Proceedings of the One day workshop on Use of Jute Geotextiles in Civil Engineering Applications and Jute Agrotextiles in Agri-Horticulture and Forestry held in the Vijaya Hall of Hotel Green Park, Vadapalani, Chennai- 600026 on 20.01.2017

Inaugural Session:

The workshop was inaugurated at 10:45 am on 20th January, 2017 in the Vijaya Hall of Hotel Green Park, Vadapalani, Chennai. The one day workshop was organized jointly by the Indian Jute Mills Association (IJMA) and National Jute Board (NJB), Ministry of Textiles, Govt. of India.

Shri Arvind Kumar M, Secretary, NJB in his inaugural speech welcomed the participants and appreciated IJMA’s efforts in organizing the workshop in Chennai to spread awareness on use of Jute Geotextiles (JGT) in Civil Engineering Applications and use of Jute Agrotextiles (JAT) in Agri-Horticulture and Forestry. He referred to the number of field trials where JGT/JAT has been used successfully. The participants were informed by Secretary, NJB about the role of NJB in promoting Jute diversified products which include Technical Textiles made up of jute. While expressing his concerns over climate change, Secretary, NJB requested the participants to come forward for using JGT/ JAT in related application areas where these natural geo/ agro textiles can be found viable for Govt. of Tamil Nadu. The benefits of using Jute Geotextiles as well as other jute products which will help approximately 40 lakh farm families and 2.5 lakh workmen involved in the Indian jute industry were elaborated by him. Secretary, NJB requested all the participants to attend the technical sessions which will provide the requisite insight on the subject and will help the practicing engineers to take a decision regarding using JGT/ JAT in respective application areas.

Shri Raghavendra Gupta, Chairman, IJMA then addressed the participants and informed about the steps taken by jute industry for promoting JGT/ JAT in various North Eastern states under the Ministry of Textiles Scheme for Promoting Use of Geo Technical Textiles in the North Eastern Region. He then informed the dignitaries and the participants that the ongoing workshop in Chennai is a follow of the workshop organized by NJB and Central Soil & Water Conservation Research and Training Institute (CSWCRTI) in October, 2014 in Udhatagamandalam, Ootacamund, Tamil Nadu. The participants were informed about the inclusion of JGT in the respective Schedule.
of Rates of Govt. of West Bengal, Assam and Meghalaya. He also mentioned about the Government Order issued under the signature of the Chief Secretary of Govt. of West Bengal mandating use of JGT in all civil engineering applications, wherever found feasible. He also briefed the participating engineers, technologists and senior Govt. Officials regarding price competitiveness of JGT/JAT vis-a'-vis other types of geotextiles available in India. He expressed the willingness of jute industry to diversify and help the end user in supplying standard quality JGT/JAT products. Regarding Pre-fabricated Vertical Jute Drains (PVJD), Chairman, IJMA informed the participants that the natural variant of synthetic PVD (prefabricated vertical drains) made up of jute and coir is being presently field tested by Australian Research Council (ARC) and Wollongong University of Wollongong, Australia with support of NJB for finding the efficacy of PVJDS in soft soil consolidation.

Shri Hans Raj Verma, Principal Secretary, Rural Development and Panchayati Raj (RD & PR), Govt. of Tamil Nadu as Guest of Honour appreciated the efforts of NJB and IJMA in bringing the end users, manufacturers and policy makers of Govt. of Tamil Nadu on the same platform wherein some important decisions regarding using this eco-friendly product can be taken. He expressed his concern towards pollution and informed the participants regarding Govt. of Tamil Nadu’s initiative of using waste plastic in road construction. While addressing the participants he informed that 1.8 lakh kms of roads have been constructed in Tamil Nadu out of which 10,000 kms have been constructed by using waste plastic. This helped women SHGs who used shredding machines to get employment and also cleared waste plastic accumulation. He requested NJB and IJMA to approach the Forest Department of Tamil Nadu for using JGT in prevention of surficial soil erosion. Expressing the benefits which JGT can provide while being used in river bank protection, Shri Hans Raj Verma suggested that NJB and IJMA should contact Coastal Management Authority of Tamil Nadu and Chennai Port Authority so that these can be used effectively in bank protection works wherein there is a continual rise in sea level.

