

**3.2.2.1. Details of Workshop/Seminar/Conferences including programs conducted on research methodology, intellectual property right (IPR) and entrepreneurship**

<b>Year</b>	<b>Name of the workshop/ seminar/ conference</b>	<b>Focus on/Objectives</b>
2022-2023	Green hydrogen: opportunities in sugar & distillery in dustry	Research & Entrepreneurship
2022-2023	State Level Sugar Conference 2022	Research Methodology
2022-2023	National Technology day: Theme-Integrated approach in science & technology for a sustainable future	Research & Entrepreneurship
2021-2022	Valorizing waste from Sugar & Allied Industries	Research & Entrepreneurship
2021-2022	Overview of Distilleries and Alcoholic Beverage Industry	Research Methodology
2021-2022	Traditional vs Scientific Technologies for Mahua Spirit and Heritage Alcoholic Beverages Production-Optimization, Evaluation and Training (Heritage Wine Policy)	Research & Entrepreneurship
2021-2022	Use of Retro Fitment Kits for Compressed Biogas (CBG)/ Compressed Natural Gas (CNG) for Agricultural tractors	Research Methodology
2021-2022	Environmental Clearance, Compliances, Violations and Uploading of EC on Parivesh Portal	Research Methodology
2021-2022	Opportunities for Sugar/Distillery Industry in Compressed Biogas (CBG) Sector	Research & Entrepreneurship
2021-2022	Oxygen production in Sugar Mill-Way Forward	Research Methodology
2020-2021	To enhance fuel ethanol production by diverting Sugarcane juice/syrup or BH molasses or Sugar	Research & Entrepreneurship
2020-2021	Preparations for ethanol production from BH molasses cane juice/Syrup and Sugar	Research & Entrepreneurship
2020-2021	Online Workshop on M.Sc. (WBAT) Part II Syllabus Restructuring	Research Methodology
2019-2020	2nd International Conference & Exhibition On Sustainability – Innovation & Diversification in Sugar and Allied Industry	Research Methodology
2019-2020	Wildlife Week	Research Methodology
2019-2020	Use of sugarcane juice/syrup, B-heavy molasses and sugar for enhancement of fuel ethanol production and recent advances	Research & Entrepreneurship
2019-2020	World Biofuel Day	Research Methodology
2018-2019	Recent Developments in Environment and Safety in the Sugar and Allied Industry	Research & Entrepreneurship

2018-2019	United States of America work Experience Programme in Wine	Research & Entrepreneurship
2018-2019	Art of Brewing	Research Methodology
2018-2019	Valorizing waste (vWa) from Sugarcane industries via innovations in pretreatment, bio-production and process intensification	Research & Entrepreneurship



## Green Hydrogen : Opportunities in Sugar & Distillery Industry

One-day workshop entitled 'Green hydrogen: opportunities in sugar & distillery industry' was organized by the Department of Alcohol Technology and Biofuels, at Vasantdada Sugar Institute Pune, on December 18, 2022 with the active participation of sugar mills and distilleries from different States across the Country.

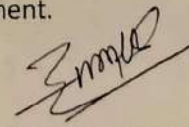
In this workshop Eminent Delegates & Speakers comprising as Mr. Sharad Pawar, Hon. President, VSI, Pune, Member of Parliament (Rajya Sabha); Dr. Chinnakonda S. Gopinath, Scientist-H, CSIR-NCL, Pune; Dr. Bharat Kale, Director General, CMET, Pune; Prof. Rajnish Kumar, IIT, Madras; Prof. VV Mahajani, Adviser to RGSTC, Prof. (Retd.) ICT, Mumbai; Mr. Siddharth R. Mayur, MD, h2e, Pune; Mr. Sambhaji Kadupatil, Director General, VSI; Mr. Shivajirao Deshmukh, Advisor, VSI; Prof. SV Patil, Professor Emeritus, Alcohol Tech & Biofuels, VSI; Dr. KS Konde, Head, Professor & Technical Adviser, Alcohol Tech & Biofuels, VSI were present. Approximately 182 participants from sugar mills and distilleries attended the workshop.

The workshop began with registration of representatives participating from different followed by inauguration. During the inauguration function, welcome address was given by Mr. Sambhaji Kadupatil. He welcomed all the guests, sugar mill representatives and VSI staff. He thanked the president for gracing the event with his presence. He said that the sources of fossil fuels are becoming appallingly scarce day by day and on the other hand, the greenhouse gases which are emitted by combustion of these fossil fuels are causing significant negative effects on our environment such as global warming. He stated that to mitigate these problems, green hydrogen can prove to be a good alternative as it is a clean fuel and has high energy

density. He also elaborated about 'National Green Hydrogen Mission' and 'National Green Hydrogen Policy' launched by the Government of India. Lastly, he expressed his expectations from the workshop to find sustainable solutions towards the vistas of hydrogen technology.

Hon. President of VSI, Mr. Sharad Pawar delivered the key note address. He briefed us about the existing and projected demand of hydrogen in India and globally. He further said that green hydrogen can be considered as the potential catalyst of the world's shift to sustainable energy and net zero emissions to tackle global warming and climate change. He advised sugar industry to explore the option of producing hydrogen in order to diversify their product portfolio. He said production of hydrogen in sugar complex will provide a win-win opportunity to industry & society. Hon. President informed the participants that this workshop organized by VSI is intended to facilitate deliberations on various challenges and exchange of knowledge to pave our path to future. Various issues related to storage, transportation, long term govt. policies, etc. should be addressed in this workshop. Hon. President said, he is sure that the discussions in this workshop will be very fruitful and will definitely lay-down path for sugar industry to venture in this emerging field of green hydrogen.

During the technical session-I, Dr. CS Gopinath gave a presentation on 'Green Hydrogen Economy - India's Ambitions'. He briefly discussed the India's ambitious climate action plan and their set targets. He said that the opportunities lie across hydrogen value chain. His talk was mainly focused on basic concepts of green hydrogen and current technology and R & D development.







Dr. Bharat Kale delivered presentation on the topic entitled 'Hydrogen: Overview of Photocatalytic Process'. Dr. Kale briefed overview of available facilities & ongoing projects at CMET, Pune. In his talk, he emphasized mainly on nanocatalysts and their application for hydrogen production. He also explained about nanocomposites and their applications.

Prof. Rajnish Kumar gave presentation on the topic entitled 'Challenges & Opportunities in CCUS'. He explained different techniques for CO<sub>2</sub> capture, and its sequestration. He mentioned regarding the techno-economic assessment of CO<sub>2</sub> capture, and its sequestration (30 -50 USD/tonne). He also explained method for CO<sub>2</sub> capture where hydrogen is converted to hydrates. He emphasized that the CO<sub>2</sub> capture methods are sustainable, however, industries have to invest huge amount for the same.

In the technical session-II, **Dr. KS Konde**, gave lecture on 'Hydrogen production opportunities in sugar & allied industry'. He discussed various possible routes of green hydrogen production in sugar complex i.e.

electrolysis using cogen electricity, biogas to hydrogen via steam methane reforming and via biogas gasification. He also explained the economics and production cost of all three routes.

Dr. VV Mahajani delivered talk on 'Hydrogen Production from Methane and Bagasse'. He elaborated on the process used for Hydrogen and explained in detail about the process of Steam Methane Reforming (SMR), Partial oxidation technique and Biomass gasification.

Mr. Siddharth Mayur talked on 'Future of energy- Green Hydrogen'. He explained different techniques for electrolysis, and different types of electrolyzers used for it. He elaborated on the new approach for sugar complex where, green hydrogen, ammonia and sustainable aviation fuel (SAF) can be produced in sugar factory. He also explained about his company h2e power and about India's first ever green hydrogen pilot plant commissioned at Jorhat.

The programme was concluded with discussion and vote of thanks which was given by Prof. SV Patil.



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## State Level Sugar Conference 2022

### INAUGURAL FUNCTION

Vasantdada Sugar Institute (VSI), Pune, Commissionerate of Sugar, Government of Maharashtra, Maharashtra *Rajya Sahakari Sakhar Karkhana Sangh Ltd.*, Mumbai, and West Indian Sugar Mills Association jointly organized a two days' state level 'Sugar Conference – 2022' on June 4 & 5, 2022 at VSI as guided by VSI's President Hon. Shri Sharadchandraji Pawar. The objective of this conference was to deliberate on the burning issues confronting the sugar and allied industry as also to brainstorm on their possible solutions. The conference was attended by around 2500 persons from the sugar industry including management & technical staff from cooperative & private sugar mills, distilleries, technology suppliers, staff from sugar Commissionerate, state federation of cooperative sugar factories etc.

The inaugural session began with the lighting of the lamp by the dignitaries on the dais which included the chief guest Shri Nitin Gadkari, Hon. Minister for Road Transport, Highways & Shipping, Government of India; VSI President Hon Shri Shardchandraji Pawar; Shri Ajit Pawar, Deputy Chief Minister of Maharashtra; Shri. Dilip Walse-Patil, Home Minister; Shri Rajesh Tope, Minister for Health; Shri Balasaheb Patil, Minister for Cooperation & Marketing; Shri Shambhuraj Desai, Minister of State, Home (Rural); Shri Vishwajeet Kadam, Minister of State, Coop & Agri; Shri Rajendra Patil Yadavkar, Minister of State, Public Health & Family Welfare; Shri Satej Patil, Minister of State, Home (Urban); Shri Shriniwas Patil, MP; Shri Hemant Patil, MP, Shri Vijaysinh Mohite-Patil former Deputy CM Maharashtra, Shri Jaiprakash Dandegaokar, Chairman, National Federation of Cooperative Sugar Factories, New Delhi. Shri Jaiprakash Dandegaonkar welcomed the chief guest Shri Nitin Gadkari and Shri Sharandchandraji Pawar with a bouquet of flowers. He also welcomed the participants to the conference and gave the background for organizing the event. This was followed by the release of two publications at the hands of the chief guest. These

included 'Adharstambh' the contribution of Hon. Padmavibhushan Shri Sharadchandra Pawar to the Sugar Industry and State Level Sugar Conference- 2022 containing articles of speakers from the conference, sugar mills and VSI scientists.

Shri Balasaheb Patil delivered the opening address where he gave the details about the record breaking current crushing season which had to be extended owing to the bumper harvest of sugarcane.

This was followed by the presidential address of Shri Sharadchandraji Pawar in which he gave a detailed analysis of the current scenario in the Indian sugar industry covering sugar exports, cogeneration, fuel ethanol production, environment, computerization, cost of production and various facets of agriculture. He also took a review of the sugarcane production in the state. He concluded with the highlights of VSI's works and its contribution to the sugar industry since its establishment in 1975.

Shri Nitin Gadkari in his address talked about the various developments in the ethanol sector and the role of the Central Government in promoting biofuels and alternative fuels. He began his speech with the dream for a self-reliant India which was a 5 trillion dollar economy but which was impossible without agricultural and rural development. The sugar industry is deeply connected with this and there are 188 loksabha constituencies with heavy influence of sugarcane farmers in the country. He discussed about the 3Fs i.e. Food, Fuel & Fertilizers and how their need could be met from the sugar industry. He mentioned about the rapid growth of the automobile industry in the country as also the highways which have reduced travel times between important destinations. All this would increase the demand for fuel and alternative fuels like ethanol, methanol, biodiesel, bio CNG, bio LNGgreen hydrogen etc. would be significant which are also connected to the sugar industry. He talked in great detail about fuel ethanol, electric vehicles and the how the government was promoting these. He stressed upon the importance of water conservation

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especially in rural areas. Shri Gadkari also appreciated the work of VSI under the visionary guidance of Hon. Shri Pawar. He ended by asking the Director General Shri Shivajirao Deshmukh to focus VSI's work on waste to wealth and knowledge to wealth especially for the agriculture sector.

The conference was inaugurated by the Hon. Chief Minister of Maharashtra Shri Uddhav Thackeray who had joined the session online. In his virtual inaugural address he talked about the various problems faced by the sugar mills in the state especially the issue of cane harvesting. He said that market research surveys like in Brazil were essential based on which crops should be chosen. Adopting appropriate technology

was necessary in these challenging times. He stressed upon the importance of ethanol in the future. He also informed about the problems of sugarcane harvesting labour and the formation of Gopinath Oostod Kamgar Mahamandal to resolve their problem. He ended his address by appreciating the role of VSI and VSI President Shri Sharadchandraji Pawar in addressing all important issues before the industry through this conference.

The session was coordinated by **Dr. Deepali Nimbalkar.**

After the session Shri Nitin Gadakari visited exhibition area along with Shri Shivajirao Deshmukh, DG, VSI.







## Session-I : Problems and Remedies of Sugar Industry

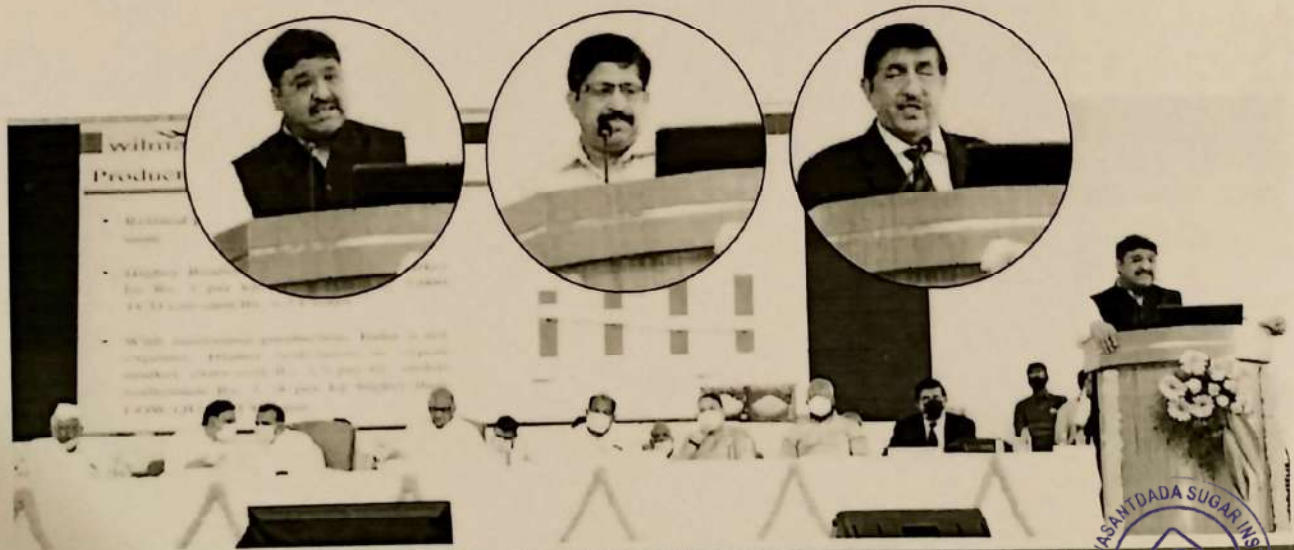
The session was chaired by Mr. Balasaheb Patil, Hon'ble Minister Co-operation and Marketing, Maharashtra State. The experts for this session were Mr. Balasaheb Thorat, Hon. Minister of Revenue, MS; Mr. Babandada Shinde, MLA, Chief, Vitthalrao Shide SSK Ltd.; Mr. Vishal Patil, Trustee, VSI; Mr. PA Raut, Shrinath Maskoba Sugar Pvt., Ltd. The speakers of this session were Mr. Ravi Gupta, Director, Shree Renuka Sugars Ltd. Mr. Shekhar Gaikwad, Sugar Commissioner, Maharashtra State Mr. Prakash Naiknavare, Managing Director, National Sugar Federation

Dr. RV Dani, VSI welcomed all the delegates and introduced all the experts and speakers of the session. In this session, Mr. Ravi Gupta spoke on the topic '**Improving source of revenue for sugar co-operatives in Maharashtra**'. He highlighted about market oriented measures for increase in profit margin of sugar industry. He explained the benefits achieved by the Indian sugar industry due to diversion of different feed stock for ethanol production and sugar export. He also showed the importance of producing CBG using press mud cake and bagasse to improve profitability of sugar & allied industries.

Mr. Shekhar Gaikwad spoke on the topic '**Administrative improvement for sugar industry in Maharashtra**'. He explained about sugar season 2021-22, there is 13.67 lakh hectare under sugar cane

cultivation. During this season 199 sugar mills in the state are in operations which have crushed 1317.22 Lakh MT sugarcane and he highlighted on the administrative measures taken such as issue of Online crushing license to sugar mills after confirming 100 % FRP payment to the sugarcane farmers, grading of sugar mills based on FRP paid by the Department of Sugar Commissioner for improvement of sugar mills in Maharashtra. He encouraged sugar mills producing various by-products and development of new value added products in addition to sugar production so as to make industry sustainable.

Mr. Prakash Naiknavare discussed on the topic '**Expectation of sugar industry from State and Central Government**'. He told that first time in the history of Indian sugar industry the farmer, owner of the sugar mill/ management of the co-operative sugar mills & consumer of the sugar in the country are happy due to increase in the prices of the ethanol and higher export of the sugar. He explained about the necessary support from central as well as state government to the sugar industries to resolve some issue such as income tax as well as the policy formulated in 2019 regarding 'Aadhunik Proctsahan Yojana' in which co-operative sugar mills are excluded. The session was coordinated and concluded with vote of thanks by Dr. RV Dani.







## Session-II : Future Prospectus Innovative Research, Technology and Applications-Its Vision and Implementation in Sugar and Allied Industries

The session was chaired by Dr. AK Vidyarthi, Director & Scientist-F, CPCB, Delhi. Experts for this session were Mr. Vijaysinh Mohite-Patil, Ex-Deputy Chief Minister, Govt. of Maharashtra; Advocate Ashok Pawar (MLA), Chairman, Raosahebada Pawar Ghodganga SSK Ltd.; Mr. Mansingrao Naik (MLA), Chairman, Vishwasrao Naik SSK Ltd.; Mr. Narendra Ghule-Patil, Chairman, Loknete Marutrao Ghule-Patil Dnyaneshwar SSK Ltd.; Mr. Arvind Gore, Chairman, Dr. Babasaheb Ambedkar SSK Ltd., and Mr. Bipin Kolhe, Chairman, Sahakar Maharshi Shankarrao Kolhe SSK Ltd. The speakers for this session were Dr. SV Patil, Professor, Emeritus, VSI; Mr. SD Bokhare, Executive Director, Bhaurao Chavan SSK Ltd. and Prof. GD Yadav, Ex-Vice Chancellor, ICT, Mumbai.

