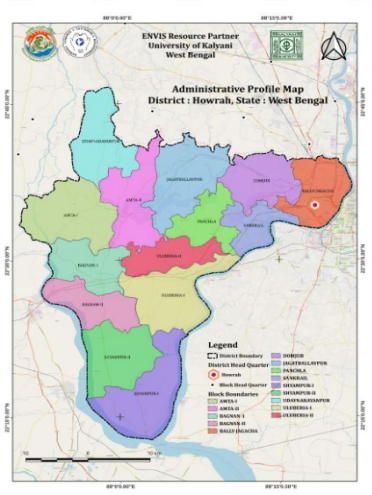


Total population of Murshidabad District

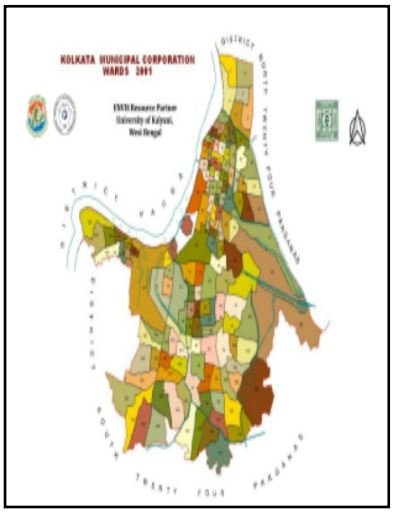
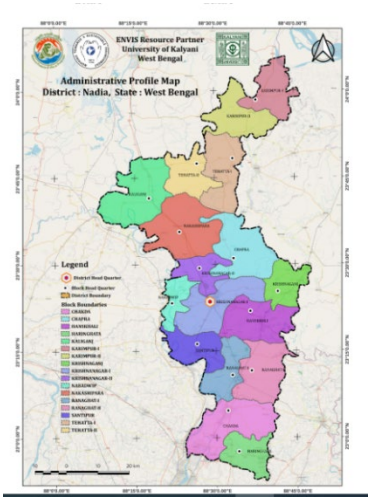
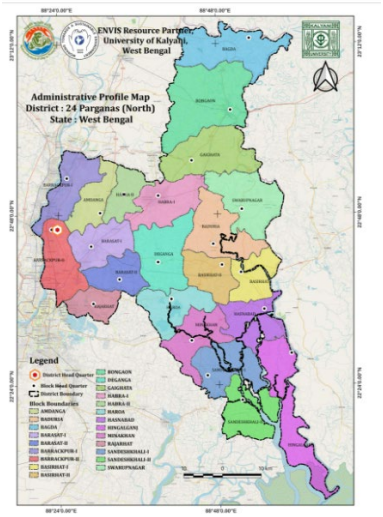
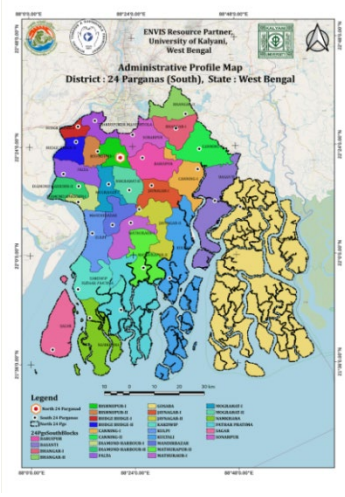


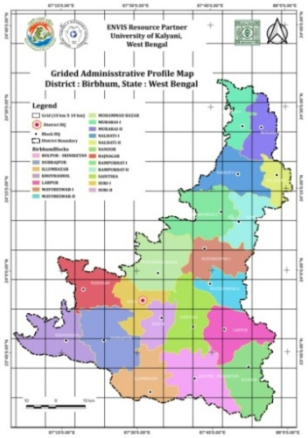
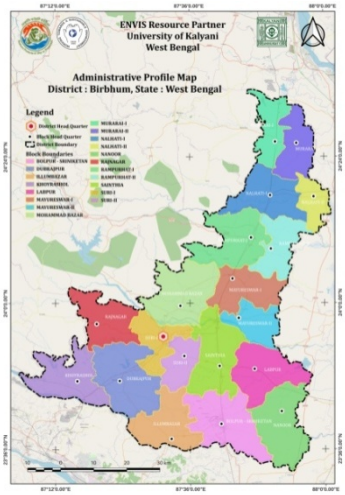
Administrative profile map of Birbhum District

Administrative profile of Hooghly District



Administrative profile of Howrah District

	
Administrative profile of Kolkata District	**University of Kalyani**
	
Administrative profile of Murshidabad District	**Administrative profile of Nadia District**
	
Administrative profile of 24 Pargana (North)	**Administrative profile of 24 Pargana (South)**

	
Administrative profile map of Birbhum (with grid)	**Administrative profile map of Birbhum (with grid)**

More maps: https://drive.google.com/drive/folders/1nGLRYcpyxlXznPa50nZEIHvOIFj2X2xK

15. PFMS (Public Financial Management System)

PFMS /EAT Module trainings: We updated the expenditure through PFMS portal.