Shri Rajesh Bhushan, Joint Secretary, Ministry of Rural Development and Director General (DG), National Rural Roads Development Agency (NRRDA), as the next guest of honour addressed the participants. He informed the participants about the salient features of PMGSY scheme and the important work done so far since the launching of the scheme in August, 2000. DG, NRRDA informed the participants and dignitaries regarding the incremental use of Green Technology in rural road construction under the PMGSY scheme. He mentioned that during 2000-2014 about 800
Kms of roads were constructed with green technology in which the share of JGT was less than half percent. In 2015-16, the total stretch of roads constructed with green technology increased to 2000 kms and in 2016 it reached to 3000 kms (approx.) from which the share of JGT increased from less than half percent to 2.5 % to 3%. DG, NRRDA further informed that in 2017-18 and in 2018-19 a total of 13,000 kms of roads will be constructed with green technology. He suggested industry to approach the Indian Roads Congress (IRC) with the help of Ministry of Road Transport and Highways (MoRTH) and Ministry of Textiles (MoT) for codifying JGT in the codes of practice of Indian Roads Congress (IRC). NRRDA being a member of IRC will help JGT to be incorporated in the code of practice of IRC. DG, NRRDA mentioned that NRRDA, Ministry of Rural Development (MoRD) has been encouraging the engineers to come up with new technologies for constructing roads. For these 100% cost for the preparation of Detailed Project Reports (DPRs) will be borne by MoRD. The respective States may need to hire technical agencies (State Technical Agencies) (STA) for various tasks such as monitoring, assistance during implementation of the new technology, etc. The STAs can be IITs, NITs, reputed Civil Engineering colleges or even IJIRA can be made as one of the STAs. The State Govt. can use the funds allocated to it under PMGSY in three phase cycle study of the roads constructed with green technology.

Shri A. Madhu Kumar Reddy, Joint Secretary (Jute) and Jute Commissioner, Ministry of Textiles, Govt. of India, who accepted the invitation to be the Guest of Honour, addressed the august gathering. He, in his inaugural speech mentioned about the Ministry of Textiles’s Scheme of Promoting Use of Geotechnical Textile in the North Eastern Region for which Indian Jute Industries’ Research Association has been designated as the Center of Excellence (CoE) and is helping the end users in the North Eastern States for implementation of the Scheme. He informed that 10% out of the Rs. 427 crore project has been allocated to JGT. He further requested Dr. K. Rajagopala, Professor, IIT Madras, Department of Civil Engineering to team up with IJIRA so that JGT can be codified in code of practice of IRC. In this National Jute Board and Ministry of Textiles will provide necessary help in taking up the matter with MoRTH and CRRI.

Shri G.R. Verma, Vice Chairman, IJMA addressed the participants and briefed them regarding industry’s view point on JGT and JAT. Shri Subhakirti Majumdar, Director General, IJMA in his vote of thanks appreciated the efforts of participating engineers from various engineering departments of Govt. of Tamil Nadu like PWD, Agriculture, Rural Development and Panchayati Raj, Forest and Horticulture for having spared their valuable time for attending the workshop. DG, IJMA further
extended his vote thanks all the three Guests of Honour, Director, IJIRA, Secretary, NJB and to all the participants for attending the workshop.

**Technical Sessions**

**Technical Session-I**

(Cahirman- Dr.K. Rajagopal, Professor, IIT Madras, Department of Civil Engineering)

The first presentation of the Technical Session-I was made by Dr. U.S. Sharma, Director, Indian Jute Industries’ Research Association (IJIRA). Dr. U.S. Sharma in his presentation provided detailed information regarding jute, its unique properties including role & responsibilities of IJIRA as the Center of Excellence (CoE) for the North Eastern Region (NER) under the Ministry of Textiles Scheme for Promoting Use of Geotechnical Textiles in NER. He informed the participants regarding the competitiveness of jute with other natural and synthetic fibres used as technical textiles. The participants were told about the benefits of using eco-friendly materials as geotextiles and agrotextiles. He mentioned that jute can be beneficial to the surrounding environment considering its mulching character which acts as manure after decomposition and helps to accelerate the growth of vegetation.

The second speaker of the session, Shri P.K. Choudhury, Principal Technologist, National Jute Board (NJB), Kolkata in his presentation elaborated the functions of jute geotextiles in road construction, river bank protection, hill slope stabilization and prevention of track settlement of railways. He further covered the use of jute agrotextiles in agro-horticulture and forestry. Shri Choudhury mentioned about the volume of field trials carried out with JGT/JAT in respective application areas. He informed the participants that about 441 kms of rural roads will be constructed in the State of West Bengal with JGT under PMGSY. The participants were informed about the available varieties of jute geotextiles which are being used in civil engineering applications. For strengthening of road Woven 724 gsm JGT, for slope management Open Weave 500, 600 and 700 gsm JGT and for riverbank stabilization Woven 627 gsm JGT are used. He informed the participants from Agriculture, Forestry and Horticulture department of Govt. of Tamil regarding the agro mulching properties of JAT and how its use can lead to weed suppression. Elaborating the benefits of jute geotextiles he mentioned the environmental advantages of JGT,
vegetation growth and enhancement of hydraulic conductivity of soil, which improves soil quality. JGT can absorb water about 5 times its dry weight creating congenial microclimate ensuring quick growth of dense vegetation.

