

**INFORMATION PERTAINING TO DEPARTMENT OF SCIENCE AND
TECHNOLOGY AND WASTE MANAGEMENT FOR PREPARATION OF
ECONOMIC SURVEY 2020-21 OF GOVERNMENT OF GOA**

The Department of Science and Technology and Waste Management (DS&T&WM) was established with the aim to popularize Science and Technology in the State by implementing different activities, programmes, schemes. It also aims at inculcation of scientific temperament in the minds of young students through activities and programmes in the schools, colleges and other educational institutions. To achieve the mandate Science and technology based activities/schemes are implemented by the Department with the help of line departments, educational institutions, NGOs, other Research institutions etc. Further, DS&T&WM is mandated with management and treatment of all types of wastes generated in the State, scientifically.

Sponsored Science and Technology Programmes:

Grant-in-aid was released to appropriate S&T based research projects of applied nature, relevant to the needs of the State. The projects are being implemented through Educational Institutions, Government Departments and deserving NGOs. Preference is given to S&T projects in the fields of energy conservation measures, treatment and disposal of solid waste, agriculture, biodiversity, sustainable management of natural resources, etc. The Department implements its programmes through two major schemes which are notified for providing financial assistance to researchers in Science and Technology and to organize science seminars/workshops/science exhibition etc. and providing financial assistance to travel within India and abroad to attend seminars/workshops etc. In addition, a scheme has been notified to provide grants to students of High Schools and Higher Secondary Schools to visit reputed institutions/seminars / exhibitions in India in which 40% reservation is kept for ST students. The table showing total financial assistance provided under the schemes for 2020-2021 till date is attached as Annexure - I.

Remote Sensing Applications

Department has a State Remote Sensing Centre at Saligao, Bardez, Goa to which grants are provided to develop infrastructure and procure State of the art equipment and data. Under this scheme, various projects related to the State viz, zoning atlas for siting of industries, cropping/plantation pattern for irrigated areas, agricultural pattern areas, land use estimation, etc is being done.

Promotion of Information Systems in Science & Technology

Under this scheme extensive popularization of S&T programmes are undertaken including Astronomy popular science etc. Grant are provided to science Association/GSCST regularly for their activities and common facilities are provided in school / institutions to cover maximum possible areas for promotion of information systems.

Major achievements of different schemes during 2020-21, till date.

1. Financial assistance have been sanctioned to various educational institutions / NGOs in the State such as National Institute of Oceanography, Dona Paula, Goa, National Institute of Malaria, Campal - Panaji, Don Bosco College of Engineering, Fatorda, Padre Conceicao College, Verna, P.E.S. College, Ponda, Goa college of pharmacy, Panaji, Shree Balram Education Society, Canacona, Shree Rayeshwar Institute of Engineering and Information Technology, etc. for organization of science exhibitions/workshops/seminars/science awareness programmes. Also financial grants have been sanctioned to various research institutions and academic institutions, Autonomous bodies, NGOs, University such as Parvatibai Chowgule College, Margao, Don Bosco College of Engineering, Fatorda, P.E.S. College, Ponda, Padre Conceicao College, Verna, St. Joseph Vaz College, Cortalim, Government Polytechnic, Panaji, Goa College of Home Science, Panaji, Government College of Arts, Science and Commerce, Khandola, Government College of Arts, Science and Commerce, Sanquelim etc. for taking up research projects in Science and Technology
2. Annual grants have been released to the Association of Friends' of Astronomy to conduct various annual science popularization and awareness programmes for students and public at the Public Astronomical Observatory (PAO) at Junta House, Panaji and also other branches of PAO in the State.
3. Goa State Innovation Council (GSInC) have been supported with yearly grants for functioning of Secretariat at Don Bosco College of Engineering, Fatorda and to conduct their yearly activities. GSInC have been also supported financially, to take up programmes for school teachers, teaching science subject with the objective to train them in innovation and creativity.
4. Travel grants have been released to faculties from various Colleges, Goa University, BITS, Pilani and other researchers in Science & Technology to travel in India and abroad to attend various conferences for presentation of their posters / research papers.
5. Department has successfully organized a prestigious science event entitled "Manohar Parrikar Vidnyan Mahotsav" 2020 in the month of December, 2020

6. Science event entitled “ Science Film Festival 2020” was successfully organized in January 2020 through Vidnyan Parishad Goa.

Information highlighting the new initiative /measure s/policy/ decision/ achievements/status for setting up waste management facilities and other waste management related activities undertaken by the DS&T&WM through Goa Waste Management Corporation (GWMC) in the State of Goa during the current financial year 2020-2021 till date.