16. Implementation of Annual Plan of Activities of the Financial Year (2021-22):

Activity/ Target	Achievements
Centre's proposed activities 2020-21	
Regular activities	
Website development	We have collected the data on thematic area "Environmental Biotechnology" from different sources like, libraries, different journals, reviews, Govt. statistics, application case studies, NGOs, internets and to generate a database and published in website with (descriptive, numeric, pictorial, geospatial, etc.). We have maintained and updated subject-specific database, produce value-added products such as: educational-kits on various themes, photo bank, mobile Apps, case studies, success stories etc. The centre has published four newsletters, two abstract volumes and also published leaflets, awareness posters related to Covis-19, thematic poster on special day, hand out etc. Due to COVID-19 pandemic the centres have organized webinars, online competitions, and special day celebrations such as (Environmental Day and International Ozone Day) through online mode. School awareness programmes were organized in different schools of West Bengal.

Extension & Outreach Programme	Centre has online competitions, special day celebrations such as (Environmental Day, International Ozone Day and Science day) outreach /awareness programme (school and village) through online and offline mode. 1. Online competition on International Biodiversity Day Was organized an online Poster and drawing Competition to celebrate the International Biodiversity Day on 22nd May 2021. More than 400 students (school, colleges and universities) participated in the competitions 2. Awareness programme on International World Ozone Day was celebrated on 15th September 2020 through online Competition (Drawing and Debate). There were 48 school students participated in this programme. 3. Awareness programme on National Science Day was celebrated on 28th February, 2022 through online competitions like Mini science Project/model and Drawing among the school students. More than 60 students participated in the competitions. 4. DESKU ENVIS RP was organized an awareness programme on "**ENVIRONMENTAL BIOTECHNOLOGY**" at Deshpriya high school, Gayeshpur, Nadia on 23rd November 2021. 5. Display of ENVIS Publications in Kalyani Book Fair- DESKU ENVIS RP participated in Kalyani book fair 2021 on 25th November, 2021 for displaying ENVIS activities and publications of the centre in Kalyani University Stall (No-43). 6. School Awareness programme on **Say no to single use plastic** at Gayespur Kishalaya HS School on 10th December 2022. 7. Environmental Awareness programme among 5SSG Groups such as 1. Ranaghat Maa Saradha Mahila Samit 2. Ekta Mahila Samity 3. Disha Aikantik Samity 4. Sruti Mahila Gosthi 5. Samvab Parivar - on 5th January 2022. Total 160 participants were participated in this programme. 8. School Awareness programme on Environmental Biotechnology at Belgharia HS School on 23rd March, 2022

Publications	**Four volumes of Newsletters (ISSN: 0974 2476)** 1. Environmental Sustainability and Ecological Footprint (Vol. 38, Issue No. 1) 2. Resource Recovery from By-products, (Vol. 38, Issue No. 2) 3. Sustainable Management of Plastic Material', (Vol. 39, Issue No. 1) and 4. Green Chemistry and Biodegradable plastics (Vol. - 39, Issue No. 2) **Abstract volume** Two Volume:38 and 39(Abstract of research papers related to the Subject) **Mobile Apps** 1. Biodiversity and Climate Change 2. Urban ecosystem 3. Biosensor **Poster** 1. Poster on Say To use single use plastic 2. Plastic Pollution Day 3. Poster on World Wetland Day **Leaflet/ handout/ brochure** 1. Brochure on Biodiversity day 2. Brochure on World Ozone Day 3. Brochure on World Environmental 4. Brochure on Science Day 5. Leaflet on Bioenergy from Biomass **Articles In newsletter** 1. Roy, j., Samal, A., Maity, J.P., Bhattachary, P., **Mallick, A**., and Santra, S.C. (2022). Distribution of heavy metals in the sediments of Hooghly, Jalangi and Churni river in the regions of Murshidabad and Nadia Districts, India. International Journal of Experimental Research and Review. (Vol 27): 59-68. 2. Samal, A., Bhattachary, P., Maity, J.P., **Mallick, A.,** and Santra, S.C. (2021). Phytoremediation of arsenic contaminated soil and water through some hyperaccumulator pteridophytic plants. The 8th International Congress & Exhibition on Arsenic in the Environment, Wageningen, The Netherlands 07 Jun 2021 - 10 Jun 2021. 3. Article on **Resource Recovery from fish by-products**) In: ENVIS News letter on 'Resource recovery from byproducts'. Vol.-38 (2) (ISSN: 0974 2476). 4. Article: '**Bioplastic from Microorganisms**' In: ENVIS News letter on 'Biodiversity and Current Scenario'. Vol.-39 (2) (ISSN: 0974 2476).

