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 5th 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 bio-gas, 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

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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 lingocellulosic biomass. He also described the different ways to generate cavitation and explained how vortex based cavitation (VoDCa) is superior over other technologies.

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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_2S and CO_2 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 23rd 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 acthe hieve 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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