Introduction

The Goa Waste Management Corporation (GWMC) under DS&T&WM is entrusted to look after the overall management of all types of wastes, collection of dry non-biodegradable waste from Village Panchayats, Municipalities, State & Central Government Institutions, Industrial Estates and other organizations for its safe and scientific disposal. The Government of Goa has also mandated the GWMC to prepare a holistic Solid Waste Management Policy for the State. It has set an ambitious goal of achieving Zero-Waste and Zero Landfill philosophy adopted by the State. This, amongst others, envisages a State with high social awareness on waste and public space hygiene at par with the best tourist destinations in the world.

Documentation of Best Practices

The Goa Waste Management Corporation considers safety of its workers is of paramount importance. The Hindustan Waste Treatment Plant designed to scientifically treat solid wastes is monitored from a central control room for the safety of the workers. The engineer on watch as a complete eye contact and the safety is also monitored by a series of cameras. The Hindustan Waste Treatment Plant is also equipped with full fledged safety features including fire fighting system. The key personal are also trained for the safety equipment. The health and hygiene of the employees are given top priority. Similarly all the necessary gadgets such as gloves, Gumboots, Jackets, Helmets are also provided.

It is also ensured that all the GWMC hired waste collecting agencies and contractors, Village Panchayats, Municipal Councils/Corporation and educational institutions provide its field workers with proper uniforms and other necessary protective cum safety gears. However, its implementation is also monitored by the GWMC staff on biweekly basis. In case of any non-compliance the matter is taken very seriously.

The role of Solid Waste Management in context to the protection of the environment

The Saligao Solid Waste Management Facility caters the waste of 27 Village Panchayat. The facility for scientifically treating dry waste is extended to all over the parts of Goa at its Cacora and Verna baling station. The recyclable waste is disposed through recyclers and non-recyclable waste is transported to Cement Factories at Karnataka for Co incineration.

Whereas, the Biodegradable waste after screening is sent to bio digester fermenter tank, where due bio menthanisation, Methane Gas is extracted which is fed into Bio Gensent as fuel to generate electricity. The Facility generates ~ 0.7 MW of electricity daily, which is partly used in the facility and remaining is fed into electricity grid.

The facility helps in reducing releasing methane into the atmosphere is which in turn supports in reducing Green House gases, which otherwise such waste would have been dumped in open which releases gases due to decomposition into the atmosphere.

GWMC is proposing 3 such similar facilities in 3 different zones of Goa for effective waste management. Thus further assist in minimizing Green House Gases.

a) Supply, Installation, Commissioning & maintenance of Sanitary Pad Dispensers and Sanitary Pad Incinerators along with replenishment of Sanitary pad in the dispensers at regular intervals

<p>Supply, Installation, Commissioning & maintenance of Sanitary Pad Dispensers and Sanitary Pad Incinerators along with replenishment of Sanitary pad in the dispensers at regular intervals</p>	<p>The Goa Waste Management Corporation has supplied, installed, commissioned Sanitary Pad Dispensers and Sanitary Pad Incinerators in 35 colleges across Goa along with replenishment of Sanitary pad in the dispensers at regular intervals under the control of Directorate of Higher Education.</p>
<p>Status</p>	<p>Completed</p>

b) Construction of community biotoilets in the State of Goa .

<p>Construction of community biotoilets in the State of Goa .</p>	<p>Community toilets are constructed based on the request of the Directorate of Panchayats to make Goa Open Defecation Free.</p>
<p>Status</p>	<p>Constructed community biotoilets at 514 locations in the state of Goa</p>
<p>Construction of Individual House Hold Latrines in the State of Goa .</p>	<p>Completed 3293 no's of IHHL units to the beneficiaries in the state of Goa</p>
<p>Status</p>	<p>Completed the following no of units in each Taluka</p> <p style="text-align: right;">Salcete Taluka : 820 IHHL units Bicholim : 762 IHHL UNITS</p>

	Bardez Taluka : 700 IHHL units Quepem Taluka : 197 IHHL units Ponda Taluka : 814 IHHL units
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Note : The work is ongoing pertaining to IHHL on remaining sites as per the GWMC work order.

c) Enhancement of Integrated Solid Waste Management Facility from 100 TPD to 250 TPD at Saligao, Bardez Goa.

Title :	Enhancement of Integrated Solid Waste Management Facility from 100 TPD to 250 TPD at Saligao, Bardez Goa.
Its aims and objectives	To treat and dispose Solid waste scientifically as per SWM Rules 2016. Initiated, Augmented the capacity to 150 Tons Per Day(TPD).
Status	1) Works commenced on 29th August 2020 2) Foundation work of Biodigester and Ctech Basin (ETP) has commenced. 3) Excavation for wet waste shed is in progress.

d) Integrated Solid Waste Management Facility at Cacora, Quepem Goa.