In this session, **Dr. SV Patil** presented on the topic '**Beyond Ethanol: Bio-circular economy and bio-refining for sustainability for sugar industry**'. He emphasized on valorization of sugar industry waste for production of bio-CNG, 2G ethanol, biobutanol, green hydrogen, aviation fuel, lactic acid, succinic acid, gluconic acid xylitol and potash fertilizer etc. through bio-refining and bio-circular economy. He also discussed about the current scenario of ethanol blending in country.

Mr. SD Bokhare talked on the topic '**Future technological innovations in sugar industry**'. He focused on future technological innovations with its

importance in sugar industry which included utilization of sugarcane biomass for conversion in to CNG, LNG, 2G ethanol, chemicals, pellets and power, etc. He suggested adapting flex vehicles which can be operate using fuel ethanol. He also explained the latest technology of drone which can be used for fertilisers, ripeners, pesticides & mineral sprinkling which save time and manpower requirement.

Prof. GD Yadav talked on the topic '**Green hydrogen-new opportunities for sugar sector**'. He emphasized on the effect of biomass burning, water intensive crops and their impact on climate change and global warming. He conceptualized transformations of Indian sugar industry through biorefinery approach to create zero-waste society with net-(carbon)-zero economy from biomass sources through the options like reduce, reuse, recycle, recovery and land filling. He specified on green ammonia and green H<sub>2</sub> production with its impact on environment.

In concluding remarks, Dr. AK Vidyarthi, the session chairman explained the issues linked to sugar & allied industries and their possible solutions. He discussed several problems related to environment, technology, resource, administration, infrastructure, manpower, lack of association and financial crisis in Indian industrial sector.

The session was coordinated by Dr. KS Konde, VSI and session concluded with vote of thanks.



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## Agriculture Session-III : Breeding of Sugarcane Varieties, Seed Replacement, Multiplication and Production Technology

The session was chaired by Mr. Harshvardhan Patil, Hon. Ex-Minister of Cooperation and Chairman, Nira-Bhima SSK Ltd. The experts for this session were Mr. Arun Lad, MLA & Chairman, Kranti Agrani Dr. GD Bapu Lad SSK Ltd., Mr. PR Patil, Chairman, Rajaram Bapu SSK Ltd., and Mr. Purushottam Jagtap, Chairman, Shri. Someshwar SSK Ltd., The speakers for this session were Dr. RS Hapase, Head & Principal Scientist, Plant Breeding, VSI Dr. BS Raskar, Sugarcane Specialist, Central Sugarcane Research Station, Padegaon and Mr. SS Katake, Scientist and Farm Manager, VSI

The session coordinator Mrs. Sudha Ghodake, VSI welcomed all the delegates and introduced all the speakers of the session. In this session, the first presentation on '**Importance of planting planning of sugarcane varieties for higher cane yield and sugar recovery**' was given by Dr. RS Hapase. He highlighted the role of Sugarcane Breeding Institute, Coimbatore in development of new sugarcane varieties like Co 86032. VSI has established its own Sugarcane Breeding Center at Amboli in Sindhudurg Dist. in 2006 with an objective to develop the sugarcane varieties suitable for different agro climatic regions of the Maharashtra State. He enumerated that the variety VSI 08005 (VSI 12121) developed from SBC, Amboli has occupied about 80 % area in the North-East zone of the Maharashtra State.

The second presentation on '**Sugarcane varieties developed by the Central Sugarcane Research Station, Padegaon**' was given by Dr. BS Raskar. He

emphasized on the new sugarcane varieties developed by them like MS 10001, CoM 09057, CoM 11082 and PDN 15012 and these varieties are serving for increasing the cane yield and sugar recovery of the Maharashtra State.

The third presentation on '**Sugarcane seed multiplication and production technology**' was given by Mr. SS Katake. He pointed out that the seed multiplication ratio of the Maharashtra state is very low i.e. only 6% and it needs to be increased by 25 to 30%. He stated that the sugar mills are not willing to supply quality seed to cane growers, most of mills do not have their own seed nursery for further multiplication of breeder seeds and they have to produce foundation seed at progressive farmer's field having assured water pockets as per the requirement of sugar mills. He also highlighted the important role played by VSI in production of breeder's seed and its timely supply.

The Chairman concluded that the research organizations like VSI and Mahatma Phule Krishi Vidyapeeth, Rahuri in collaboration with Sugar Commissionerate should prepare the draft on '**Changing sugarcane varieties and seed with available technologies**' for increasing cane yield and sugar recovery. He also stated that, Sugar Commissionerate should monitor strictly the programme for its implementation by the sugar mills in Maharashtra State.

The session was concluded with the vote of thanks.







## Technology Session-III : Administrative and Financial Management and Sustainable Sources of Income Generation

Chairman of this session was Mr. Vidhyadhar Anaskar, Administrative, Maharashtra State Co-op. Bank Ltd. Mumbai and experts were Mr. PG Medhe, Honorary Expert Advisor, Chhatrapati Rajaram SSK Ltd., Mr. Manohar Joshi, Managing Director, Jawahar SSK Ltd., and Mr. Jitendra Ranavare, Managing Director, Vikasratna Vilasrao Deshmukh Manjra SSK Ltd.

The speakers were Mr. BB Thombare, President, WISMA & Chairman & Managing Director, Natural Sugar Mill Ltd.; Mr. RD Mahuli, Managing Director, Rajarambapu Patil SSK Ltd.; Dr. YS Kulkarni, Managing Director, Shri Pandurang SSK Ltd., and Mr. Vidhyadhar Anaskar, Administrator, Maharashtra State Co-op. Bank Ltd. Mumbai Mr. SR Khengare, VSI was coordinator for this session.

Mr. SR Khengare welcomed and introduced Chairman, experts and speakers of this session. Also he briefed about the importance of this subject to sugar industry.

The session begins with the presentation of Mr. BB Thombare on subject '**Beyond Sugar**'. He emphasized mainly on production of ethanol, Bio-CNG and hydrogen which can give economic stability to sugar industry in future.

Mr. RD Mahuli, made presentation on '**Sustainable sources of income for sugar factory**'. He explained that during crushing season 2021-22, around 3.80 million tonnes of sugar from state as well as country was diverted

to syrup to ethanol route in response to central government's ethanol blending programme. Moreover, due to drought in Brazil this helped to increase the sugar export from India. He pointed out that keeping in view central government's 20% ethanol blending programme up to 2025 there is urgent need to divert some portion of sugar to ethanol to add as sustainable source of income.

Dr. YS Kulkarni made his presentation on '**Cost cutting and remedial measures in the sugar industry**'. He explained that there is wide variation in cost of production of sugar of each sugar mill. He emphasized that cost cutting in variable as well as fixed cost parameters will be additional source of income.

Mr. Vidhyadhar Anaskar, talked on '**Sugar Factories: Financial discipline and management**'. He told that before preparing any loan proposal, the management of sugar factory should take information of various lending schemes of nationalized banks and Financial Institutions and study the these schemes in regards to minimal rate of interest, moratorium period and repayment schedules. There is urgent need to stop cash transactions completely. The sugar mill should keep in mind that the provision of 1/3<sup>rd</sup> amount out of the total income should be made available and accordingly decide type of loan i.e. short term, medium and long term loan.

The session concluded with vote of thanks by Mr. SR Khengare.



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## Agriculture Session-IV : Soil Fertility Management & Use of Advanced Technology

This session was chaired by Dr. AS Dhavan, Former Vice Chancellor, Vasantnaik Marathawada Agriculture University, Parbhani and experts were Mr. Prakash Awade, MLA, Chairman, Jawahar Shetkari SSK Ltd.; Mr. Shriram Shete, Chairman, Kadwa SSK, Ltd.; Mr. Shankraro Sawant, Chairman, Dwarkadish SSK Ltd.; Mr. Balasaheb Taware Patil, Chairman, Malaegaon SSK, Ltd.; Dr. AL Pharande, Former Dean of Agriculture and Director of Education MPKV, Rahuri; and Mr. Vikas Patil, Director of Agriculture Extension and Training, Commissionerate of Agriculture, Maharashtra State Pune.

The speakers for this session were Dr. BB Kale, Director General, CMET Pune; Dr. BD Bhakre, HOD, Department of Soil Science and Agril. Chemistry, MPKV, Rahuri; Udyan Pandit Shri. Ganpatrao Patil, Chairman Datta Shetkari SSK. Ltd.; and Dr. AM Navale, HOD, Department of Plant Pathology and Agriculture Microbiology, MPKV, Rahuri.

Dr. Preeti Deshmukh, VSI, was coordinator for this session. She welcomed chairman, panelist, speakers and all the participants.

Dr. BB Kale delivered the speech on 'Use electronic materials in agriculture'. He explained degradation of spentwash powder is possible by electronic material. He also explained about nutrient sensor and its use in agriculture.

Dr. BD Bhakare, HOD delivered the lecture on 'Management of salt affected soil'. He explained about characterization of saline, sodic and saline sodic

soil. He warned that area under salinity and sodicity is increasing day by day and it disturbs the soil physical condition, destroys beneficial micro flora and fauna and nutrient availability and their uptake. Udyanpandit, Mr. Ganpatrao Patil explained the success story of reclamation of saline sodic soil at sugar mill site. He highlighted that subsurface drainage is beneficial for reclamation of saline sodic soil. He succeeded the soil reclamation programme on large area by holding the farmers meetings and emphasizing the farmers regarding the importance of reclamation. He appealed that approximately 8000 ha area reclaimed till now and work is going on approximately 2000 ha area by the sugar mill in cooperation with farmer.

Dr. AM Navale presented the topic on 'Use of Beneficial Microorganisms in Sugarcane'. He briefed that there are many types of micro-organisms in the soil and these microorganisms' helps to increase the nutrient availability to sugarcane crop as well sustain the soil fertility. He warned that is needed to create awareness in the farmers regarding use of biofertilizer.

Dr. AS Dhavan, chairman of the session given his concluding remarks. He suggested that salt affected soil is a burning issue in this era and appreciated the reclamation work done by Datta SSK and suggested all officers to visit Datta SSK for monitoring the work of reclamation. The programme was concluded with vote of thanks.







## Technical Session-IV : Challenges and Futuristic Approach in Technology

This session was chaired by Mr. Rajesh Tope Hon'ble Minister of Health, Government of Maharashtra and Mr. Sameer Dhodake, General Manager (MEDA) as an expert of this session.

Dr. RV Dani, Technical Adviser & Head, Department of Sugar Technology, VSI; Mr. RA Chandgude, Technical Adviser & Head, Department of Sugar Engineering, VSI; Dr. KS Konde, Professor, Technical Adviser & Head, Department of Alcohol Technology and Biofuels, VSI and Dr. Deepali Nimbalkar, Senior Scientist & Head, Environment Sciences VSI, as speakers for this technical session.

Mr. DN Shitole, VSI coordinator for this session, welcomed all chairman, speakers, various officers from cooperative & private sugar mills and distilleries and participants.

In this session Dr. RV Dani addressed on 'Challenge and futuristic approach in sugar processing'. It was explained on the diversion of syrup & B-heavy molasses as feedstock for ethanol highlighting the major issues of evaporator and vapour load on the condenser. He advised that the sugar laboratory should be equipped with modern equipment for analysis.

Mr. RA Chandgude has presented on 'Sustainability through innovative and viable technologies in sugar industry' and highlighted the adoption of modern technology in sugar mills. In juice extraction system, it is advised to install mills with GRPF, TRPF, two roller mills, and diffuser technology for increasing the extraction and saving of power.

Dr. KS Konde, spoke on 'Critical investigation of sugar juice/syrup to ethanol production'. He elaborated ethanol production on the syrup route, and insisted for systematic design of plant and machinery to attain an optimum capacity utilization of the fermentation and distillation section of the distillery. Also, enlightened the techno-economical route for disposal of spent wash through incineration boilers and spent wash drying technology.

Dr. Deepali Nimbalkar talked on 'Changing environmental norms and its Implication on future development in sugar and allied industry'. She highlighted the stringent norms stipulated by MPCB and CPCB and advised sugar and distillery projects to adhere to them for a better environment. She emphasized on reduction of raw water consumption for processing of feedstock to production of RS, ENA and Ethanol. Highlighted the use of CO<sub>2</sub> released during the fermentation process in distillery and considering the utilization of the gas for defecation process in sugar cane juice processing in clarification thus, reducing the emission of CO<sub>2</sub> into the atmosphere.

After technical presentations, chairman of the session expressed his views on the topics presented, stressing the adaptation of new technologies to reduce the steam, water and power consumption during the processing of sugar cane juice for production of plantation white crystal sugar and ethanol. The session concluded with vote of thanks.







## Agriculture Session-V : Mechanization and Advanced Irrigation System in Sugarcane

Mr. Rajendra Patil-Yadavkar, Hon'ble State Minister, Public Health Department, Maharashtra State was Chairman and Mr. Dilip Zende, Director, Quality Control, Commissionerate of Agriculture, MS was an expert and the speakers were Mr. Sanjay Khatal, Managing Director, Maharashtra State Co-operative Sugar Factories Federation Ltd., Mumbai; Mr. PP Shinde, Scientist and Head, Agriculture Engineering Section, VSI and Mr. Subhash Jamdade, Vice President, Rajarambapu Patil Oversees Business Ltd.

The session Coordinator Mr. PP Shinde, VSI welcomed all the delegates. In this session Mr. Sanjay Khatal talked on '**Sugarcane Harvesting through Harvester and their Problems In India**' briefed about companies doing production of sugarcane harvesters but M/S. Case New Holland Industrial India Pvt. Ltd. and M/S. Shaktiman Tirth Agro Technology Pvt. Ltd. Gujrat have higher manufacturing capacity. The total fifty percent harvesters are sold in Maharashtra only, followed by Karnataka. The cost of sugarcane harvester is higher due to less demand of the machines. He also pointed that, In Brazil, 92 percent sugarcane is harvested by harvester and clean with help of dry cleaning system hence productivity and recovery are better.

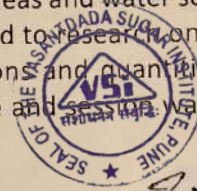
Mr. PP Shinde presented talk on '**Advanced technologies of micro-irrigation system in sugarcane**'. He briefed about micro-irrigation technology its impact on more sugarcane production in lesser water quantity. He emphasizes drip irrigation saves 45 to 50 % water,

40% fertilizers, and increases 30 to 35% sugarcane yield as compared to conventional irrigation. Rain sprinkler irrigation increases the sugarcane yield by 15 to 20% and saves the water by 30 to 35%. He stressed on a separate wing in sugar factories is needed for implementation of drip irrigation schemes.

Mr. Subhash Jamdade talked on '**Use of drone in sugarcane agriculture**'. He, Briefed about a drone technology is a promising source of precision farming. Spraying of agro inputs as bio stimulants, water soluble fertilizer, insecticides, pesticides sugarcane is possible. With the help of drone it is possible to spray 1 acre area in 10 lit. of water within 8 to 10 min. The pilot of drone should be well trained. The cost of drone spraying is 500-700 Rs. Per acre

After presentation, expert Mr. Dilip Zende pointed out that Government has given subsidy to farmers who installed ISI mark drip irrigation system. In last year large number of farmers applied for subsidies hence allotments of subsidy is in progress.

Mr. Rajendra Patil-Yadavkar in his concluding remarks suggested that, there is a need to study on materials of blades of sugarcane harvester and its cutting angles and drone operator should take care of well; animal shelters; living areas and water sources while spraying. There is a need to research on spraying of inputs, its concentrations and quantities of water required through drone and session was concluded with vote of thanks.



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## Technical Session-V : Ethanol Production : Futuristic Perspective

This session was chaired by Mr. Promod Chaudhary, Chairman, Praj Industries Ltd., Experts for this session were Mr. Ashutosh Kale (MLA), Chairman, Karmaveer Shankarrao Kale SSK Ltd.; Dr. Indrajeet Mohite, Trustee, VSI; Mr. Kantilal Umap, Commissioner, State Excise Department, Maharashtra; Dr. Sanjay Bhosle, Assistant Director, Co-product, Dept. of Sugar Commissioner, Maharashtra; Dr. Ketki Bapat, Scientist, PSA to Govt. of India, Delhi. The speakers for this session were Mr. CN Deshpande, President, Jaywant Sugars Ltd.; Mr. DM Raskar, CEO, Shrinath Maskoba Sugar Factory Ltd., and Mr. Ghansham Deshpande, President-Technology & Engineering, Praj Industries Ltd.

**Mr. DA Patil**, VSI coordinator welcomed all delegates and introduced all the speakers of the session. In this session, Mr. CN Deshpande presented on the topic 'Additional ways to propel ethanol production'. He shared his experience on cane bio syrup manufacturing and its utilization for ethanol production. He focused on its processing and storage.

Mr. DM Raskar talked on the topic 'Compressed biogas (CBG) - sustainable fuel potential'. He explained the importance of CBG production. He briefly explained

the industrial processes of biogas production and its purification.

Mr. Ghansham Deshpande talked on the topic 'Advanced bio-fuels and chemicals (other than fuel ethanol) from bio-mass'. He explained the possibility of different fuels and chemicals through biorefinery concept. He explained about the advanced biofuel such as 2G ethanol, CBG, sustainable aviation fuel, green hydrogen, polylactic acid (PLA), polyhydroxyalkanoate (PHA), iso-butanol, solid, liquid fertilizer, CO<sub>2</sub> and some high value chemicals.

Mr. Pramod Chaudhary, the session Chairman in his concluded remarks suggested that sugar industry should divert other value added product like CBG, green hydrogen, aviation fuel, solar energy, iso-butanol, polylactic acid, liquid fertilizer etc. He also suggested that sugarcane & BH-molasses will not be sufficient to produce 1200 crore liters of fuel ethanol in 2025. Therefore, it is essential to produce balance fuel ethanol from grains. He appreciated VSI for organizing such type of conference which will be fruitful to all sugar and allied industries.

The session was concluded with vote of thanks by **Mr. DA Patil**.



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राज्यस्तरीय साखर पारंपद-२०२२  
दिनांक : ४ व ५ जून २०२२







## VALEDICTORY SESSION

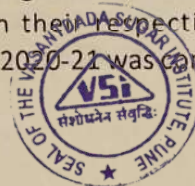
Vasantdada Sugar Institute (VSI) has organized two days State Level Sugar Conference on June 4 & 5, 2022 at VSI premises. On successful completion of the two days sessions, a valedictory session was chaired by Mr. Dilip Walse-Patil, Hon. Minister of Home Affairs, Government of Maharashtra and Vice President of VSI. Other dignitaries who were present on the dais and were honoured for this session are Shri. *Sharad Pawar* Hon'ble President, VSI, Mr. Balasaheb Patil, Minister of Co-operation & Marketing; Mr. Rajesh Tope, Minister of Public Health & Family Welfare, Mr. Jayprakash Dandegaonkar, President, National Federation of Cooperative Sugar Factories Ltd, New Delhi, Mr. Vijaysinh *Mohite*-Patil, Former Deputy Chief Minister, Government of Maharashtra, Mr. Harshavardhan Patil, Former cooperative minister, Government of Maharashtra and Mr. Narendra Murkumbi, Director, M/s. Ravindra Energy was honoured as Chief Guest for the valedictory session.