Thematic layers for Grid Mapping	1. Map on Classification of Agricultural productivity of Dakshin Dinajpur District was prepared 2. Map on Classification of population of Dakshnin Dinajpur District was prepared 3. Socio-economic development of Dakshin Dinajpur District 4. Administrative map of Murshidabad District 5. Economic (population distribution) map of Murshidabad District 6. Administrative profile of Murshidabad District 7. Administrative profile of Murshidabad District (with grid) 8. Total male and female population of Murshidabad District 9. Total population of Murshidabad District 10. Land use and land cover of Murshidabad District 11. Administrative profile map of Birbhum District 12. Administrative profile map Birbhumi (with grid) 13. Birbhum land use and land cover 14. Administrative profile of Hooghly District 15. Administrative profile of Hooghly District (with grid) 16. Land use land cover of Hooghly District 17. Potato crop Hooghly District 18. Agricultural crop production (Potato) of Hooghly District 19. Hooghly District micro watershed 20. Economic (population density) of Hooghly District 21. Types of Industry Maps of West Bengal 22. Industrial parks of selected districts of West Bengal 23. Industrial Nodal Agency map of West Bengal 24. Utility services for industrial development map of West Bengal 25. Agro climate zone of West Bengal 26. Socio economic (population density) of Howrah District 27. Administrative profile of Howrah District (with grid) 28. Land use land cover of Howrah District 29. Administrative profile of Howrah District 30. Agricultural crop of Howrah District 31. Agricultural crop (paddy) of Howrah District 32. Flood prone areas of Howrah District 33. Map of Kolkata slum area 34. Administrative profile of Kolkata District 35. Administrative profile of Kolkata District (with grid) 36. Kolkata land use and land cover 37. Kolkata Municipal corporation wards 38. Kolkata land use and land cover (2008 category) 39. Central water commission Kolkata 40. Administrative profile of Nadia District 41. Population density of Nadia District 42. Administrative profile map of Nadia District (with grid) 43. Administrative profile map of Nadia District 44. Land use and land cover of Nadia District 45. Administrative profile of 24 Pargana (North) 46. Land use and land cover of 24 Pargana District (North) 47. Administrative profile of 24 Pargana District (North-with grid) 48. Administrative profile of 24 Pargana (South) 49. Administrative profile of 24 Pargana District 50. Land use and land cover of 24 Pargana District (South) 51. Administrative profile of 24 Pargana District (South-with grid) 52. Administrative profile of 24 Pargana District (South)
Green Skill Development Programme (GSDP)	NA

Theme based Database development (National /State/District/Local) on	✓ Database on plants, bacteria, fungi, algae use for Bioremediation of Water Environment- ✓ Phyto remediation Above theme based data were collected and Compiled.
Video clipping on subject areas for awareness programme	Nill
New initiatives taken during the Financial Year (2021-22):	**<u>Webinar/online competition/awareness/outreach programmes</u>** Due to the COVID-19 pandemic. the DESKU ENVIS Resource Partner on Environmental Biotechnology, University of Kalyani, organized online seminars competitions through Google meet, YouTube channel & Face book page and also organized some offline awareness programmes in different schools and villages. **1. Webinar on World Environmental Day** A webinar on Biologic Drugs and Biosimilars' was organized on the occasion of World Environment Day, 5th June, 2021. **2. Webinar on National Science Day** A webinar on '**Current Environmental Scenario and our Duties**' was organized on the occasion of National Science Day, 28th February, 2022. Dr. Sudipta Modak, Prof (retd) of Chemistry, City College, Kolkata, Chairman, Biodiversity Management Committee Chandernagore Municipal Cooperation, and Member of Biodiversity Management Committee Hooghly Zilla Parishad, delivered a detailed lecture on Current Environmental Scenario and our Duties. **3. Online competition on International Biodiversity Day** On account of the restrictions imposed due to COVID-19 pandemic, the ENVIS RP organized an online Poster and drawing Competition to celebrate the International Biodiversity Day on 22nd May 2021. **4. Online competition on World Ozone Day** On account of the restrictions imposed due to COVID-19 pandemic, the ENVIS RP was only able to organize an online Poster and Debate Competition to celebrate the World Ozone Day on 16th September, 2021. **5.Online competition on National Science Day** DESKU ENVIS RP organized an online Mini science project and drawing Competition to celebrate the National Science Day on 28th February, 2022. 6**.Participation on National Book fair** ENVIS RP participated in Kalyani book fair 2021 on 25th November, 2021 for displaying ENVIS activities and publications of the centre in Kalyani University Stall (No-43). 7. **School awareness programme.** DESKU ENVIS RP organized four outreach awareness programmes in different schools of West Bengal