Title :	Integrated Solid Waste Management Facility at Cacora, Quepem Goa.
Description of the scheme/ programs/ initiative	Integrated Solid Waste Management Facility at Cacora will cater waste from villages of Sanguem, Dharbandora, Quepem & Canacona Talukas.
Its aims and objectives	To treat and dispose Solid waste scientifically as per SWM Rules 2016.
Status	1) Letter of Award was issued on 19/02/2020 and Concession agreement was executed on 20/02/2020 between GWMC and Concessionaire. 2) Due to COVID 19, Pandemic and consequent lockdown pre-construction work at the site was suspended since the mobilization of men and material to the site was hampered due to the lockdown. However, the site development works such as levelling and providing storm water drains, ground demarcation/marketing for excavation etc. was done. 3) Foundation works of MRSC shed and biodigester have commenced.. 4) Electricity Connection taken. 5) Scrutiny and approval of drawings is being done by Project Management Consultancy (PMC) of GWMC.

e) Integrated Solid Waste Management Facility at Bainguinim , Tiswadi Goa.

Title :	Integrated Solid Waste Management Facility at Bainguinim , Tiswadi Goa.
Description of the scheme/ programs/ initiative	Integrated Solid Waste Management Facility at Cacora will cater waste from the Ponda and Tiswadi Talukas.
Its aims and objectives	To treat and dispose Solid waste scientifically as per SWM Rules 2016.
Status	<p>a) Floated RFQ for the Integrated Solid Waste Management Facility and conducted prebid meeting on 12/10/ 2020.</p> <p>b) Corrigendum-2 issued on 16/11/2020</p> <p>c) Last date of submission of RFQ bids 04/01/2021</p> <p>d) Opening of RFQ bids is on 05/01/2021</p>

f) Common Hazardous Waste Treatment Storage and Disposal Facility

Title :	Common Hazardous Waste Treatment Storage and Disposal Facility
Description of the scheme/ programs/ initiative	Common Hazardous Waste Treatment Storage and Disposal Facility will treat the hazardous waste from the state of Goa .
Its aims and objectives	To treat and dispose Solid waste scientifically as per Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016
Status	<ul style="list-style-type: none"> • The erection of Pre-Engineered Building (PEB) structure of storage shed-1 has been completed • Temporary Laboratory Facility at site completed. • The weighbridge has been completed and erection of PEB structure of storage shed 2 has commenced. • Laying of liners of the 1st SFL has commenced from post monsoons i.e. Nov 2020

g) Common Bio-Medical Waste Treatment Management facility (CBMWTF)

Title :	Common Bio-Medical Waste Treatment Management facility (CBMWTF)
Description of the scheme/ programs/ initiative	Common Bio-Medical Waste Treatment Management facility (CBMWTF) will treat the Biomedical waste from the state of Goa .
Its aims and objectives	To treat and dispose Biomedical waste scientifically as per the Bio-Medical Waste Management. Rules, 2016.
Status	<ul style="list-style-type: none"> • Compound wall is constructed with gate. • Approval for plans granted by GIDC on 23/09/2020 • Material is mobilized for the 1st Phase of the project. • Electricity connection is taken at site. • Excavation works started at site

h) Selection of service provider to design, build and operate E-waste management facility in Goa.

Title :	Selection of service provider to design, build and operate E-waste management facility in Goa.
Description of the scheme/ programs/ initiative	To manage scientifically all E-waste generated in the State of Goa.
Achievements so far	A total 49.57 tons of E-waste is collected till date from the state of Goa, of which 23.1 tons is sent to authorize recycler.

i) Collection segregation and transportation of solid waste from national highways, state highways and other district roads.

Title : Collection Segregation and Transportation of Solid waste from national Highways, State Highways and other district roads	Collection, segregation and transportation of solid waste from national highways, state highways and other district roads from the state of Goa
Aims and objective	To keep the major roads clean and free from road side littering. The work is awarded to Karnataka Commercial and Industrial Corporation (KCIC) for cleaning the road side stretch of south, central and north zones. Transfer stations and also installed along the stretch for segregation of dry waste
Status	A total 770.04 tonnes of dry waste is collected from January 2020 to November 2020.

j) Remediation of Legacy waste dumpsites in the state of Goa.

Title	Remediation of legacy waste dumpsites in the state of Goa
Aims and Objectives	To manage scientifically all the legacy waste dumpsites in the State of Goa.
Status	Completed the remediation activities of legacy waste at below mentioned dumpsites. a) Sonsoddo Legacy Waste Dumpsite - 91267 m ³ b) Campal Legacy Waste Dumpsite – 8838 m ³ c) Mapusa Legacy waste Dumpsite - 32000 m ³ d) Sada Legacy Waste Dumpsite - 160,000 m ³

ANNEXURE-I

NAME OF THE SCHEME: SCHEME FOR PROVIDING GRANT-IN-AID TO CONDUCT SCIENCE SEMINARS, WORKSHOPS, AWARENESS PROGRAMMES, EXHIBITIONS AND PROVIDING FINANCIAL ASSISTANCE TO TEACHING FACULTIES, RESEARCHERS AND SUBJECT SPECIALTY EXPERTS TO PARTICIPATE IN SCIENCE SEMINARS & WORKSHOPS IN INDIA AND ABROAD IN THE FIELD OF SCIENCE & TECHNOLOGY.