Mr. Nrdendra Murkumbi, addressed the delegates and summarised about two days activities. He emphasized on new business opportunities to be adopted in sugar mills, which are technically and economically viable. Also, elaborated the global sugar scenario i.e. sugar production, sugar stock & export potential to the other countries. Further, the sugar rates were increased due to higher crude oil

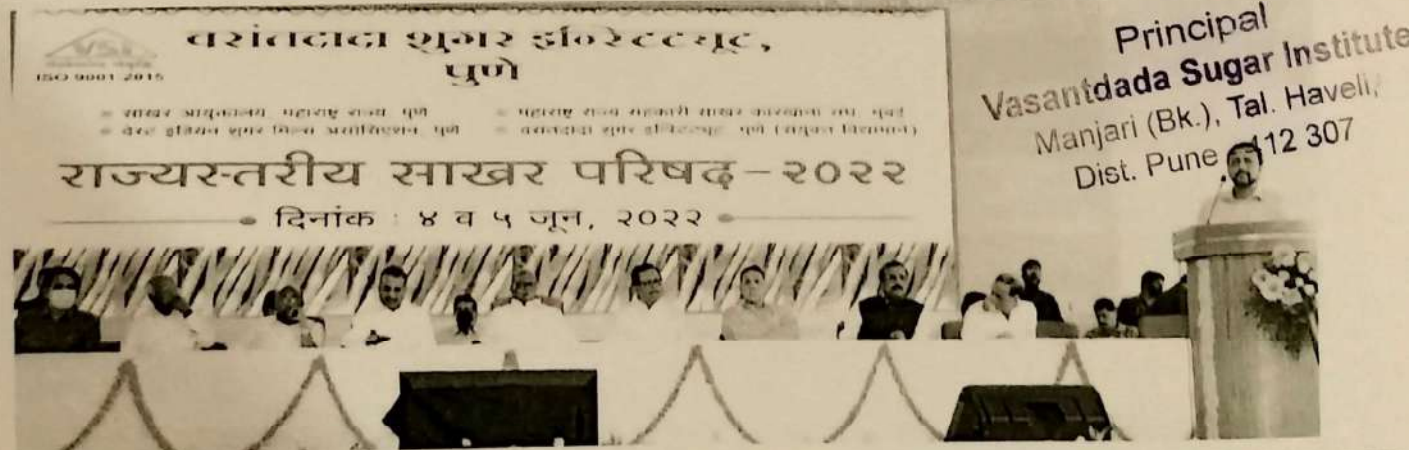
prices at USD 120 /barrel because of the ongoing Russia –Ukraine war. Enlighten the need for Flexible engines in vehicles to operate on multi-fuel also future ethanol demand for vehicles will enhance due to the upcoming production of automobiles. Explaining on the Agriculture front, the effect of Climatic changes and the necessity of Generic modification in agriculture. In India, Generic modification in agriculture is almost stopped. Need to encourage for Generic modification in India is very much required.

Mr. Dilip Walse-Patil, expressed his views regarding cane development, cane yield & recovery improvement. During the session, discussion explained the cane development programme being implemented at Bhima Shankar SSK Ltd., and improve cane yield from 66 to 130 tonne/h. He also highlighted various important aspects of the overall development of the sugar industry by the expert speakers during the session. He thanked to all dignitaries on the dais, farmers, sugar mill directors, various expert speakers, officers of sugar mills and VSI personnel.

The session was concluded by vote of thanks and followed by the VSI's Annual Award Function of prize distribution ceremony to the outstanding performers of sugarcane growers, official at sugar mills and distilleries in their respective fields for the year 2019-20 and 2020-21 was commenced.




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**वसंतदादा शुगर इंस्टीट्यूट,  
पुणे**  
 १९६१-२०१३  
 = साखर भावुकतालय, महाबलेश्वर, राज्य, पुणे      = महाबलेश्वर राज्य, महाबलेश्वरी साखर कारखान्याचा राज्य, पुणे  
 = वेस्ट इंडियन शुगर मिलिंग असोसिएशन, पुणे      = वसंतदादा शुगर इंस्टीट्यूट, पुणे (साखरका विद्यालय)

## राज्यस्तरीय साखर परिषद-२०२२

दिनांक ४ व ५ जून, २०२२



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## Annual Awards for the year 2019-20



Late Raosahebada Pawar Award for Best Distillery being presented to Shri Ambalika Sugar Pvt.Ltd., Dist. Ahmednagar



Late Kisan Mahadev Alias Abasaheb Veer Award for Best Environmental Conservation being presented to Daund Sugar Pvt.Ltd., Dist. Pune



Late Dr. Appasaheb Alias SR Patil Award for Best Overall Cane Development Performance to Udgiri Sugar and Power Ltd., Dist. Sangli,



Best Cane Development Officer (South Zone) being presented to Shree Chhatrapati Shahu SSK Ltd., Dist. Kolhapur



Best Cane Development Officer (Central Zone) being presented to Bhimashankar SSK Ltd., Dist. Pune



Best Cane Development Officer (North-East Zone) being presented to Purna SSK Ltd., Dist. Hingoli



*Signature*





## Annual Awards for the year 2019-20



Oss Bhusan (Late Yashvantrao Chavan Award) being presented to Mr. Prakash V. Jadhav, Dist. Kolhapur, Shree Datta Shetkari SSK Ltd., Dist. Kolhapur



Oss Bhusan (Late Vasantnao Naik Award) being presented to Mr. Suresh K. Salunkhe, Dist. Sangli, Udagiri Sugar and Power Ltd., Dist. Sangli



Oss Bhusan (Late Annasaheb Shinde Award) being presented to Mr. Ashok H. Khot, Dist. Sangli, Rajarambapu Patil SSK Ltd., Sangli



Best Cane Development Officer Award being presented to Mr. Sarjerao S. Walte, Karmayogi Ankushrao Tope Samarth SSK Ltd., Dist. Jalna



Best Environmental Officer Award being presented to Mr. Sagar B. Patil, Krantiagrani Dr. G.D. Bapu Lad SSK Ltd., Dist. Sangli



Best Chief Engineer Award being presented to Mr. Vijay M. Khalkar, The Kadwa SSK Ltd., Dist. Nashik





## Annual Awards for the year 2019-20



Best Chief Chemist Award being presented to Mr. Shashikant V. Giramkar, Daund Sugar Pvt. Ltd., Dist. Pune



Best Distillery Manager Award being presented to Mr. Sayyadnur I. Shaikh, Shree Pandurang SSK Ltd., Dist. Solapur



Best Managing Director Award beign presented to Mr. Yashwant S. Kulkarni, Shree Pandurang SSK Ltd., Dist. Solapur



Best Employee Award (VSI) beign presented to Mr. SR Khengare, Cheif Accountant, Accounts & Purchase Section



Best Employee Award (VSI) beign presented to Mr. VD Ghule, Assistant Material Officer, Purchase Section,



Best Employee Award (VSI) beign presented to Mr. SK Sable, Scientist, Oil & Pices Section



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## Annual Awards for the year 2019-20



Best Employee Award (VSI) beign presented to Dr. PS Deshmukh, Scientist & Head, Soil Science Section



Best Employee Award (VSI) beign presented to Mr. RR Dhupal, Driver, Administration Section, VSI

## Annual Awards for the year 2020-21



Late Raosahebada Pawar Award for the Best Distillery being presented to Sharyu Agro Industries Ltd., Dist. Satara



Late Kisan Mahadev Alias Abasaheb Veer Award for Best Environmental Conservation being presented to Rajarambapu Patil Pvt.Ltd., Dist. Sangli



Late Kkarmayogi Shankarrao Patil Award for Best Overall Financial Management being presented to Udgiri Sugar and Power Ltd., Dist. Sangli



Late Dr. Appasaheb alias SR Patil Award for Best Overall Cane Development Performance being presented to Dr. Patangrao Kadam Sangli SSK Ltd., Dist. Sangli

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## Annual Awards for the year 2020-21



Late Vilasraoji Deshmukh Award for Most Innovative Factory Award being presented to Daund Sugar Pvt. Ltd., Dist. Pune



Late Vasantdada Patil Award for Best Overall Performance being presented to Krantiagrani Dr. GD Babu Lad SSK Ltd., Dist. Sangli



Best Technical Efficiency Award (South Zone) being presented to Yashwant Mohite Krishana SSK Ltd., Dist. Satara



Best Technical Efficiency Award (Central Zone) being presented to Daund Sugar Pvt.Ltd., Dist. Pune



Best Technical Efficiency Award (North-East Zone) being presented to Karmayogi Ankushrao Tope Samarth SSK Ltd. (Unit-1), Dist. Jalna



Best Cane Development Officer Award (South Zone) being presented to Jawahar Shetkari SSK Ltd., Dist. Kolhapur

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## Annual Awards for the year 2020-21



Best Cane Development Officer Award  
(Central Zone) being presented to  
Dwarkadhish Sakhar Karkhana SSK Ltd., Dist. Nashik



Best Cane Development Officer Award  
(North-East Zone) being presented to Natural Sugar and  
Allied Industries Ltd., Dist. Usmanabad



Best Financial Management Award  
(South Zone) being presented to Sahyadri SSK Ltd.,  
Dist. Satara



Best Financial Management Award  
(Central Zone) being presented to Dwarkadhish Sakhar  
Karkhana Ltd., Dist. Nashik



Best Financial Management Award  
(North-East Zone) being presented to Karmyogi  
Ankushrao Tope Samarth SSK Ltd. Unit-2), Dist. Jalna



Oss Bhusan (Late Yashvantrao Chavan Award) being  
presented to Smt. Vimal Dhondiram Pawar, Dist. Satara,  
Ajinkyatara SSK Ltd., Dist. Satara



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## Annual Awards for the year 2020-21



Oss Bhusan (Late Vasant Naik Award) being presented to Mr. Vishwanath D. Holsambare, Dist. Latur, Vilas SSK Ltd. (Unit-2), Dist. Latur



Oss Bhusan (Late Annasaheb Shinde Award) being presented to Mrs. Sulochana M. Kadam, Dist. Sangli, Rajarambapu Patil SSK Ltd. (Unit-2), Dist. Sangli



Best Cane Development Officer Award being presented to Mr. Somnath P. Bhalekar, Shree Pandurang SSK Ltd., Dist. Solapur



Best Environmental Officer Award being presented to Mr. Kalyan A. Gaikwad, Nira Bhima SSK Ltd., Dist. Pune



Best Chief Engineer Award being presented to Mr. Sandip V. Patil, Udgiri Sugar and Power Ltd., Dist. Pune



Best Chief Chemist Award being presented to Mr. Sunil T. Sawant, Rajarambapu Patil SSK Ltd., Dist. Sangli

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## Annual Awards for the year 2020-21



Best Chief Accountant Award being presented to Mr. Vijaykumar R. Sawarikar, Daund Sugar Pvt. Ltd., Dist. Sangli



Best Distillery Manager Award being presented to Mr. Pravinkumar S. Kale, Daund Sugar Pvt. Ltd., Dist. Pune



Best Managing Director Award being presented to Mr. Anil P. Shewale, Loknete Marutrao Ghule SSK Ltd., Dist. Ahmednagar



Best Employee Award (VSI) beign presented to Mr. PG Patil, Technical Advisor, Sugar Enginnering, VSI



Best Employee Award (VSI) beign presented to Mr. LS Dalvi, Senior Analytical Chemist, Sugar Technology, VSI



Best Employee Award (VSI) beign presented to Mr. AB Deshmukh, Scientist, Alcohol Technology & Biofuels, VSI



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## Annual Awards for the year 2020-21



Best Employee Award (VSI) beign presented to Mr. PV Ghodke, Scientist & Head, Agronomy, VSI



Best Employee Award (VSI) beign presented to Mr. JD Raybhar, Driver, Administration, VSI



Receiving prize of contribution for book written by Mr. RS Chandgude



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## National Technology day

National Technology day is held annually on May 11 to honor the contributions of India's scientific community including scientists, researchers and engineers. The theme for this year was "Integrated approach in science and technology for a sustainable future".

Dr. Sanjay Patil, Resources Scientist & Head, Maharashtra Remote Sensing Application Centre (MRSAC), Pune was invited as a chief guest for the technology day celebration at VSI on May 11, 2022. All staff members and students of VSI were present on the occasion. The program was coordinated by Dr. JM Repale. The function began with lighting of the lamp by the chief guest and the OSD, Mr. Sambhaji Kadupatil who also welcomed the guest with flowers. Dr. Deepali Nimbalkar briefed the audience about the significance of technology day and introduced the guest. After this, Dr. Sanjay Patil

delivered a lecture on 'Application of geoinformatics technology in agriculture'. He explained basics of remote sensing like remote sensing process, types of remote sensing, kinds of satellite, visual and digital image interpretation. He also explained remote sensing application in crop inventory, acreage estimation, cropping system analysis, production estimation, crop monitoring and condition assessment. He also explained use of hyper spectral sensors for identification of stress detection, varietal discrimination and disease identification. He briefed the work done in MRASC in the entire sector. The interactive session after the lecture was very interesting with lot of questions on varied applications of remote sensing, activities of MRSAC etc. from staff as well as students. The program concluded with a vote of thanks by Dr. Vivek Patil.



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1. The planting of drought tolerant varieties like CoC 671, VSI 434 and VSI 08005 should be undertaken in the drought prone area of Maharashtra.
2. The early planting (Pre-season planting) should be preferred (October-November) in the drought prone area.
3. Distance between two rows can be reduced upto 90 cm in the drought prone area.
4. Incorporation of sugarcane trash in soil instead of burning OR in situ decomposition with trash mulching to increase the fertility of soil, it has a major role in soil conservation, checks the weed growth, helps to minimize the impact of water stress as well as salt stress on crop.
5. The application of *Acetobacter diazotrophicus* bioinoculant @ 3 lit/ha in 500 lit of water as foliar application after 60 days of planting in morning hours.
6. To control sugarcane mealy bug or scale insects infestation in stress condition by removal of lower 2-3 dry leaves and spraying of Imidachloprid 17.8 % SL @ 300 ml/ha (0.3 ml/lit) is recommended.
7. For the management of Early shoot borer and Internode borer in stress affected sugarcane crop, the release egg parasitoid *Trichogramma chilonis* @ 3-5 lac parasitized eggs /ha in suitable instalments in the field and soil application of granular insecticide Fipronil 0.3 GR @ 25 kg/ha or Chlorantraniliprole 0.4 GR @ 22.5 kg/ha or Spraying of Chlorantraniliprole 18.5% SC @ 375 ml per ha (0.4 ml/ lit of water) is recommended.
8. Under abiotic stress condition the incidence of sugarcane diseases viz, pokkah boeng, rust, red rot, wilt, pineapple and whip smut is increasing as well as abnormalities viz., leaf scorching, drying of leaves, rotting of leaves, decaying of leaves, defoliation and banded chlorosis are also observed. To control these diseases and abnormalities the recommended prophylactic measures should be adopted for the management of sugarcane diseases and abnormalities under stress condition.

## Valorizing Waste from Sugar & Allied Industries

One-day workshop entitled 'Valorizing waste from sugar & allied industries' was jointly organized by the Department of Alcohol Technology and Biofuels, VSI and UK partners at Vasantdada Sugar Institute (VSI), Manjari (BK), Pune, India on March 31, 2022 with the active participation of sugar mills and distilleries from different States across the Country.

For this workshop following eminent Delegates & Speakers viz, Mr. Jayprakash Dandegaonkar, Chairman, NFCSFL & MRSSK Sangh Ltd., In Mr. Prakash Naikaware, MD, NFCSFL, India; Mr. Sanjay Khatal, MD, MRSSK Sangh Ltd., India; Prof. V. V. Ranade, Professor Emeritus, Queen's University Belfast, UK; Prof. SV Patil, Professor Emeritus, Alcohol Tech &







**Biofuels, VSI, India; Prof. Yogendra Shastri, Department of Chemical Engineering, IIT Bombay, India; Mr. Joseph Vimal, MD, J & F Biogas, Chennai, India; Mr. Gajendra Singh, Dhampur Sugar Mills Ltd., UP, India (Online); Dr. Vinod Kumar, Cranfield University, Cranfield, UK (Online); Dr. Ines Baptista, Green Fuels Research Ltd., Berkeley, UK (Online); Mr. Shivajirao Deshmukh, Director General, VSI, India; Mr. Sambhaji Kadupatil OSD, VSI, India and apart from this, total 133 participant (Sugar Mills: 79 and VSI; 54) were present and**

The workshop was inaugurated and welcome address was given by Mr. Shivajirao Deshmukh. He welcomed all the guests, sugar mill representatives and VSI staff. He told that Sugar and Allied Industries has huge opportunities for utilization of sugarcane bagasse (SCB) and press mud cake (PMC) for value added products such as bio-CNG, lactic acid, bio-butanol, succinic acid, xylitol, etc. He informed that VSI has collaborated with Nira Bhima SSKL for installation of two pilot scale anaerobic digesters to study various aspects and retrofit Compressed biogas (CBG) facility in existing sugar mill complex.

Introductory remarks were given by Mr. Jayprakash Dandegaonkar. He informed that India is importing 77% crude oil requirements and 50% of natural gas requirement and Government of India has set a target of reducing this import by at least 10% by 2022. He also told that India has set a target of 10% blending of fuel ethanol with petrol by 2022 and 20% blending by 2025 for ethanol blending programme. He also informed that GOI has invited expression of Interest by Oil Marketing Companies (OMCs) for production & supply of CBG under Sustainable Alternative towards Affordable Transportation (SATAT) programme. He further informed that Indian Sugar Mills generates 8-10 million tons of PMC and 100 million tons of SCB every year. He told that both PMC & SCB can be utilized for CBG production through anaerobic digestion (AD). SCB can be used to produce value added products such as bio-ethanol, bio-butanol, lactic acid, succinic acid and xylitol, etc. He emphasized that if 50 % of Sugar mills out of total 540 Sugar mills will adopt CBG technology, they will produce 3.75 lakh ton of CBG per annum with revenue of Rs. 1750 crore per annum to India and this will

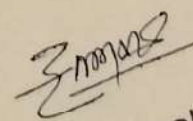
create employment opportunities. He also explained the market potential of lactic acid and succinic acid.

### Technical Session-I

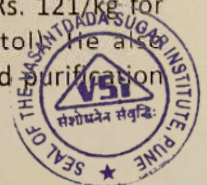
During the 1<sup>st</sup> technical section, Prof. VV Ranade gave a presentation on '**Valorising waste biomass via hydrodynamic cavitation and anaerobic digestion**'. He briefly discussed the visions of vWa project. He told that the PMC & SCB produced from sugar & allied industries could be converted in to bio-CNG & other value added products. He specially focused on hydrodynamic cavitation pretreatment method using vortex based devices for cavitation. He also also discussed biogas improvement for spent wash digester on commercial scale using cavitation pretreatment.

The 2<sup>nd</sup> technical presentation was delivered by **Prof. SV Patil** on the topic entitled '**Value added products from waste biomass**'. Prof. SV Patil started his presentation with the explanation of vWa project concept and the role of VSI in the project. In his talk, Prof. Patil emphasized mainly on bio-CBG and lactic acid production. He also explained about the achievement of biogas production of 480 M<sup>3</sup> per ton of dry PMC or 120 M<sup>3</sup> per ton of wet PMC. He also explained about the 45% enhancement of biogas production rate in case of PMC feed when the retention time was changed from 30 days to 20 days. On aspect of CBG production, Prof. Patil described 5 different types of CBG production models on Sugar Industry perspective.

The third technical presentation was delivered by Prof. Yogendra Shastri on the topic entitled '**Technologies for Sugar Industry Waste Valorization: Development and Scale-up Potential**'. He explained life cycle analysis for different products (lactic acid, succinic acid, xylitol & CBG) in vWa. He mentioned regarding the techno-economic & life cycle assessment of different value added products (Rs. 215/kg lactic acid, Rs. 37/kg of CBG, Rs. 121/kg for succinic acid & Rs. 230/kg for xylitol). He also explained biomethane and lactic acid purification work at IIT Bombay.



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## Technical Session II

During the 2<sup>nd</sup> technical session, Mr. Gajendra Singh, Dhampur Sugar Mills Ltd., UP, India gave a presentation on '**Biomethane production: An opportunity**'. He explained the single stage anaerobic digestion with cavitation and two stage anaerobic digestion. He explained anaerobic digestion data for 1M<sup>3</sup> and 7M<sup>3</sup> digester. He also shown flame test for 7M<sup>3</sup> digester. He also explained production of volatile fatty acids (acetic, propionic and butyric acids) during biogas production for two stage anaerobic digestion.

The 2<sup>nd</sup> technical presentation was delivered by Dr. Vinod Kumar on the topic entitled '**Sugarcane bagasse-based Production of Biochemicals**'. He focused on production of xylitol and succinic acid from SCB. He informed that 102.5 g/L of xylitol was produced through fed-batch fermentation from pure xylose in comparison to 86.6 g/L of xylitol from SCB xylose hydrolysate. He further informed that 36.7 g/L of succinic acid was produced from pure xylose in comparison to 28.7 g/L of succinic acid from SCB xylose hydrolysate.

The 3<sup>rd</sup> technical presentation was delivered by Dr. Ines Baptista on '**Towards biobutanol production: ABE fermentation of sugarcane bagasse hydrolysate**'.

She emphasized on biobutanol production from synthetic media and SCB hydrolysate containing both glucose and xylose.

The 4<sup>th</sup> technical presentation was delivered by Mr. Joseph Vimalon on '**CSTR Semi dry fermentation technology**'. He described in detail about pros and cons of semi-dry fermentation technology in the field of bio-digestion for various different substrates (paddy straw, press mud, cane trash, Napier grass).

The technical session I & II was coordinated by Dr. Kakasaheb Konde, Head, Professor and Technical Adviser, AT & B, VSI, India.

In the panel discussions, Mr. Shivajirao Deshmukh, Mr. Sambhaji Kadupatil, Mr. Prakash Naiknavare, Prof. Yogendra Shashtri, Mr. SD Bokhare, Prof. Vivek Ranade, Prof. SV Patil and Dr. KS Konde were present on the dias. There was lot of deliberation made on use of vWa technologies for production of value added products (bio-CNG, bio-butanol, lactic acid, succinic acid, xylitol) and their adoption in sugar and allied industries. The participants of the workshop raised many questions and doubts about the use of feed stocks released from sugar & allied industries and necessary explanation were provided by the delegates.

The programme was concluded with vote of thanks given by Mr. Sambhaji Kadupatil.



*Z. M. Deshmukh*

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## Overview of Distilleries and Alcoholic Beverage Industry

Mr. Prasad Survey, Deputy Divisional Commissioner, Pune, State Excise, Government of Maharashtra State requested VSI to arrange half day training programme on 'Overview of distilleries and alcoholic beverage industry' for their 113 trainee officers. In this regard Department of Alcohol Technology & Biofuels (AT & B), VSI conducted half day training programme on 18<sup>th</sup> February 2022 for the trainee State Excise Officers, Government of Maharashtra. Mr. SR Jadhav, Deputy Superintendent, Hadapsar, Pune, Mr. Yuvraj Shinde, Deputy Superintendent, Pimpri Chinchwad and other few officers of training center Khandala were also present for the training programme.

In the training Mr. DA Patil, Assistant Professor & Joint Technical Adviser, AT & B, elaborated the importance of the course to the participants.

The first lecture was delivered by Mr. RV Godage, Assistant Professor & Joint Technical Adviser, AT & B. He has briefly presented his presentation on the topics such as Molasses quality, Storage of molasses, Batch fermentation, Continuous

fermentation, Atmospheric and Multipressure distillation, Characteristics of rectified spirit, Extra neutral alcohol, Fuel ethanol, Azeotropic distillation, Molecular sieve dehydration and DFPD Guidelines,

Mr. DA Patil has presented his presentation on topics such as Role of Excise in distillery unit, Alcoholic fermentation process, Factors affecting on distillery performance, Atmospheric distillation process, Production process of country liquor, Indian made foreign liquor (Whisky, Brandy, Rum, Gin & Vodka), records and registers to be maintained in CL & IMFL, taxes and duties on molasses and alcohol.

Dr. KS Konde, Associate Professor & Technical Adviser, AT & B, thanked to the Commissioner, State Excise, GoM and their Officers for sending their trainee officers for training. He has also taken the review of the lectures.

In the concluding session of the training programme, Mr. Prasad Survey thanked to the management of VSI and concern staff of AT & B for giving valuable information about training to the trainee officers.



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## TRAINING TRAINING

### Traditional vs Scientific Technologies for Mahua Spirit and Heritage Alcoholic Beverages Production-Optimization, Evaluation and Training (Heritage Wine Policy)

A training programme for tribal representatives was conducted from **January 10-28, 2022** under the research project entitled 'Traditional vs scientific technologies for Mahua spirit and heritage alcoholic beverages production-optimization, evaluation and training (heritage wine policy)' was carried out by **Department of Alcohol Technology and Biofuels (AT& B), VSI**. This project is sanctioned by Principal Secretary, Department of Commercial Tax, Govt. of Madhya Pradesh and funded by Ministry of Tribal Affairs, Govt. of India.

**Total 13 participants and Mr. Anirudh Mookerjee**, project consultant attended the training programme. The participants were from Dindori and Alirajpur Dist. of Madhya Pradesh (MP) and most of the participants were tribal people. Participants were from various backgrounds such as farmer, Excise Officer and science students. Mr. Rajesh Henry, Additional Excise Commissioner, GoMP attended the training programme for one day. As instructed by GoMP, the training programme was conducted in Hindi.

Prof. SV Patil, Technical Adviser & Head, Department of AT & B briefly explained to the participants regarding all departmental activities with special reference to the Mahua project.

The training programme covered different topics such as alcoholic & non-alcoholic beverages, Mahua tree & its importance, traditional vs scientific fermentations & distillation, analysis of total reducing sugar, ethanol & total organic volatile acidity, concept of sensory evaluation, isolation & maintenance of yeast culture, understanding pilot & effluent treatment plant, ideal packaging methods and rules & regulations linked to the Excise Department. The course also included hands-on practical based on the above topics which will be helpful for the participants while working at pilot demo plant at MP. During the training period, there was a one-day visit to

BrimaSagar Maharashtra Distilleries Ltd, Shreepur, Solapur, Maharashtra in which participants were acquainted about the Industrial pot distillation and foreign liquor.

On the occasion of the concluding session on January 28, 2022, the training certificates were given to the participants by Mr. Shivajirao Deshmukh, DG, VSI. He also briefed importance of this project about Mahua liquor. All the participants introduce their self and gave their positive feedback. During the session, discussion was also held and session was concluded with vote of thanks by Dr. S. Behera, Scientist, VSI.



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## INTERACTIVE MEET

### Use of Retro Fitment Kits for Compressed Bio Gas (CBG)/Compressed Natural Gas (CNG) for Agricultural Tractors

One day interactive meet on 'Use of Retro Fitment Kits for Compressed Bio Gas (CBG)/Compressed Natural Gas (CNG) for Agricultural Tractors' was jointly organized by Vasantdada Sugar Institute (VSI) and Central Institute of Road Transport (CIRT), Pune on 30<sup>th</sup> August 2021. Meeting was attended by representatives from sugar mills (Nira Bhima SSKL, Natural Sugar & Allied Industries Ltd, Malegaon SSKL and Kukadi SSKL), representatives of manufactures/suppliers of Retro Fitment Kits (Rawmatt India, Mankar Gas Agencies and CBGplus), CIRT team & VSI team. Total 40 participants attended the interactive meet.

Welcome address was given by Mr. Shivajirao Deshmukh, DG, VSI. He highlighted importance of retro-fitment of kits to agricultural tractors in view of increasing prices of diesel and related benefits to the farming community.

Mr. Sambhaji Kadupatil, OSD, VSI briefed the purpose of meeting and role of CIRT, Kit manufacturer/suppliers, sugar mill and VSI. He mentioned that CIRT will be involved in certification of kit. They also monitor safety aspects and performance of the retro fitted vehicles. Kit manufacturers will provide kit

specification to CIRT/VSI and kits to VSI/sugar mills. They will be responsible for conversion of tractors from Diesel to CNG. Sugar mills will provide information such as load carrying capacity and range required for tractors. Sugar mills will also provide tractors for conversion and conduct trials with the help of kit manufacturers. VSI will facilitate the retro fitment of kit with the help of CIRT, Pune. VSI will also provide two/three tractors for retro-fitment and will be involved in trials.

Mr. BB Thombare, Chairman and Managing Director, Natural Sugar & Allied Industries Ltd., emphasized that sugar mills should take the responsibilities of converting existing tractors to CNG which will help farmers to save up to 50% on their fuel cost which will ultimately result in reducing the harvesting and transportation cost in FRP price.

Mr. Harshvardhan Patil, Hon. Ex-Minister mentioned that price of kit should be affordable to the farmers. He also mentioned that conversion should not compromise performance of tractor. He also emphasized that only dual fuel kits should be used for trials.





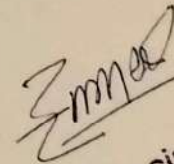


Mr. Narendra Murkumbhi, Chairman, Technical Committee, VSI also participated in the meet via video conferencing. He welcomed the initiative taken by VSI and explained about the market potential along with its benefits to sugarcane growers/sugar mills.

During interactive discussion, the kit manufacturers explained about the technical specifications of dual fuel kit for tractors. They also shared the details of vehicles which have been converted from diesel to CNG. On the basis of their past experience they assured that dual fuel kit conversion for tractor is possible. However, they have emphasized that trials need to be conducted on agricultural tractors. They

also explained advantages and disadvantage of mono and dual fuel kits.

In concluding remarks, Prof. SV Patil, Head & Technical Adviser of Department of Alcohol Technology & Biofuels, VSI, mentioned that each of the participating sugar mill can convert minimum about six tractors to CNG/CBG using kits offered by respective retro-fitment vendors. He also mentioned that all interested sugar mills are requested to invite the concerned vendor to finalize the retro-fitment at their factory. He finally thanked all the participants for attending meet and their support in this initiative.




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- Composition of cane and juice, principles of cane juice clarification with different types of liming and sulphitation process and tips to improve clarification efficiency.
- Role of Reducing sugar in sugar processing and various measures to reduce the final molasses purity.
- Pan Boiling: Theory of pan boiling, Tips to improve exhaustion in all grades massecuites
- Vertical and horizontal continuous pan and operational problems.
- Decanter and rotary vacuum filter
- Quality of sugar with reference to various test parameters , various types of sugars and liquid sugar.
- Intermediate boiling house products colour and their impact on final product
- Various measures to reduce the steam consumption in sugar mill
- Various measure to achieve best efficiency and sugar quality, during B Heavy diversion
- Molasses quality – Total reducing sugar and Un-fermentable sugar
- Water management in sugar mills & recent trends in water management in sugar processing- Type of technologies for sugar condensate polishing units, ETP & STP Operation

## Milling Plant

Department of Sugar Engineering, VSI conducted a one week duration tailor made short term training programme for Balarampur Chini Mills Ltd., groups Haidergarh Unit (UP) for engineering department heads, sectional heads and mill engineers of ten sugar mills on the 'Milling Plant' from 9<sup>th</sup> to 14<sup>th</sup> August 2021. Total 32 engineers participated in the training programme. Unit Head, Haidergarh unit, Corporate Technical Team Head (CTT Engineering) and HR officers, inaugurated the short-term training programme.

Mr. SP Nalawade Joint Technical Advisor and Mr. DN Shiotle conducted short-term training programme. In short term training different topics like cane handling, cane preparation, cane milling, mill gearing, hydraulic system, capacity and power calculations,

mill setting & trash plate profile. In addition to this, virtual training conducted on modern trends in juice extraction and power saving in milling plant by Mr. RA Chandgude-Technical Adviser & Head and Mr. PG Patil -Technical Adviser (Electrical).

The training programme also included practical calculations for sugar mill imbibitions, dilution ratio, juice drainage, mill capacity, power, mill setting and trash plate profile. The department heads of sugar units presented best practices adopted of their mills for repair and maintenance. They also, conducted the survey along with CTT Head along with participating engineers to Haidergarh plant and discussed on the mill performance, best practices in maintenance of milling plant.

## Environmental Clearance, Compliances, Violations and Uploading of EC on Parivesh Portal

The Ministry of Environment Forests & Climate Change has taken steps to improve the environmental compliance process and also to bring transparency in this regard. As a part of this, its required that all the industries upload the information of their existing

ECs online on Parivesh portal to help in the effective implementation of the EC condition. In order to help our member sugar mills in this aspect, the Department of Environmental Sciences organized an online workshop and demonstration under the auspices of





**"Azaadi ka Amrut Mahotsav on 13<sup>th</sup> August 2021.**

This workshop was a joint effort of Maharashtra Federation of Cooperative Sugar Factories, Sugar Commissionerate, Government of Maharashtra & VSI. The workshop was attended by 95 participants. Mr. Sambhaji Kadupatil, OSD, VSI welcomed the participants in the beginning with an outline of the program. After this Mr. Shivajirao Deshmukh, Director General welcomed all participants and dignitaries. On the occasion of 'Azadi ka Amrut Mahotsav', he briefly covered evolution of sugar industry in India and particularly cooperative sugar sector in Maharashtra. Taking note of increase in the environmental issues in this industry, he urged the factory personnel to seriously look into it.

Mr. Sanjay Khatal (MD, Maharashtra Federation of Cooperative Sugar Factories) picked up the same thread from DG, VSI and emphasized that global warming and climate change have become a major challenge for all of us. He expressed that sugar industry is now viewed as a bio-energy complex. Hence, the programme like this, which addresses environmental issues are immensely important. Towards end of his speech, he requested all participants to shift from 'chaltahai' (taken for granted) attitude and become serious on environmental issues.

Mr. Shekhar Gaikwad, Sugar Commissioner, in his speech, also emphasized on the pollution issue. In

addition, he explained the role of sugar industry in Ethanol Blended Petrol (EBP) programme and economy of the state. He concluded his speech by giving best wishes to participants and organizers.

Mr. Prakash Naikavare (MD, National Federation of Cooperative Sugar Factories) joined the session as a participant. He expressed his eagerness to understand the present issue. This was followed by a presentation on 'Environmental Clearance Compliances and Violations' by Dr Deepali Nimbalkar where she explained the difference and the various notifications pertaining to the issue. She also talked about the special provisions for environmental clearance available for ethanol projects and the applicability of NIPL & B2 category. She stressed on the seriousness of complying with the EC conditions and the fines for various violations.

After the presentation, Dr. Vivek Patil and Mr. Kapil Uphade gave an online demonstration of registration of project on Parivesh portal of MoEFCC and uploading of the EC documents in the same. The EC documents of Vilas SSK were uploaded as a part of this demonstration.

There was active participation from the audience. They raised number of queries, followed by the demonstration. These queries were satisfactorily answered by staff of Dept of Environmental Sciences, as well as DG, VSI. The programme ended with vote of thanks proposed by Dr. Amol Deshmane.



  
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## Opportunities for Sugar/Distillery Industry in Compressed Biogas (CBG) Sector

Webinar on 'Opportunities for Sugar/Distillery Industry in Compressed Biogas (CBG) Sector' was organized by dept. of Alcohol Tech & Biofuels, Vasantdada Sugar Institute (VSI), on 2<sup>nd</sup> June 2021.

Mr. Sharad Pawar, Hon. President, VSI, & Member of Parliament (Rajya Sabha) and Mr. Dilip Walse-Patil, Hon. Vice-President, VSI, Minister of Home, GoM was the Chief Guest in the Webinar. Following members viz., Mr. Harshvardhan Patil, Hon. Ex-Minister, Maharashtra; Mr. Jayprakash Dandegaonkar, Chairman, NFCSEFL & MRSSKS Ltd; Mr. Shivajirao Deshmukh, Director General, VSI; Mr. Shekhar Gaikwad, Commissioner of Sugar, GoM; Mr. Vishal Patil, Governing Council Member, VSI; Mr. Abhinash Varma, Director General, ISMA; Mr. Prakash Naiknavare, Managing Director, NFCSEFL Ltd and Mr. BB Thombare, Chairman, Natural Sugar were present as the panelist in the webinar. The webinar was attended by 181 participants from members and non-members Distilleries and Sugar Factories.

Mr. Shivajirao Deshmukh, DG, VSI welcomed all delegates. He emphasized on the opportunities for sugar industry in the field of bio-CBG production using different feedstock. CBG has the potential to replace CNG in automotive and industrial sector. CBG plant can be operated on press mud cake (PMC) or sugarcane bagasse (SCB) or their mix throughout year which will generate additional revenue to sugar mills.