Sr. No.	Title of the project	Amount of financial grants provided (amount in Rs.)
1	Organization of Science film festival 2020	25,00,000/-
2	Travel grants to Norman Dias, Assistant Professor, Don Bosco College of engineering to participate in FTC-2019	58,000/-
3	Travel Grants to Niyan Marchon, Padre Conceicao College of Engineering, verna to participate in prestigious IEEE, TENCON	43,525/-
4	Travel grants to Minisha Pereira, ICMR - National Institute of Malaria Research, Panaji to attend Global Vector Control Response Conference, Panaji	1,06,949/-
5	Travel grants to Dr. Lata Gawade, National Institute of Oceanography, Dona paula	56,422/-
6	Travel grants to Dr. Firoz Basesab to present his scientific work at American Geophysical Union Fair Meeting, USA	19,935/-
7	Travel expenses International Conference on "Advances and Scientific Merits in Biodiversity and Ecology at University of Queensland, Brisbane, Australia.	95,418/-
8	Organization of annual Event Science Fiesta 2019	3,87,354/-
9	Organization of annual Event Science Fiesta 2020	3,44,852/-
10	For poster presentation Biological Control of Mosquito Vector of Global Significance using Novel Mosquito Pathogenic Bacteria from the Indian Coast at Netherland	1,03,200/-
11	Conducting 02 days student technical project exhibition "Tech Twister 2019"	70,000/-
12	Organizing State level Science Project Exhibition	1,00,000/-
13	Conducting International Conference on Algae Fungi and plants: Systematics to Applications (AFPSA-2020)"	40,000/-

NAME OF THE SCHEME: SCHEME FOR RESEARCHERS IN FIELD OF SCIENCE AND TECHNOLOGY AND FOR PROJECTS OF STUDENTS AS PART OF ACADEMIC CURRICULUM

Sr. No.	Title of the project	Amount of financial grants provided (amount in Rs.)
1	Project efficiency of Haloalkaliphilic phosphate solubilizing Bacterium as Bio - inoculant for growth of oryza saliva ---in salt effected coastal saline soils.	2,50,000/-
2	Research project Microbial stress in Mangrove Ecosystems of Goa.	2,50,000/-
3	Research project Design Analysis and Fabrication of same & inlet outlet muffler	1,20,000/-
4	Research project entitled Analysis and optimization of Critical Parameters of an Automated Hydraulic Diecasting Machine.	1,11,500/-
5	Design & Development of system for extraction of water from Atmosphere are using Vapour compression Cycle.	32,500/-
6	Project at Experimental and Theoretical Investigation of Solar Still for Water Distillation.	1,25,000/-
7	Project entitled Garbage Management and Monitoring System.	35,000/-
8	Project entitled Parasitoid Load and Microbial Gut-Flora Diversity in Butterfly (Lepidoptera Papilionoidea) Communities from Selected Habitats of Sanquelim.	1,05,000/-
9	Project entitled Coconut Harvesting Robot.	45,000/-
10	Project entitled Design and development of DI-Bird.	1,40,000/-
11	Project entitled Power Management of Hybrid Sources.	15,100/-
12	Project entitled Synthesis, Characterization and Applications of Polyoxometalate based organic-inorganic hybrid compounds.	2,50,000/-
13	Travel expenses targeting Cholinesterase's Virtual Screening of Chemical Libraries for Potential Anto-Alzheimer's Candidate.	89,000/-

14	Project entitled Biological Evaluation, Isolation and Characterisation of Active Components of Moringa.	2,50,000/-
15	Project entitled estimation of Protein and Lipid from Commercially used crabs and Poultry Chicken in Goa	1,02,000/-
16	Project entitled fuzzy VFD controller for lowering consumption of Air Conditioner	37,000/-
17	Project entitled Study on helicteres Isora fibre blended yarn and isora/cotton union fabric	1,35,000/-
18	Project entitled study of Microstructures of the Canacona Granite	25,000/-
19	Project entitled Low Temperature Synthesis and Characterization of Nanosize Metal Chromites as Industrial Catalyst	2,50,000/-
20	Project titled demonstration of a practical solution for removal of monitoring heavy metals ions from drinking water using modified biopolymer.	2,15,000/-
21	Installation of bio-digester at new South Goa District Hospital, Margao	5,40,000/-