Key note address was given by Mr. Sharad Pawar. He talked about the present scenario on the current energy consumption and current imports of crude oil and natural gas in India. GoI has set a target of reducing this import by at least 10% by 2022. He informed that different renewable energy feedstocks (PMC, SCB, municipal solid waste, etc) is being promoted by GoI for the production of CBG and various schemes for CBG. He also mentioned that there is potential of 3.75 lakh ton of CBG per annum in India & 1.50 lakh ton of CBG per annum in Maharashtra with revenue of Rs.1750 crore per annum to India and Rs.700 crores per annum to Maharashtra if 50% of sugar mills will go for CBG production which will create huge employment opportunity and can boost economic development.

In the technical presentations following members were delivered talks;

Prof. SV Patil talked on circular bioeconomy for CBG and organic fertilizer production for sugar mills. He

informed about the SATAT scheme. GoI has planned to set up 5000 CBG plants by 2025 in phased manner. Ministry of New & Renewable Energy (MNRE) has declared subsidy of Rs. 4.00 crore per 4800 kg CBG per day and Rs. 10.00 Crore per project. Department of Agriculture and Farmers Welfare, GoI has notified that fermented digestate from anaerobic digester of PMC/SCB/ PMC/other agro-wastes as fermented organic manure. There are schemes for financial support for CBG Plants by State Bank of India and Bank of Baroda. He also mentioned that VSI is setting up of two pilot digesters with financial assistance from Nira Bhima SSKL for the production of biogas from PMC, SCB, sugarcane trash (SCT) and mixture of PMC, SCB and SCT.

Mr. RB Lad, Mr. Praveen Badiger and Mr. NS Mohan in their presentation discussed their digester technology for biogas production and membrane technology for biogas purification.

Mr. Sanjay Murgai, Head CBG Projects, JBM Renewables (Jay Bharat Maruti Group), Dr. AV Mohan Rao and Mr. Mohit Gupta, SERL also presented their work on CBG. They have presented data and technology in their two running plants (Warananagar, Maharashtra and Rohtak, Haryana) on PMC.

Mr. Nitin Shete, Vice President, Praj Industries Ltd. He explained the possibility of conversion of PMC, SCB and spent wash for CBG production. He also proposed a model for supply of dual fuel kits (Diesel + CBG) for truck, tractors and small 3 and 4 wheelers which can reduce 30 to 40% of transport costs. He mentioned that Praj has developed 4 key commercial technologies such as microbial consortium for feedstock pretreatment, rumen microbe's consortium for high yield and fast anaerobic digestion process, high efficiency biogas up-gradation to CBG and high quality bio-manure formulation.

Mr. Aakash Gundawar, Untied Enviro Pvt. Ltd., Pune. He explained CBG production technologies, its advantages and feedstock for CBG.

Afterwards, there was a panel discussion with Mr. Dilip Walse-Patil, Mr. Jayprakash Dandegaonkar, Mr. BB Thombare, Mr. Vishal Patil, Mr. Praveen Badiger, Mr. NS Mohite, Mr. Shekhar Gaikwad, Mr. Prakash Varma, Mr. Shivajirao Deshmukh and Mr. Prakash Naiknavare.







In the concluding session, Mr. Dilip WalsePatil mentioned that given the abundance of biomass in the country, CBG has the potential to replace CNG. He also mentioned that digestate that comes out from the digester can be used as bio-manure. This will also help to replace chemical fertilizer partly with

organic fertilizer and contribute to move towards sustainable agriculture.

In concluding remarks, Mr. Shivajirao Deshmukh thanked all dignitaries and delegates present for attending the Webinar. He requested all sugar mills to come forward and take initiative in production/supply of CBG.

## Oos Sheti Dnyanyag & Dnyanlaxmi

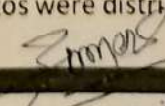
In the memory of the founder president of VSI late Padmabhushan Dr. Vasantdada Patil, VSI organised 'Oos Sheti Dnyanyag & Dnyanlaxmi' residential farmer's training program for men and women sugarcane growers of Maharashtra state. The training program was conducted as per the government guidelines regarding covid-19 pandemic disease and training batches were organised in the month of July & August 2021 as details are given in following table; In Oos Sheti Dnyanyag and Dnyanlaxmi training programmes, 296 sugarcane farmers participated from

varieties & varietal planning, seed nursery management, tissue culture, modern planting techniques, weed management, soil fertility and fertilizer management, irrigation water management, use of bio-fertilizers, farm mechanization, sugarcane economics, ratoon management and integrated disease & pest management were taken and practicals & field demonstrations conducted by subject experts of different Sections/Dept. of Agriculture Divisions of VSI.

Batch No.	Period	Area from which the farmers participated	No. of participants	Number of Sugar Mills & Individuals
<b>Oos Sheti Dnyanyag programme (Men farmers)</b>				
I	5 <sup>th</sup> to 8 <sup>th</sup> July 2021	Kolhapur District and Vidarbha region	58	Sugar mills – 04 Individual – 02
II	13 <sup>th</sup> to 16 <sup>th</sup> July, 2021	Sangli and Satara Districts	63	Sugar mills – 05
III	20 <sup>th</sup> to 23 <sup>th</sup> July, 2021	Pune, Ahmednagar and Nashik Districts	50	Sugar mills – 03 Individual – 06
IV	27 <sup>th</sup> to 30 <sup>th</sup> July, 2021	Solapur District and Marathwada region	51	Sugar mills – 04 Individual – 03
V	10 <sup>th</sup> to 13 <sup>th</sup> August, 2021	Marathwada region (Special batch)	40	Sugar mills – 02 Individual – 05
<b>Oos Sheti Dnyanlaxmi programme (Women farmers)</b>				
VI	3 <sup>rd</sup> to 06 <sup>th</sup> August, 2021	Sangli, Satara and Solapur Districts.	34	Sugar mills – 04
<b>Total participants (Women +Men)</b>			<b>296</b>	Sugar mills – 18 Individual – 16

different parts of Maharashtra. Out of total sugarcane farmers, 16 sugarcane farmers participated individually and 18 were sponsored by the sugar mills. Each batch of training was inaugurated by the representatives from participated farmers and welcome address was delivered by the training coordinator. Lectures on various topics like sugarcane

In the final session of every batch, the trainees got their doubts cleared from the subject experts. In the concluding function, the representative trainee farmers expressed satisfaction about the training, lodging and boarding facilities. The certificate along with group photos were distributed to the trainees.

  
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## EVENTS EVENTS

### Oxygen Production in Sugar Mills and Status of Oxygen Demo Plant at Dharashiv Sakhar Karkhana Ltd.

Under the guidance of Mr. Sharad Pawar, Hon. President, VSI, the Institute sent letter to all sugar mills in Maharashtra for exploring the possibility of production oxygen in sugar mills when country is facing shortage of medical oxygen in COVID-19 situation. In this context, virtual mode meeting on "Oxygen Production in Sugar Mill-Way Forward" was organized by VSI on April 24, 2021. Meeting was attended by ministers from Maharashtra, Chairmen of NFCSFL & MRSSKS Ltd., Chairman of various sugar mills, and Managing Directors from various sugar mills and scientist from VSI.

VSI Scientist explained three options for early oxygen production as molecular sieve (3 Å) replaced with another zeolite molecular sieve (OX19 or OX8 or 13 X) which are suitable for oxygen production. Air has to be filtered for removing dust, particulate matter, oil and moisture before feeding to molecular sieve. In addition to this existing cycle time used in ethanol plant need to be changed. Further, oxygen booster compressor has to be installed to increase pressure (around 150 bar). Second option was to purchase of skid mounted oxygen generators with capacity from 10 m<sup>3</sup>/h to 50 m<sup>3</sup>/h. These units can produce 30-150 oxygen cylinders per day which can be sufficient for 80-300 bed capacity hospitals. This plant also uses PSA (pressure swing adsorption), a technology to generate oxygen from air and third option was to purchase of portable oxygen concentrator with capacity of 5 or 10 L/h which is sufficient for supplying oxygen to one/two patients depending oxygen requirement.

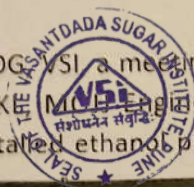
VSI officers contacted several vendors & suppliers of skid mounted oxygen generators & portable oxygen


concentrators and requested them to provide techno-commercial proposals for different capacities. In continuation, second online meeting of purchase committee was held on April 29, 2021 to finalize the order for skid mounted oxygen generators and portable oxygen concentrators and to review the progress of demo of oxygen production by modifying ethanol plant at Dharashiv Sakhar Karkhana Ltd. Offers received from SNCE and OxAir for skid mounted oxygen generators were scrutinized and negotiated. Offers received from SNCE and BPL for portable oxygen concentrators were scrutinized and negotiated. Offers received from SNCE and EKC for oxygen cylinders were also scrutinized and negotiated during meeting. During meeting, it was discussed that there is a shortage of cylinders for oxygen storage. It was decided that since during the lockout most of the industrial units are closed and have empty oxygen cylinders. These cylinders can be used by oxygen producing plants initially.

It was decided to purchase orders for more than 20 skid mounted oxygen generators and 600 portable oxygen concentrators have been placed by Maharashtra sugar mills so far. The above information was also passed on to sugar mills in UP, Haryana, Punjab, Karnataka and as per our information purchase orders for more than 15 Skid Mounted Oxygen Generators have been placed by sugar mills in these states.

#### Dharashiv Sakhar Karkhana Ltd. (DSKL) - Oxygen Demo Plant

As per suggestion given by DGS VSI a meeting was held with Chairman of DSKL Engineering Systems Pune, who had installed ethanol plant at



  
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## EVENTS EVENTS

### National Seed Day

Vasantdada Sugar Institute, Pune organized National Seed Day on October 01, 2020. This program was sponsored by ICAR seed project. On this occasion *Shiwarpheri* was organized at Lonarwadi & Naigaon seed production farm for cane grower farmers of sugar mills and Agriculture Assistants.

During the *Shiwarpheri* at Lonarwadi, Dr. RS Hapase, Principal Scientist & Head of Plant Breeding Section, gave the talk on 'Importance of released varieties & its identification', Mr. SS Katake, Scientist & Farm Manager, talked on 'Sugar cane seed nursery & one eye bud settlings production' and Mr. RG Yadav, Scientist & Head of Section Entomology on 'Sugarcane plant protection and its control measures'.

Dr. JM Repale, Senior Scientist, Plant Breeding section gave introduction on 'Importance of released varieties & its identification', Mr. RN Gaikwad, Scientific Officer, Farm Section, briefed about 'Sugarcane seed nursery & one eye bud settlings production' and Dr. BH Pawar, Senior Scientist & Head of Plant Pathology Section, talked on 'Sugarcane plant protection and its control measures at Naigaon farm'.

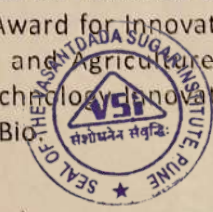
For this program total 40 participants of three sugar mills participated due to COVID19 pandemic disease, limited sugar mills was invited.

### To Enhance Fuel Ethanol Production by Diverting Sugarcane Juice/ Syrup or B-heavy Molasses or Sugar

Interactive meeting and discussion on 'To enhance fuel ethanol production by diverting sugarcane juice/syrup or B-heavy molasses or sugar' was organized by Commissioner of Sugar, Government of Maharashtra and *Maharashtra Rajya Sahakari Sakhar Karkhana Sangh Limited (MRSSKSL), Mumbai* on October 02, 2020 at Vasantdada Sugar Institute, Pune. The meeting was chaired by Hon. President of VSI Mr. Sharad Pawar, along with Mr. Ajitdada Pawar, Dy. Chief Minister, Government of Maharashtra, Mr. Jayant Patil, Minister of Water Resources and Command Area Development, GoM, Mr. Dilip Walse-Patil, Minister of Labour and State Excise, GoM, Mr. Rajesh Tope, Minister of public Health and Family Welfare, GoM, Mr. Shamrao alias Balasaheb Patil, Minister of Co-operation & Marketing, GoM, Mr. Shambhuraj Desai, State Minister of Home (Rural), State Excise, Finance & Planning, Skill Development And Entrepreneurship and Marketing, GoM, Mr. Jayprakash Dandegaonkar, Chairman of MRSSKSL, Mr. Shriram Sahadu Shete, Vice Chairman of MRSSKSL, Mr. Harshavardhan Patil, Mr. Shekhar Gaikwad,

Commissioner of Sugar, Mr. Kantilal Umap, Commissioner of State Excise, Dr. Pramod Chaudhary, President, Praj Industries Ltd., Mr. BB Thombare, Chairman, WISMA, Mr. Rohit Pawar (MLA), Vice Chairman, WISMA, Mr. Prakash Naiknaware, Managing Director, National Co-operative Sugar Factories Federation, Mr. Sanjay Khatal, Managing Director, MRSSKSL, Mr. Shivajirao Deshmukh, Director General, VSI, Mr. PK Mirase, Assistant Secretary (Technical), Maharashtra Pollution Control Board and Officers of Commissioner of Sugar, Commissioner of State Excise and MRSSKSL attended the meeting.

On this occasion Hon. President of VSI Mr. Shard Pawar felicitated Dr. Pramod Chaudhari, founder chairman, Proj Industries Ltd., Pune, for his award as he became first Indian to be honored with George Washington Carver Award for Innovation in Industrial Biotechnology and Agriculture by Washington DC-based Biotechnology Innovation Organization (BIO) and IowaBio.



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In the meeting industrialist presented their views and various issues related to production of fuel ethanol from sugarcane juice/syrup, B-heavy molasses and Sugar. The economics and disposal of distillery effluents through zero liquid discharge (ZLD) were also discussed.

After presentations, Mr. Ajitdada Pawar, Mr. Jayant Patil, Mr. Dilip Walse-Patil, Mr. Rajesh Tope, Mr. Shamrao alias Balasaheb Patil, Mr. Shambhuraj Desai, Mr. Jayprakash Dandegaonkar, Mr. Harshavardhan Patil, Mr. Shekhar Gaikwad, Mr. Kantilal Umap, Mr. BB Thombare, Mr. Shivajirao Deshmukh and Mr. PK Mirase, expressed their views on the existing problems faced by the sugar and distillery industry. They emphasized on present difficult economical conditions of sugar mills which is resulting into non availability funds for new

distillery, expansion of existing distillery and installation of ZLD technologies. They also requested the GoM for issuing licenses from commissioner of state excise and consent from MPCB and also requested to help for getting soft loan from central or state governments.

In concluding remarks, Mr. Sharad Pawar addressed to all distinguished guest and delegates. He appealed and requested to all sugar mills and distilleries to divert maximum sugarcane juice/syrup or B-heavy molasses for ethanol production that will help to bring down stocks of sugar and also improve the financial health due to maximum revenue generated from ethanol. He also ensured that issues raised by the participants should be discussed with DFPD and CPCB/MoEF officers to understand their views and further necessary action should be taken.



Interactive meeting presided over by Mr. Sharad Pawar Hon. President, VSI



Mr. Sharad Pawar Hon. President, VSI felicitated Mr. Pramod Chaudhari, founder chairman, Proj Industries Ltd., Pune

## National Webinar on Preparations for Ethanol Production from BH Molasses, Cane Juice, Syrup and Sugar

National webinar on 'Preparations for ethanol production from BH molasses, cane juice, syrup and sugar' was jointly organized by Vasantdada Sugar Institute (VSI) and the Ethanol Manufacturers Association of India, Indian Sugar Mills Association (ISMA), National Federation of Co-operative Sugar factories Ltd. (NFCFSF), All India Distillers' Association (AIDA) and MRSSK Sangh Ltd. at VSI, Manjari (BK), Pune, India on November 4, 2020.

Total 240 participants attended the webinar. During the inauguration function, welcome address was given by the Hon. President of VSI Mr. Sharad Pawar. He highlighted current ethanol demand & supply status, ethanol blending policy and importance of sustainable energy. He mentioned about National Policy on Biofuels - 2018 and new agenda of Sustainable Sector. He also emphasized on GoS Make in India & Swachh Bharat Abhiyan for doubling of Farmer's





Income, Import Reduction, Employment Generation and Waste to Wealth Creation.

Dr. SV Patil, Head & Technical Adviser of Department of Alcohol Technology & Biofuels, VSI delivered the presentation on '**Challenges, strategy and cost-economics of ethanol production from multiple feedstock**'. He described the objectives and agenda of the event. He emphasized on Indian and world sugar balance sheet, ethanol demand and price trend. He explained how current ethanol blending demand can be met by diverting sugar to B-heavy route. This will help to reduce surplus sugar stock and also promote EBP. He discussed two case studies (with bio-compost and incineration routes) for fuel ethanol production using different sugarcane feedstocks (C-molasses, B-heavy molasses & Sugar cane syrup) and their combination. Mr. Abinash Verma, Director General, ISMA summarized the presentation given by Prof. SV Patil. He then shared his views especially on current ethanol pricing and EBP programme. He mentioned that sugar diversion to ethanol will help to avoid surplus sugar stock for timely payment of FRP to the farmers. He also emphasized on need of increasing distillery capacity to fulfill current ethanol demand.

Dr. R Dani, Head, Sugar Technology, VSI delivered presentation on '**Implementation of DFPD guidelines in sugar mill for diversion of BH molasses or other feedstock for ethanol production**'. He highlighted Part-I, II, III of DFPD guidelines. He also focused on guidelines & requirements of storage of different feed-stocks & colour coding under Part-II of DFPD guidelines. He also explained about diversion of sugarcane juice/syrup, production, dispatch and stock records of each feed stock, recovery calculations for partial diversion of juice/syrup.

Mr. Prakash Naikaware, Managing Director, National Co-operative Sugar Factories Federation summarized the presentation given by Dr. R Dani. He mentioned that around 426 cr lit of ethanol will be required to fulfill 10% ethanol blending by 2022. He pointed out that there is need to speed up process of EC clearance for EBP promotion.

Dr. Vidyasagar Sidnale, Sr. Sugar Technologist, Sugar Technology, VSI gave presentation on '**Challenges and**

**remedies in sugar processing while diverting BH molasses or other feedstock for ethanol production**'. He explained about advantages of BH diversion in sugar plant, challenges & remedies for BH diversion etc.

Mr. Vivek Pittie, President, ISMA summarized the presentation given by Dr. VP Sidnale. He highlighted about steam and other saving due to diversion of sugar to B-heavy/Syrup route. He pointed out that some pollution boards are rejecting bio-compost route for ZLD and also insisting on CO<sub>2</sub> plant installation which may cause additional cost burden on sugar mills and slowdown EBP.

Mr. Avinash Deshmukh, Technical Officer, Alcohol Technology & Biofuels, VSI delivered presentation on '**Implementation of DFPD guidelines in distillery for ethanol production**'. He explained National Biofuel Policy-2018, vision & goals of policy, Part-I/II & III guidelines in details. He also explained pricing of biofuels and DFPD guidelines in connection to ethanol storage (PESO Norms).

Mr. Rahul Patil, Technical Officer, Sugar Technology, VSI gave presentation on '**Methodology to be used for FRP recovery calculations during diversion of BH molasses or syrup**'. He explained about day recovery loss calculation during diversion of BH molasses, preparation of weekly report, fortnight report & RT7© report.

After presentations, Mr. Vijaysinh Mohite-Patil, President, EMAI, Mr. Jayprakash Dandegaonkar, Chairman of MRSSKSL, Mr. Shivajirao Deshmukh, Director General, VSI, Mr. Kantilal Umap, Commissioner of State Excise, Mr. Prakash Naikaware, Managing Director, National Co-operative Sugar Factories Federation, Mr. Vivek Pittie, President, ISMA, Mr. Abhinash Verma, Director General, ISMA and Mr. VN Raina, Director General, AIDA participated in panel discussion and deliberations on the webinar. Mr. Jayprakash Dandegaonkar emphasized that it is necessary to calculate profitability for different routes on case to case basis from VSI. He also mentioned about reduction of sugar stock by diverting it to ethanol production for survival of sugar industry in future. Mr. Kantilal Umap appreciated that the webinar was very elaborative, integrated and interactive by





Involving various stakeholders from institutions, industry and Govt sectors. He informed about newly formulated state excise policy by GoM which is supporting EBP. Mr. Vivek Pittie mentioned about ethanol pricing formula need to put in public domain for increasing investor/sugar mill confidence. He also mentioned about ethanol blending need to be allowed more than 10% in surplus sugar state like Uttar Pradesh, Maharashtra and Karnataka.

In concluding remarks, Mr. Shivajirao Deshmukh emphasized that distillery capacity is limiting factor

in successful implementation of EBP and GoI should help sugar mills for increasing distillery capacity by providing financial & policy support. He highlighted that production of ethanol from sugarcane juice/syrup will be profitable if pollution board allows the industry to use land application for effluent disposal. Finally, he concluded the webinar with vote of thanks. Overall co-ordination and moderation of webinar was conducted by Mr. AN Jamadar, Mr. VP Ghule and Mr. Sagar Bramhe.

## 45<sup>th</sup> Foundation Day



Lighting the lamp by Mr. Shivajirao Deshmukh, DG, VSI on the occasion of 45<sup>th</sup> Foundation Day of VSI

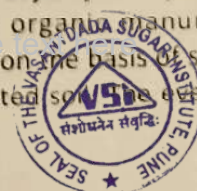
VSI celebrated 45<sup>th</sup> Foundation Day on November 19, 2020. All Head of Divisions/Sections gathered at Board room. On this occasion, Mr. Shivajirao Deshmukh, Director General, lighting the lamp. On this occasion, Mr. Vikas Deshmukh, Director, AST and all Heads of Divisions/Sections were present.

## World Soil Day

World Soil Day (WSD) is held annually on 5<sup>th</sup> December as a means to focus attention on the importance of healthy soil and to advocate for the sustainable management of soil resources. Soil science section celebrated the World Soil Day on December 8, 2020 under the theme 'Keep soil alive, protect soil biodiversity'.

Mr. Vikas Deshmukh, Director, AST, Dr. BD Bhakre, Head, Department of Soil Science and Agriculture Chemistry, MPKV, Rahuri, and all head of section and staff of Agriculture were present. Total 70 participants from 22 sugar mills and farmers were present online for this event.

Dr. Preeti Deshmukh welcomed the guest and all the participants and briefed the importance of world soil day. Mr. Vikas Deshmukh, focus on the integrated nutrient management practices for sustainable soil fertility and cane productivity. Dr. BD Bhakre delivered the lecture on '*Shashwat oos utpadanasathee jamin aarogya aani eakaatmik annadravye vyasthapan*'. He briefed the importance of organic manure, application of chemical fertilizer on the basis of soil testing, reclamation of salt affected soil. The event concluded with vote of thanks.



*Vikas*

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**EVENTS****Online Workshop on M.Sc. (WBAT) Part II Syllabus Restructuring**

Alcohol Technology & Biofuels Department of Vasantdada Sugar Institute, Pune organized an online workshop on "M.Sc. (WBAT) Part II syllabus restructuring" 1<sup>st</sup> July 2020. The workshop was sponsored by Savitribai Phule Pune University, Pune.

Dr. GR Pathade, BoS, Chairman, Dr. Bhushan Choudhari (BoS Member, North Maharashtra University, Jalgaon, Dr. RB Patwardhan (BoS Member), Dr. Bhushan Choudhari, Dr. Ashish Wani (New Arts & Science College, Ahmednagar), Mr. Rashresh Bacchav (Invitee, Gargi College, Nashik) and Dr. SV Patil, Head & Technical Adviser, Department of Alcohol Technology & Biofuels (ATB) and faculty members of ATB Dr. KS Konde, Mr. RV Godage, Mr. AB

Deshmukh, Mr. RV Burase and Mr. VP. Ghule were present.

Dr. GR Pathade inaugurated the workshop and gave brief introduction on the MSc. Wine, Brewing & Alcohol Technology (WBAT) Part-II syllabus. Dr. SV Patil gave brief introduction of the updated syllabus of M.Sc. (WBAT) Part II. In this workshop various issues related to teaching were discussed. The workshop concluded with vote of thanks by Dr. SV Patil. He thanked to Prof. MG Chaskar, Dean, Faculty of Science & Technology, SPPU and Dr. GR Pathade for their valuable guidance and suggestions to organize the workshop. He thanked the BoS members, invitees and all the participants for their active participation.

**The 30<sup>th</sup> Institutional Bio-Safety Committee (IBSC) at VSI**

The 30<sup>th</sup> meeting of Institutional Bio-Safety Committee (IBSC) of VSI was held on 11<sup>th</sup> August 2020 through webinar under the chairmanship of Mr. Shivajirao Deshmukh, DG, VSI in presence of Dr. P Suprasanna, Head, FPBS, NABTD, BARC, Mumbai and DBT nominee, Dr. Vidya Gupta, Emeritus Scientist, NCL, Pune, Dr. SK Raut, Consultant Doctor & Member, Mr. Vikas Deshmukh, Director, AST, VSI, Dr. K Harinath Babu, Senior Scientist, VSI - Member Secretary,

Dr. R M Devarumath, Scientist & Member and Dr. SG Dalvi, Scientific Officer, VSI-Member & Dr. AA Nikam, Scientist, VSI - Member participated in the meeting. In this meeting discussed about various issued related transgenic development in sugarcane work progress, Bio-Safety issues and developing collaborations for developing pest and drought tolerant sugarcane through transgenic approach.

**Congratulation**

Mr. Virdhaval Nalavade was awarded with Ph.D. degree on 5<sup>th</sup> Sept. 2020 in the subject of Biotechnology under the Faculty of Science & Technology from Shivaji University, Kolhapur.

His topic of the Ph.D. work is 'Studies on factors affecting the *Agrobacterium* mediated transformation and development of transgenic sugarcane for abiotic stress tolerance using *SoMYB18* gene'. He worked under the guidance of Dr. K Harinath Babu, Sr. Scientist, Molecular Biology & Genetic Engineering section, VSI.

  
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**Proceeding of the 2<sup>nd</sup> International Conference & Exhibition****On****Sustainability – Innovation & Diversification in Sugar and Allied Industry****Day 1 - Date : 31/01/2020****INAUGURAL FUNCTION**

The 2<sup>nd</sup> International Conference & Exhibition on Sustainability – Innovation & Diversification in Sugar and Allied Industry was inaugurated on 31<sup>st</sup> January, 2020 at Vasantdada Sugar Institute, Manjari-Pune, India.

The event was attended by nearly 2000 delegates from across the country and 100 delegates from other countries. The following dignitaries graced the occasion during the Inaugural Session:

Mr. Sukhjinder Singh Randhawa, Hon'ble Minister for Cooperation & Jails, Punjab State for special guest, Dr. Jose Orive, Executive Director of the International Sugar Organization (ISO,) UK as key note speaker, Mr. Sharad Pawar, Hon'ble President, VSI, honoring this event as the Chief Guest, Mr. Dilip Walse-Patil, Hon'ble Vice President, VSI & Minister for Labour, Maharashtra State, Mr. Jayant Patil, Hon'ble Minister for Water Resource, Maharashtra State, Mr. Balasaheb Patil, Hon'ble Minister for Cooperation & Marketing, Maharashtra State, Mr. Shankarrao Gadakh Hon'ble Minister for Soil & Water Conservation, Maharashtra State, Mr. Satej Patil Hon'ble Minister of State Home (Urban), Mr. Rajendra Yadavkar, Hon'ble Minister of State Public Health & Family Welfare, Mr. Jayprakash Dandegaonkar, President, Maharashtra Rajya Sakhar Karkhana Sangh, Mumbai and Mr. Vivek Pittie, President, Indian Sugar Mills Association (ISMA), Mr. Ajit Chougule, President of Western Indian Sugar Mills Association (WISMA), Members of Board of Trustees and

members of Governing Council of VSI viz. Mr. Vijaysinh Mohite-Patil, Dr. Indrajit Mohite, Mr. Arvindrao Gore, Mr. Kallapanna Awade, Mr. Arun Lad, Mr. Harshavardhan Patil, Mr. Madandada Bhosale, Mr. Ashok Pawar, Member of Legislative Assembly of Shirur, Mr. Chetan Tupe, Member of Legislative Assembly of Hadapsar constituency, Dr. Ashok Dhawan, Vice Chancellor of Vasanttrao Naik Marathwada Krushi Vidyapeeth, Parbhani and Dr. Vishwanatha, The Vice Chancellor of Mahatma Phule Krushi Vidyapeeth, Rahuri were present on dias. Apart from these sponsor exhibitors, delegates', sugarcane industry officials and farmers were present.

Mr. Walse-Patil welcomed all the dignitaries and participants. The dignitaries on the dias inaugurated the event with lighting of lamp and felicitation of distinguished guest and dignitaries on dias. The key note address by Dr. Jose Orive gave the overview of world sugar market. Apart from this he also pointed out that sugar industries diversifying in to green energy and other byproducts is essential for improving sugar industry resilience against commodity cycles and weather.

Mr. Sukhjinder Singh Randhawa talked on present scenario of sugarcane and sugarbeet cultivation in Punjab State.

Mr. Sharad Pawar in his inaugural speech he welcomed all the participants. He briefed the role of VSI and their activities relevant to the evolving needs of the sugar & allied industry and sugarcane growers. He

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emphasized demand of sugar in country by 2025 will be around 30-33 million tonnes. Taking into this requirement of land for food grain crops, there are constraints to increase area under sugarcane cultivation will achieve this demand only by increasing productivity per unit of land by increasing sugar recovery. He also stressed on other challenges assured water, vagaries of monsoon and uncertain behavior of weather this kind of stress contributed to occurrence of pest and diseases. All these issues

need to be analyzed and appropriate measures will have to be taken by scientist, sugar industry policy makers, to thrive profitability for growers and millers. He expressed his wish that the deliberation and discussions in this conference will be benefited to sugarcane growers and sugar industry.

The inauguration event was concluded with vote of thanks by Mr. Dilip Walse-Patil



  
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### Plenary Session I : SUGAR INDUSTRY SCENARIO ACROSS THE GLOBE

The plenary session-I of the program was chaired by Dr. Sushil Solomon, Vice Chancellor, Chandrasekhar Azad University of Agriculture & Technology, Kanpur, U.P., India and Coordinator by Dr. RS Hapase, Principal Scientist, Plant Breeding Department, VSI. In this session following topics were presented by speakers :

- Present status and perspectives of ethanol production in Brazil by Mr. Jaime Finguert, Former Director, CTC, Brazil.
- Beet sugar industry and sugarbeet cultivation in Egypt by Dr. Salah F. Abou Elwafa, Associate Professor of Plant Molecular Breeding and Genetics, Assiut University, Egypt.
- An overview of sugar industry and sugarcane cultivation in Indonesia by Mr. Lilik

Koesmihartono Putra, Director, Indonesian Sugar Research Institute, Indonesia.

- Status of sugar industry in the Philippines by Mr. Terence Uygongco, President, Capiz Sugar Central, Philippines.
- Sugar industry in Sri Lanka by Mr. Keerthipala, Former Director, Sugarcane Research, Sri Lanka.
- Thai sugar industry: 2020 and beyond by Mr. Rangsit Hiangrat, Director General, Thai Sugar Millers Corporation Limited, Thailand.
- Sugar industry scenario in India by Mr. Vivek Pittie, President, ISMA, New Delhi, India.
- Present status of sugar industry in Sudan by Mr. Ihab Abdo Hassan, Farm Manager, Kenana Sugar Company, Sudan



### Technology Providers' Session-I

The session was conducted under the chairmanship of Dr. SV Patil, Head & Technical Adviser, Co-chaired by Dr. KS Konde, Joint Technical Adviser, and Rapporteur Dr. ST Devkar and Mr. RV Burase, Technical Officer, Dept. of Alcohol Technology & Biofuels, VSI, India.

Following speakers participated and presented their company overview and their services to the stakeholders.

- Mr. Dilip Dighe, General Manager, The Maharashtra State Co-operative Bank Ltd. (MSCB), Mumbai, India
- Mr. Bharat Bhusan, Assistant Manager, M/s. Moji Engineering Systems Ltd, Pune, India
- Mr. Miguel Verhein, Executive Director, AquaTuta, Spain
- Mr. Mahendra Gholop, Chief Executive Officer, Universal Forces Industries, Pune, India



  
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- Mr. Narain Madhavan, AGM - New Business Initiatives for Xylem Water Solutions, Xylem Water Solutions India Pvt. Ltd., Bangalore, India
- Mr. Natesan, Senior Manager, Business Development, S.S. Techno Ltd, Pune, India
- Mr. Vaibhav Tiwari, Production Manager, Praj Industries Ltd, Pune, India
- Mr. Roman Rudkowskyj, Deputy Managing Director, Tomsa Destil, Spain

### **Agriculture Session I : SUGARCANE IMPROVEMENT THROUGH BREEDING-BIOTECHNOLOGY FOR ABIOTIC AND BIOTIC STRESS**

Agriculture session-I was chaired by Dr. KP Vishwanatha, Vice-Chancellor, MPKV, Rahuri, Coordinator by Dr. K. Harinath Babu, Sr. Scientist, MB & GE Lab., VSI, Pune India and Rapporteur Dr. JM Repale, Senior Scientist, Plant Breeding, VSI & Dr. SG Dalvi, Scientist, Tissue Culture, VSI.

In this session, Dr. Jagadish Rane, Director, ICAR-National Institute of Abiotic Stress Management, Baramati, Pune, India presented Management of abiotic stress in sugarcane: challenges and opportunities.

Dr. Bakshi Ram, Director, Sugarcane Breeding Institute, Coimbatore, India had given presentation on topic 'Sugarcane breeding In India: prospects and problems' and Dr. Prakash Lakshmanan, Sugarcane Research Institute, GXAAAS, Guangxi, China talked on topic 'Molecular improvement of sugarcane for biotic and abiotic stress tolerance: What have we learned and what is the way forward! He explained that the sugarcane cane yield improvement is very slow and molecular strategies for improving water stress tolerance.

Dr. KP Vishwanatha, Chairman gave concluding remarks and session was concluded with vote of thanks.







Day 2 - Date : 01/02/2020

### Plenary Session- II : GLOBAL SUGAR MARKETS AND ECONOMICS

This session was conducted under the chairmanship of Mr. Arvind Chudasama, Editor, International Sugar Journal, United Kingdom, Mr. Sanjay Khatal, MD, Maharashtra Rajya SSK Sangh Ltd., Mumbai Coordinate the session and Rapporteur Mr. MR Shinde, Sr. Statistician, Statistics & Informatics Section, Mr. VN Pawar, Finance Officer, Finance Section, VSI. Following speakers talked various topics viz.

In this session, Mr. Arvind Chudasama extended warm welcome to all speakers of the session and participants. He presented Present global scenario on sugar production and consumption.

Mr. Prakash Naikaware, , Managing Director, NFCSF, New Delhi, India presented India's continued presence in the global sugar'.

Mr. Ravi Gupta, President (Corporate), Shri Renuka Sugars Ltd., New Delhi, India presented 'Global sugar scenario' that included production, consumption,

export and deficit of major sugar producing countries. He emphasized the benefits of organic sugarcane cultivation and production.

Mr. Mikhail Soroko, Head of Raw Sugar Trading, BH-1206, Geneva, Switzerland talked on a topic 'Recent global sugar price trends: off the lows'. He explained role of Alvean in trading of raw and white sugar globally.

Mr. Kiran Wadhvana, Director, COMDEX INDIA, New Delhi, India presentation on 'World sugar trade' highlighted the importance of raw sugar, having significant share in international sugar trade.

Mr. Rajesh Tope, Governing Council Member of VSI and Chairman, Karmayogi Ankushrao Tope Samarth SSK Ltd., felicitated Chairman of the session and other speakers were felicitated by the Chairman of the session. The session was concluded with vote of thanks by Mr. Sanjay Khatal.

### Agriculture Session II : SOIL RESILIENCE AND SUSTAINABILITY

The session was conducted under the chairmanship of Dr. Ashok Dhawan, Vice-Chancellor, Vasanttrao Naik Marathwada Krishi Vidyapeeth, Parbhani, India and Co-chairman Dr. BD Bhakare, Head, Dept. of Soil Science & Agri. Chemistry, MPKV, Rahuri, India. The session was coordinated by Dr. Preeti Deshmukh, Scientist & Head, Soil Science Section, VSI and Rapporteur were Mrs. JP Kharade, Scientific officer, Soil Science Section, VSI and Mr. BG Mali, Scientific officer, Microbiology Section, VSI

Following speakers presented their topics as, Dr. Takashi Kosaki, President International Union of Soil Science, Faculty of International Communication, Japan presented the topic on 'Site specific fertilizer

management for enhancing sustainability and productivity of soil resources'

Dr. (Ms.) Eleanor Milne, International Coordinator Leicester, Leicestershire United Kingdom delivered a topic on 'Estimating the impacts of agricultural practices on soil organic carbon in tropical agriculture'

Dr. AL Pharande, Dean, Faculty of Agriculture & Director of Instruction, MPKV, Rahuri, India presented a topic on 'Integrated reclamation technology for salt affected shrink-swell soil'.

The session was concluded with the vote of thanks by Mrs. SD Ghodke.



  
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### INAUGURAL OF POSTER PRESENTATION

This session was inaugurated by Mr Sukhjinder Singh Randhawa, Hon'ble Minister for Cooperation & Jails, Punjab State along with Mr. Rajesh Tope, Hon'ble Minister for Health, Govt. of Maharashtra, Mr. Shivajirao Deshmukh DG, VSI and Mr. Vikas Deshmukh, Director, AST, VSI were present. Total 100

posters were displayed in poster presentation area by the scientist and research students from different disciplines of agriculture as well as technology & engineering. The posters were evaluated by the external committee members and they selected following for best posters awards in both areas.

Sr.No.	Title of Poster	Name of Author(s)	Prize
<b>Agriculture Section</b>			
1	Mechanization of sugarcane planting	PP Shinde	1 <sup>st</sup>
2	Earthing up equipment for sugarcane cultivation	PP Shinde	2 <sup>nd</sup>
3	Effect of foliar application of consortium of endophytic fixing bacterial inoculant on yield and quality of sugarcane	MW Pawar, SD Ghodke & PV Ghodake	3 <sup>rd</sup>
<b>Technology Section</b>			
1	Biorefinery process for valorization of sugarcane biomass: from constituents sugars and lignols to value added products	Vishnu Prabhakar Srivastava, Tushar Mishra & Narendra Mohan	1 <sup>st</sup>
2	Hydrothermal Pretreatment Of Sugarcane Bagasse For Biogas Production	Nitin Kumar Agarwal, Madan Kumar, Virendra Kumar Vijay & Vivek Kumar	2 <sup>nd</sup>
3	Head space solid phase micro extraction-gas chromatography mass spectrometry (HS - SPME - GC - MS) technique for determination of volatile compounds in alcoholic beverages	Sukeshani Havale & Sanjay Patil	3 <sup>rd</sup>
4	Reduction in SO <sub>2</sub> emission in sugar production	VP Sidanale, RV Dani, RR Patil & LS Dalvi	3 <sup>rd</sup>



  
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Above awards were given by the hands of Dr. (Ms.) Eleanor Milne, International Coordinator Leicester, Leicestershire United Kingdom and Mr. Jaime Finguerut, Advisor to CTC, Brazil. The poster session

was coordinated by Dr. RM Devarumath, Scientist, MB & GE Lab. VSI along with Dr. Deepali Nimbalkar, Head & Sr. Scientist, Dept. of Environmental Sciences, VSI and other committee members.



### Technical Session I : FACTORY PROCESSING AND ENGINEERING

The technical session-I was conducted under the chairmanship of Mr. DK Goel, Honorary Editor, STAI, New Delhi, India. The session was coordinated by Mr. RA Chandgude, HOD, Sugar Engineering, VSI. Rapporteur is Dr. VP Sidanale, Sugar Technology, VSI and Mr. P. G. Patil, Sugar Engineering, VSI.

During the session following topic were presented by speakers, Dr. Jose Luiz Oliverio, Senior Consultant, Dedini, Matriz, Brazil has presented 'Increase your profit by using sustainable mill technologies - A new reality to Brazilian sugarcane mills'

Dr. Geoff Kent, Principal Research Fellow, Centre for Tropical Crops, Australia has presented talk on 'Latest technologies in sugarcane milling'. Prof. Mohammed Mathlouthi, President, Association Andrew VanHook, Reims, France has presented topic on 'Sugar crystallization and drying - basics and practical aspects'.



Mr. Sanjay Awasthi, President, STAI, New Delhi, India has presented 'Diversification through biofuels and by products in bio-refinery'.

The session was concluded with Vote of thanks by Mr. RA Chandgude.




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### Agriculture Session III : INNOVATION IN MICRO-IRRIGATION AND MECHANIZATION

This session was chaired by Dr. SS Magar, Former Vice Chancellor, Dr. BSKKV, Dapoli, India and Mr. PP Shinde, Head, Agril. Engg., VSI, Pune Coordinated with Rapporteur are Mr. SR Patil, and Ms. MA Gaikwad, VSI.

The following speakers presented their topics; Dr. Felix Reinders, President, International Commission on irrigation and drainage, South Africa presented 'Micro irrigation practices used in different countries'.

Dr. VM Mayande, Former Vice Chancellor Dr. PDKV, Akola, India talked on 'Importance of mechanization in sugarcane cultivation'.

Dr. SS Magar, Former Vice Chancellor, Dr. BSKKV, Dapoli, India presented 'Status and prospectus of micro-irrigation system for sugarcane water management'.

In concluding remarks by chairman, he suggested that VSI, ICAR, Agricultural universities and sugar mills should focus on sugarcane mechanization with automation and robotics in future. The session concluded with vote of thanks.



### Technical Session II : RECENT DEVELOPMENTS IN BIOETHANOL TECHNOLOGIES

The Technical session-II conducted under the chairmanship of Dr. GSC Rao, Managing Director, Global Tech, New Delhi, India. The session was coordinated by Dr. SV Patil, Head & Technical Adviser, Dept. of Alcohol Technology & Biofuels, VSI, Pune, India along with Rapporteur are Dr. KS Konde, Joint Technical Adviser and Mr. DA Patil, Scientist, Department of Alcohol Technology & Biofuels, VSI. In this session following topics were presented by invited speakers; Prof GD Yadav, Former Vice Chancellor, ICT, Mumbai, India presented Biochemical

conversion technologies for advanced biofuels and value added products'.

Mr. YB Ramakrishna, Member- Working Group of Biofuels, Ministry of Petroleum and Natural Gas, New Delhi, India delivered talk on 'New policy on biofuel -2018: Opportunities for the sugar industry in creating bioeconomy'.

Mr. Jaime Finguerut, Advisor to CTC, Brazil presented 'Present status and perspectives of ethanol production in Brazil'.



  
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Mr. Roman Rudkowsky, Deputy Managing Director, TomsaDestil, Spain talked on the topic 'Technical aspects of converting cellulose to ethanol'.

Dr. GSC Rao, Chairman concluded the session with his presentation on 'Ethanol blending program with

dual feed distilleries'. He presented worldwide energy consumption and global ethanol production data. Dr. SV Patil concluded the session with vote of thanks.

### Agriculture Session IV : ADVANCED AGRO-TECHNIQUES FOR SUSTAINABLE SUGARBEET PRODUCTION

This session chaired by Dr. Imad Eujayl, Sugarbeet Molecular Geneticist, USDA-ARS, Northwest Irrigation & Soil Research Laboratory, USA. The session was coordinated by Mr. PV Ghodke, Scientist & Head, Agronomy Section, VSI, and Rapporteur is Dr. AS Patil, Scientific Officer, and Mr. GE Atre, Scientific Officer, VSI.

During the session following Speakers presented their topics; Dr. Salah F. Abou-Elwafa, Faculty of Sugar & Integrated Industries Technology (FIIST), Assiut University, Egypt presented 'Beet sugar industry and sugar beet cultivation in Egypt' Dr. Imad Eujayl, Sugarbeet Molecular Geneticist, USDA-ARS, Northwest Irrigation & Soil Research Laboratory, USA

delivered his speech on 'Applied research Strategies for sugarbeet, drought, heat tolerance and seed production'.

Dr. Timothe Masson, Executive Secretary, WABCG, France delivered his talk on 'Activities of WABCG for increasing sugarcane and sugarbeet productivity'.

Dr. Jean-Noel Evrard, Head of marketing and Communication, SeSVenderHave, Belgium presented the topic on 'Sugar beet seed production for tropical condition'.

Dr. Imad Eujayl, Chairman of the session summarized the session and thanked all the speakers and session was ended with vote of thanks by Mr. P. V. Ghodke.

### Technology Providers' Session-II

The session was chaired by Dr. RV Dani, Head & Technical Adviser, Dept. of Sugar Technology, VSI, and co-chaired by Mr. RA Chandgude, Head & Technical Adviser, Dept. of Sugar Engineering, VSI, Pune, India. Rapporteur is Dr. RN Bhosale, and Mr. SP Nalvade, VSI

Mr. RA Chandgude welcomed all the delegates, audience & technology providers. The following technology providers presented their company profile and activities;

M/s. Ulka Industries Pvt. Ltd., Pune, M/s. S.S. Engineers, Pune, M/s. Privilege Biksons Boilers Pvt. Ltd., Pune / Ahmednagar, M/s. Fives Cail - KCP Ltd., Chennai, M/s. Uttam Energy Systems Ltd., Pune / Ghaziabad, M/s. Triveni Turbine Ltd., Bangalore Maharashtra Energy Development Agency (MEDA), Pune. This session was concluded with Vote of thanks by Dr. RV Dani.



  
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Day 3 - Date : 02/02/2020

### Technology Providers' Session-III

The session was conducted under the chairmanship of Mr. Vikas Deshmukh, Director, AST, VSI, Pune, Co-Chairman, Mr. BH Pawar, Head, Sr. Scientist, Plant pathology Section, VSI, Pune and Rapporteur are Mr. US Manjul, and Dr. MW Pawar, Microbiology section, VSI.

The following speakers participated and presented their company activities;

- Mr. Sudhir Chandna, Regional Marketing Head on behalf of KBK Chem Engineering Pvt. Ltd., a subsidiary of Shree Renuka Sugars Ltd., Athani, Karnataka

- Mr. Govind Misale, Vice-President (Ethanol)
- Mr. Sanjay Jagavkar, Co-founder and Director of Pharmazone Services Ltd., on behalf of The Maharashtra State Chemists & Distributors Association, Mumbai
- Mr. Satish Naib, State Manager – Marketing, Indian Farmers Fertilizer Cooperative Ltd., Pune
- Mr. Sanjay Singh, Managing Director, SLAVS AGRO
- Mr. MV Patil, Managing Director of Shree Datta SSK Ltd., Shirol, Dist. Kolhapur

The concluding remark by chairman and session was concluded with vote of thanks.



### Technical Session III : BIOCHEMICAL CONVERSION TECHNOLOGIES FOR ADVANCED BIOFUELS & VALUE ADDED PRODUCTS

The session was chaired by Mr. Pramod Choudhari, Chairman and Managing Director, Praj Industries, Pune, India. Dr. SV Patil, Head & Technical Adviser, Dept. of Alcohol Technology & Biofuels, VSI, Pune, coordinated the session. Rapporteur is Dr. S. Behera, Scientist and Mr. RV Godage, Scientist Department of Alcohol Technology & Biofuels, VSI.

Following invited speakers delivered the talk; Mr. Pramod Choudhari opened the session with his presentation on session theme Dr. Sasisankar Padmanabhan, Associate Staff Scientist R & D, Praj

Matrix, Pune, India presented 'Bioethanol, biofuels and biorefinery opportunity: Market, industry and emerging technologies' Prof. Luuk van der Wielen, Director, Bernal Institute and Bernal Chair Biosystems Engineering and Design, University of Limerick, Limerick, Ireland presented on the topic 'Next Gen Biorefinery development for a profitable, low-carbon economy' Mr. Dharendra Oke, Whole time Director, Mojj Engineering Systems Ltd., MIDC, Bhosari, Pune, India presented 'Least utilization of water and supporting fuel in distillery'.



  
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### Agriculture session V : INTEGRATED MANAGEMENT OF PESTS IN SUGARCANE - NEW PERSPECTIVE

The Agriculture session V was chaired by Dr. SD Sawant, Vice Chancellor, Dr. BSKKV, Dapoli, Ratnagiri, India. The session was coordinated by Mr. BH Pawar, Senior Scientist & Head, Plant Pathology Section, VSI, Pune. Dr. GS Kotgire, Scientist and Dr. TD Shitole, Scientific Officer VSI were Rapporteur of the session. The following invited speakers presented their research activities as; Dr. (Mrs.) Chandish R. Ballal, Director, NBAIR, Bengaluru, India presented 'Biological control of sugarcane pests: strategies and challenges'

Dr. RS Viswanathan, Principal Scientist & Head, Plant Pathology, SBI, Coimbatore, India presented 'Impact of climate change on sugarcane diseases and development of new diseases in sugarcane' Dr. SN Sushil, Principal Scientist, Division of Crop Protection, ICAR-IISR, Lucknow, India delivered talk on 'Plant protection regulations with reference to sugarcane in India'.

Dr. SD Sawant, gave his speech on 'Overview of sugarcane diseases and management strategies' and also summarized the session.





### EXHIBITION AND LIVE CROP DEMONSTRATIONS

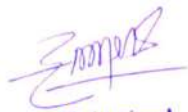
Exhibition area was inaugurated on 31<sup>st</sup> January, 2020 by Mr. Sukhjinder Singh Randhawa, Hon'ble Minister for Cooperation & Jails, Punjab and Mr. Shard Pawar along with other dignitaries. They visited live crop demonstration area and exhibition area comprises of Prime Conference Sponsor (01), Conference Sponsor (06), Platinum Sponsor (15), Diamond Sponsor (02), Gold sponsor (15), Silver sponsor (45), Stall Sponsor (3m X 3m: 60), Stall Sponsor (2m X 2m: 39) Open Stall Sponsor (12) participated. Apart from this advertisement of full Page & Half Page (50) were given in the souvenir book and sponsor for food/catering were also contributed in this event. In the exhibition area sponsor displayed their products and their activities.

VSI displayed the live sugarcane crop demonstrations with different plots of sugarcane varieties, performance of tissue culture raised plant, bio-stimulator performance plots in different crops including sugarcane comparison with control plants, drip irrigation plots, Performance of micronutrient, macronutrient, bio-inoculants etc. and intercropping with sugarcane plots were demonstrated. VSI Stall was exhibited with all the information and activities were displayed for visitors. More than 1.2 Lakh visitors visited the exhibition and crop demonstrations area during the conference.



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### Wildlife Week

On the occasion of wildlife week, Department of Environmental Sciences had organized two invited lectures. Of these, the theme of first lecture was use of modern equipment for wildlife monitoring (e.g. animal tracking system, etc). It was held on October 01, 2019 and delivered by Mr. Dnyanesh Rathod. He was associated with Wildlife Institute of India and worked on project related to monitoring of tigers. Students were amazed while observing the slides and videos related to use of camera traps, GPS and collar ids, etc in monitoring or tracking tiger. He also explained the application of collected data using these tools in preparation of conservation and management plan. Towards the end of the presentation a tool called 'range finder' was demonstrated to students by him. The second invited lecture was uniquely themed on ethno-ornithology; i.e. use of birds by different tribes

in traditional way. Dr. Vinayak Chavan, faculty at Fergusson College, Pune delivered this lecture on October 05, 2019. He is an academic visitor to Edward Grey Research Institute of Field Ornithology and Institute of Human Sciences, University of Oxford, United Kingdom for collaborative work on Ethno-Ornithology in Western Ghats. He presented field observations from Tamhini area of Pune district of Western Ghat. In the presentation, he explained various services offered by bird species to forest dwellers and thus, students realized the importance of avian (bird) diversity in day-to-day life. He also shared views on research opportunities in wildlife. In the post presentation discussion, few students expressed their willingness to pursue research in wildlife related theme. In response, he happily agreed to guide students based on individual proposal.

### 44<sup>th</sup> Foundation Day of VSI

VSI celebrated 44<sup>th</sup> foundation day on November 19, 2019 under the chairmanship of Mr. Dilip Walase-Patil, Vice President of VSI. Prof. Dr. Shivajirao Kadam, Chancellor Bharati Vidhyapeeth Pune was the Chief Guest of the function. Dr. Vijay Pol Sharma, Chairman CACP and Dr. Pande, Adviser CACP both were present as special guests. Dr. Indrajeet Mohite, Shri. Ashutosh Kale, members of Governing Council of VSI, Dr. DG Hapase Ex. Director VSI and Mr. US Indalkar officer from Sugar Commissioner Office Pune were also present.

All the dignitaries were welcomed by Mr. Shivajirao Deshmukh, Director General VSI. The event was formally inaugurated by Chief Guest Dr. Shivajirao Kadam by lighting the traditional lamp along with other dignitaries. Director General VSI introduced the Chief Guest and all dignitaries to the gathering consist of Scientists Technical Personnel's, other staff members and Students. Vice- President VSI briefed the R & D activities of VSI. Chairman CACP elaborated about the cost & prices of Agriculture commodities especially Sugarcane and Sugar products.



  
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## WORKSHOP WORKSHOP

### Use of sugarcane juice/syrup, B-Heavy molasses and sugar for enhancement of fuel ethanol production and recent advances

One-day workshop entitled 'Use of sugarcane juice/syrup, B-Heavy molasses and sugar for enhancement of fuel ethanol production and recent advances' was jointly organized by the Department of Alcohol Technology and Biofuels, VSI and MRSSK Sangh Ltd., Mumbai at VSI on 28<sup>th</sup> August, 2019 with the active participation of sugar mills and distilleries from Maharashtra, Gujarat, Andhra Pradesh and Madhya Pradesh.

In the inauguration function, Mr. Shivajirao Deshmukh, DG welcomed guests Mr. Annasaheb MK Patil (President, Indian Federation of Green Energy and Ex-Minister, Gol, New Delhi), Dr. Sanjay Kumar Bhosale (Director-Byproducts, Commissionerate of Sugar, GoM), Dr. Ketki Bapat (Scientist-F, Office of Principal Scientific Adviser, Gol, New Delhi) and Mr. Sanjay Khatal (Managing Director, MRSSKSL, Mumbai) and felicitated. In his welcome address, he highlighted the present problems being faced by the sugar industry as well as the scope, perspective and vision of ethanol production using sugarcane juice/syrup, BH molasses and sugar.

Introductory remarks were given by Dr. SV Patil, Head and Technical Adviser, Department of Alcohol Technology and Biofuels, VSI. He described the objectives and agenda of the workshop. He emphasized on the importance of the ongoing workshop and developing an affordable technology for ethanol production using the white sugar, juice/syrup and molasses.

Dr. Sanjay Kumar Bhosle informed about the current status of ethanol blending policy. He also highlighted the reasons of inability of sugar mills to meet the demand of ethanol requirement. Dr. Ketki

Bapat delivered a speech on working principles of PSA to GOI and about the rural technology action group. She explained that VSI is able to find the gaps and has come out with technological solutions on pre-clarification of molasses and potash recovery from the incineration boiler ash. The key note address was given by Mr. Annasaheb M.K. Patil who emphasized on the current status of climate change and environmental pollution issues and further generation of ideas for bioethanol production from different bioresources and alternate raw materials. He explained his ideas on the production of ethanol from bamboo, sugarcane juice and molasses that can fulfill the aim of biofuel policy. He further explained about the difficulties being faced by the sugar industry and told that all sugar mills should aim to generate ethanol and other value-added products using molasses, raw sugar and distillery waste.

During the 1<sup>st</sup> technical section, Dr. SV Patil, gave a presentation on 'Cost economics of ethanol production from sugarcane juice/syrup B-Heavy molasses and sugar'. He emphasized on Indian and world sugar balance sheet, ethanol demand and price trend. He also mentioned that there is substantial opportunity to produce ethanol directly from sugar or juice/syrup or B-Hy molasses or C molasses which can fulfil the future ethanol demand as per the biofuel policy.

Dr. KS Konde, Joint Technical Adviser, VSI gave a presentation on 'Evaluation of pilot scale plant performance of pre-clarified molasses to improve alcoholic fermentation'. He explained about the lab-scale technology of pre-clarification developed at VSI and further results of the pilot-scale plant installed at M/S Daund Sugar Distillery Ltd.



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Mr. RG Mane, Secretary, Ethanol Association of India, talked on 'Demand and supply status of ethanol in India'. He explained about the Government policy on ethanol from 2002 to 2019, ethanol demand, ethanol quantity contracted by the OMC's and achieved blending ratio.

During the 2<sup>nd</sup> technical session, Mr. Avinash B. Deshmukh, Technical Officer gave a presentation on 'Potash recovery from incineration boiler ash'. He informed that VSI has developed the technology for potash recovery from incineration boiler ash on laboratory scale and further development to scale up this technology is in progress. Mr. DM Vare, Distillery

Manager, Loknete Sundarraoji Solanke SSK Ltd. gave a presentation on 'Practical experience and advantages of ethanol production from B-Heavy molasses route'. Mr. SA Patil, Scientist, VSI gave a presentation on 'Ethanol production from white sugar or raw sugar'. He explained that sugar can be used to produce ethanol with addition of molasses and press mud cake as the nutrient supplements. Dr. VP Sidnale, Senior Sugar Technologist, VSI and Mr. RV Godage, Scientist gave a presentation on 'Monitoring and certification of ethanol production from sugarcane juice and B-Heavy molasses'. In the concluding sessions, discussions were held and the event concluded with vote of thanks.



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## World Biofuel Day

The Department of Alcohol Technology & Biofuels, VSI, had organized 'World Biofuel Day' on 10<sup>th</sup> August 2019 an interactive session for students of Alcohol Technology and M.Sc. (Wine Technology). This interactive session was conducted to create awareness about the importance of non-fossil fuels as an alternative to conventional fossil fuels and to highlight the impact of all fuels on the environment and various efforts made by Government of India to promote the biofuel sector.

Dr. SV Patil, Technical Advisor and Head, Department of Alcohol Technology & Biofuels, welcomed all the students. He started his discussion with introduction to renewable and non-renewable sources available on the earth. He focused on first, second and third



generation of Biofuels. He also informed that Govt. of India has taken significant steps in the field of Biofuels. He also talked about the Government initiatives on CBG (Compressed Biogas) for its production and usage as a clean and cheaper mode of fuel. CBG plants with the use of agricultural residue, cattle dung and municipal solid waste will provide an additional revenue source to farmers and job opportunities.

On this occasion, Dr. KS Konde informed about the upcoming technologies and forecasted the future development in the field of biofuel industries. Dr. Shuvashish Behera explained terminology of food to fuel ratio and different biomass which can be utilized to produce biofuel. The event concluded with vote of thanks.

## VSI Committee Meetings

On 18<sup>th</sup> August, 2019 Investment Committee and 29<sup>th</sup> August, 2019 Governing Council Meeting was held at VSI. In the GC meeting Dr. RS Hapase, Principal Scientist presented the review of flood affected sugarcane crop in front of committee member's viz.,



Hon. President Mr. Sharad Pawar, Mr. Dilip Walse-Patil, Vice-President, Mr. Shivajirao Deshmukh, DG, Mr. Vikas Deshmukh, Director, Agricultural Sciences & Technology and Members of the Governing Council were present.



  
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## Recent Developments in Environment and Safety in the Sugar and Allied Industry

The significance of environment and safety in industrial operations cannot be overemphasized, more so in sugar and allied industry. The industry is the backbone of the rural economy yet in recent times it has been the focus of criticism over excessive water usage and water pollution. There have also been incidences and accidents which point to the lack of adequate industrial safety. Such incidences have also caused environmental concern. Recently, there have been new notifications regarding environmental clearance for sugar and distillery projects vis-a-vis the National Biofuels Policy as also the use of groundwater (CGWA). These will have an impact on the sugar and distillery industry.

Considering the above, a one-day awareness workshop on 'Recent developments in environment and safety in the sugar and allied industry' was organized at Vasantdada Sugar Institute on 25<sup>th</sup> February 2019. Dr. Amol Deshmane welcomed all the guests and requested the Director General welcomed the Chief Guest, Mr. Shekhar Gaikwad (Sugar Commissioner). This was followed by an introduction to the theme of the workshop by Dr. Deepali Nimbalkar and an address by Mr. Shivajirao Deshmukh, DG, VSI which focused on the significance of environmental issues for the industry and VSI's role in approaching them. Mr. Shekhar Gaikwad, in his inaugural address, advised the environmental officers to work with dedication and follow every norm strictly to minimize the impacts due to sugar industry and distilleries. He suggested making a pollution inventory



for sugar and distillery industry along with regular self audits & third part audits once in three years.

This workshop was arranged in two sessions, Technical Session I- Safety & Technical Session II- Environment. Mr. Isak Mujawar gave the first talk on general safety guidelines for the sugar and distillery industry (including HIRA). He explained the terms as Hazard, Risk and how to identify and control hazard as well as risk. He suggested setting up an emergency exit plan for worker's safety. The second lecture on PESO Guidelines for ethanol storage was delivered by Mr. Prakash Patil who explained The Petroleum Act, 1934 and Rules, 2002, in detail with the rules for import, transport & storage of petroleum and also the criteria for license. The final presentation in this session was made by Dr. Eknath Alhat, VSI who elaborated on the safety issues in Effluent Treatment Plants.

In the second session on environmental issues, Dr. SV Patil, Head & Technical Advisor, Dept. of Alcohol & Bio-fuels explained the various alternatives available to the distillery industry for achieving zero liquid discharge. The final talk was delivered by Dr. Deepali Nimbalkar on recent EIA Notification and its implications for sugar and distillery industry. She explained in detail about the notifications pertaining to the distilleries regarding fuel ethanol projects as also the EIA notification on violation projects. She also enlightened briefly about the draft notification regarding extraction of groundwater.

The workshop received a very good response with 79 participants who were active in the deliberations. All

the speakers received several questions which were answered to the satisfaction of the participants. Many participants requested VSI to arrange such workshops twice a year, so that they remain updated and it helps



to follow specific process and implementation of norms to take care of environment and to improve the status of mills as well as workers. The workshop ended with vote of thanks by Mr. Vivek Patil



  
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## SEMINAR SEMINAR

### United States of America work Experience Programme in Wine

The lecture entitled 'United States of America work experience programme in wine' by ProLearn India was arranged by Department of Alcohol Technology & Biofuels on 14<sup>th</sup> January, 2019 for the M.Sc. (WBAT) course students.

Dr. SV Patil, Head & Technical Adviser, Department of Alcohol Technology & Biofuels introduced Mr. Nitin Thakur, Director, ProLearn India and Ms. Pallavi Godase, Director, ProLearn India to the students. Dr. Patil explained the scope and opportunities to acquire training in USA in wine sector for the M.Sc. (WBAT) students.

Mr. Nitin Thakur briefly presented the concept of USA winery work experience programme. He also shared practical experience of few Indian students who worked in vineyards and winery in USA, acquiring new skills and getting more exposed to wine making involving grape handling, fermentation tank operations, post fermentation operations, on-job training etc. Interested Indian students can get training under approved and qualified Host Trainers of vineyard and wineries in USA. He also provided guidance to the M.Sc. (WBAT) students regarding enrolment, application, selection, visa process etc. The session ended satisfactorily with question & answer and queries raised by the students.



  
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## SEMINARS / TRAINING SEMINARS / TRAINING

### Art of Brewing

One day seminar was organized on **'Art of Brewing'** by the Department of Alcohol Technology & Biofuels, VSI in collaboration with Weyermann specialty malting company, Germany and Fermentis, France on **19<sup>th</sup> April 2018**. Mr. Pradeep Verma, Techno-commercial Associate, Weyermann, Mr. Sanjeev Nagpal, Director, Om Distributor, Gurgaon and Brewers & associates of Om Distributors and Mr. Krishan Kumar Rajeev, Sales Manager, South & South East Asia, Fermentis, France participated in this event.

First presentation of session-I was made by Mr. Pradeep Verma on **'Finest Weyermann Distillates Produced from Weyermann Malt Extracts'**. Mr. Verma explained the process of production of whisky and other spirits using malt extract and further gave information on various malt extract and malt based colour additives which can be used in distilled spirit production.

Mr. Pradeep Verma in his 2<sup>nd</sup> presentation on **'Authentic Weyermann Terroir Malts and the Brewing of Classic Lager Beers'** gave a brief account of brewery terroir malts and also discussed the recipe of lager beer using Weyermann malts. He also covered some points on recipe

formulations and characteristics of lager beer. The 3<sup>rd</sup> presentation was made by Mr. Krishan Kumar Rajeev on the topic **'Cider Production and Yeast Nutritional Requirement'**. He described the process of cider production from apples and discussed steps involved in cider production, types of ciders and varieties of apples used for cider production. Mr. Krishna further gave information on nutrient supplements for production ciders and meads.

In post lunch session, Mr. Verma delivered a talk on **'Water- Ministry in the Universe'**. He took the audience through spiritual and scientific insights of water. He also discussed on current and future water issues and its impact of global brewing industry. Mr. Verma also talked about the ways of reducing water usage in the brewing industry. Later, Mr. Verma also demonstrated the Bevi-clean glass cleaner for minimum water usage.

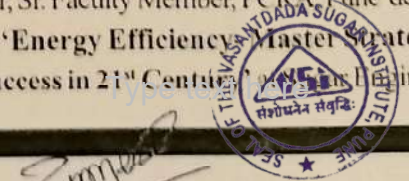
In the concluding session, Mr. Verma and his team had interactions with students regarding their future prospects in brewing and allied alcoholic beverage industry. The staff of the Department proposed a vote of thanks which concluded the function.



### Energy Efficiency-Master Strategy for Business Success in 21<sup>st</sup> Century

As a part of 'Institutional Training Program' on behalf of Petroleum Conservation Research Association (PCRA), Ministry of Petroleum and Natural gas, Govt. of India,

Mr. RL Taylor, Sr. Faculty Member, PCRA- Pune delivered a lecture on **'Energy Efficiency-Master Strategy for Business Success in 21<sup>st</sup> Century'** Engineering



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the speakers received several questions which were answered to the satisfaction of the participants. Many participants requested VSI to arrange such workshops twice a year, so that they remain updated and it helps

to follow specific process and implementation of norms to take care of environment and to improve the status of mills as well as workers. The workshop ended with vote of thanks by Mr. Vivek Patil



## Valorising waste (vWa) from Sugarcane Industries via Innovations in Pre-treatment, Bio-production and Process Intensification

One day awareness workshop on 'Valorising waste (vWa) from sugarcane industries via innovations in pre-treatment, bio-production and process intensification' was held on 5<sup>th</sup> March 2019 at Vasantdada Sugar Institute (VSI), Department of Alcohol Technology & Biofuels.

Total participation in the workshop was about 120 including VSI staff. In Inauguration Ceremony, Dr. SV Patil, Head, and Technical Advisor, Department of Alcohol Technology & Biofuels welcomed all the guests, vWa partners, industry representatives and VSI staff. Mr. Shivajirao Deshmukh DG, felicitated

Dr. Indrajeet Mohite, Prof. Vivek Ranade, Mr. Vijaykumar Goel, Prof. Vivek Kumar and Prof. Yogendra Shastri present on the dais. Introductory remarks on vWa project were delivered by Prof. Vivek Ranade. He explained the basic concept to valorize these wastes into biogas, lactic acid, succinic acid and bio-butanol.

Mr. Shivajirao Deshmukh, in his In his inaugural speech, congratulated Prof. Ranade for his vision in formulating a very innovative project and offering a great opportunity to VSI for leading the vWa project from India side. He elaborated on activities conducted by VSI for the sugar and allied industry as well as footprint







of VSI on entire sugar industry in India. He also introduced Dr. Indrajeet Mohite to audience and his contribution in the area of sugar and allied industries.

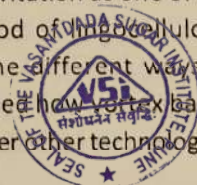
The key note address was given by Dr. Indrajeet Mohite, Chief Guest, explained about the economics of sugar industry and its socio-economical contributions in developing schools, colleges, hospitals and creating jobs in rural India. He mentioned that alternative products can come out from vWa project which will boost entrepreneurship, rural economy, employment and provide additional source of revenue to farmers and sugar industry. He advised the industry as well as vWa project partners to follow the environmental norms to save the mother earth. He thanked Department of Biotechnology, Government of India and Innovate UK for funding the vWa project and Prof. Ranade, Queen's University Belfast, UK for his initiative and effort taken in formulating the vWa project.

In technical sessions-I were chaired by Dr. Indrajeet Mohite. The first presentation on '**Valorizing waste from sugar & allied industries via innovations in pretreatment, bio-transformations and process intensification**' was delivered by Prof. Vivek Ranade. He emphasized on quantum of waste generated by sugar industry and distilleries in India. He also mentioned about the sub-optimal utilization of these waste/resources though current practices like burning of cane trash, use of bagasse for cogeneration etc. He then briefed the concept of vWa biorefinery where cavitation and anaerobic digestion (AD) will be used as pretreatment as opposed to use of costly enzymes in 2 G ethanol technologies. He further added that AD will utilize hemicellulose (xylose) in lignocellulosic material for biogas production and the sugar/glucose released from cellulose will be fermented to lactic acid or succinic acid or biobutanol. Lignin can be valorized to multiple products like DNF, HMF etc or incinerated in boiler for steam and power generation.

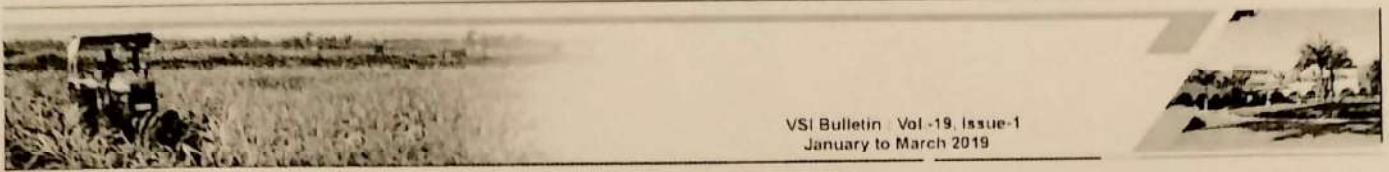
He also briefed about vWa partners and their role in carrying out this project.

The second technical presentation was delivered by Dr. SV Patil on '**Value added products from waste biomass and SATAT initiative**'. He talked about the global initiatives taken by the different countries for biogas production. He also mentioned that the number of biogas plants in Germany has doubled to ~9000 plants from 4136 plants in 2010. He also informed that Oil Marketing Companies (OMCs) have invited Expression of Interest (Eoi) from Entrepreneurs/co-operative societies/technology provider for production & supply of compressed biogas (CBG) and discussed about Ministry of New and Renewable Energy has notified Central Financial Assistance. Further he explained as the distillery biogas plant generally operates 250 days per annum, CBG production plant will run only for 250 days with available spent wash. Therefore, he suggested alternative feedstock such as bagasse, press mud, cane trash etc can be co-digested along with spent wash or digested separately in existing digester for remaining 115 days. Dr. Patil presented three case studies for CBG production and its revenue generation. Dr. Patil presented the lab data on compositional analysis of different sugarcane bagasse cultivars and lactic acid fermentation from synthetic and alkali pretreated bagasse. In conclusion, he mentioned that every sugar mill in country will have CBG plant in future.

In technical session-II, Prof. Ranade talked on '**Enhancing biogas yield via novel pre-treatment**' and presented vWa biorefinery stage I approach which is about utilization of bagasse, press mud and/or cane trash in a digester for biogas generation and digestate generated will be used for bio-composting. He described the hydrodynamic cavitation as one of the potential pretreatment method of lignocellulosic biomass. He also described the different ways to generate cavitation and explained how vortex based cavitation (VoDCa) is superior over other technologies.







He informed that VoDCa is a patented process technology innovated by CSIR-NCL and licensed to Vivira Process Technology, Pune for commercialization. He presented biogas generation data on existing commercial scale spentwash digester with cavitation & without cavitation. At the end, he concluded that vWa biorefinery stage I will be implemented commercially with the technology developed by the vWa and commercial scale trials will start in next three to six months.

The next presentation of this session was given by Mr. Ashish Nawade from Innovative Environmental

Technology Pvt. Ltd. (IETL). He presented technologies for H<sub>2</sub>S and CO<sub>2</sub> removal from biogas so that it will fulfill OMCs norms for CBG. He provided the details of CBG plant installed by ITEL at Tatyasaheb Kore Warana SSK, Warnananagar with power generation of 50KW/h.

At the end, an open, interactive session with the industry participants was carried out where lot of deliberations took place on value addition from sugar and allied industry waste.

### Quarterly Review of Promotional Cane Development Award Scheme (CDAS)

A one day workshop on 'Quarterly review of promotional cane development award scheme (CDAS)' was held on 23<sup>rd</sup> March, 2019 under the chairmanship of Mr. Vikas Deshmukh, Director, AST and the welcome address was given by Dr. RS Hapase which was followed by the lightening of lamp and the introductory speech by Director, AST. In his speech he highlighted the importance of scheme components i.e. seed, planting planning and harvesting programme; soil fertility management and drip irrigation. Total 85 participants from 45 sugar factories were attended the workshop. Dr. RS. Hapase talked on 'Progress of VSI's promotional award scheme (CDAS) 2017-18'. He highlighted the progress of each participating factory under four different scheme components for achieving higher productivity. The Agriculture Officers of 45 sugar factories talked on the progress of the schemes under their area for the year 2017-18 under this scheme. During the discussion following points were emerged as the following recommendations and concluded with vote of thanks.

1. The management and cane development officer of the participating sugar mills should be serious to implement the CDAS to achieve the higher

cane and sugar yield and have the scope to improve in the remaining period of the scheme.

2. At present the seed replacement ratio of the most of the factories is very low and need improvement to follow the three tier seed programme.
3. The newly developed varieties like VSI 12121 (VSI 08005), CoVSI 03102 and MS 10001 should be included in the planting planning according to their soil and area based response.
4. Soil test based fertilizer application ratio needs to be increased to save the cost on use of fertilizers.
5. To increase the soil organic carbon, the factories should concentrate on maximum use of green manuring and compost application.
6. The bio-fertilizers and multi-nutrients use in sugarcane crop found effective to increase the sugarcane yield, so the present ratio needs to be increased.
7. The use of bio-pesticide and bio-fungicide should be used according to the pest and disease situation in the area.
8. The scarcity of water in most of the parts of Maharashtra during 2018-19 is a serious issue and to overcome the situation the area under

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