Dr. K. Rajagopal, Professor, IIT Madras, Civil Engineering Department, presented his work done in civil engineering application with coir geotextiles. He requested for samples of Pre-fabricated vertical jute drain (PVJD) for laboratory and field studies. Dr. Rajagopal expressed his interest in carrying out further work with jute geotextiles and mentioned about the future prospects of using natural geotextiles in improving soil characteristics like CBR (California Bearing Ratio), Maximum Dry Density (MDD), effective stress and shearing resistance. He requested the practicing engineers of various engineering Departments of the Govt. of Tamil Nadu to come forward and use natural geotextiles in civil engineering applications with a special thrust to protect the environment. He also motivated the participants for using natural/jute geotextiles in agro-horticulture and forestry.

The fourth speaker, Miss Rumki Saha, Technical Officer, IJIRA presented the topic on Use of JGT in road construction and River Bank Protection and its economical benefits. She briefed the participants about the various steps by which jute geotextiles can be helpful in road construction and riverbank protection. The advantages of using JGT in road construction like reduction of maintenance cost and uniform riding profile were explained by her. She presented case studies of using JGT in road construction and river bank protection work carried out by NJB under the international project funded by the CFC.

Shri Koushik Das, Scientist, IJIRA, as the fifth speaker, gave information regarding the steps for installation of JGT in road construction, hill slope stabilization and river bank protection. He also explained the steps for storage of JGT at site.

Technical Session-II

Chairman- Shri P.K. Choudhury, Principal Technologist, National Jute Board, Ministry of Textiles, Kolkata

As the first speaker in the afternoon Technical Session, Ms Sunanda A, Technical Assistant, Karnataka Rural Roads Development Agency (KRRDA) made her presentation on Roads Constructed with JGT in Karnataka. She informed the participants about 113.59 kms of roads (23
roads) constructed in 8 districts of Karnataka with JGT and mentioned about the use of JGT in black cotton (BC) soil where lime was used for improving the sub-grade soil. She informed about the good performance of the road stretches wherein JGT was used. She further informed about the performance evaluation of the roads which was carried out by Prof. Manjunath, UMBT, Karnataka and mentioned that no control section was evaluated vis-a'-vis with JGT used section. She confirmed about the better performance of roads of Karnataka constructed with JGT by providing data related to increased load carrying capacity of the respective road stretches.

Dr. S. Manivannan, Principal Scientist, IISWC, Regional Centre, Udhagamandalam gave a presentation on Application of jute geo-textile for hill slope stabilization using tea and grass as test crops. He presented the results and findings of prototype field study conducted at CSWCRTI Research Centre, Udhagamandalam. He stated that jute geo-textiles out performed over control plots in all the cases. Though there was difference in the performance of JGT on reduction runoff and soil loss, there was no significant difference within different types of JGT on crop growth. However, keeping in view the economical benefit, 500 gsm open weave JGT is better for Tea establishments. Interim results of the prototype type field study on use of JGT for slope stabilization with 60 and 90 % slopes, showed that the 500 gsm open weave jute geo-textiles and non woven JGT outperformed synthetic geo-textiles and control. The root growth and soil binding characters of the grass were better under open weave jute geo-textiles.

Dr. Goutam Bose, Principal Scientist, National Institute of Jute and Allied Fibre Technology (NIRJAFT), Kolkata, the third speaker of Technical Session-II gave his presentation regarding use of jute agrotexmiles (JAT) in agriculture and forestry. He mentioned that the use JAT increases the nutrient content of soil and also regularizes the temperature of top soil above which is used for better mulching effect and vegetation.

Shri Saurabh Ganguly, Secretary and JGT Marketing Head, Indian Jute Mills Association (IJMA), as the last speaker of the Technical Session –II described about the role of IJMA in promoting JGT/JAT in various States and informed about the steps which, at present, are being taken by the jute industry for supplying the desired quantity of JGT fabric of requisite quality. He further informed about a field trial of JGT in Karbi Langpi District of Assam by Assam Power Generation Corporation Limited (APGCL). The work was jointly monitored by IJMA and NJB.
Valedictory Session

Shri P.K. Choudhury, Principal Technologist, NJB and Shri Saurabh Ganguly, Secretary cum JGT Marketing Head, IJMA answered a few queries raised by the participants. The matter of cost competitiveness was explained by Shri P.K. Choudhury. He informed that 500 gsm open weave JGT fabric which is preferred for hill slope stabilization is about Rs 28 per sqmt (ex. factory) as compared to coir which is around Rs 52 per sqmt. Shri P.K. Choudhury informed the participants that the questions mentioned in the feedback form will be replied through e-mail.

Concluding Remarks

Shri Arvind Kumar M, Secretary, NJB and Shri A. Madhu Kumar Reddy, Joint Secretary (Jute) and Jute Commissioner, Ministry of Textiles concluded the workshop by stating that IIT Madras will be approached by the Ministry of Textiles for taking up the matter of codifying JGT in the code of practices of IRC. Secretary, NJB said that for any clarification regarding use of JGT, National Jute Board can be contacted and the Indian Jute Mills Association can be addressed for requirement of JGT. He also desired that there should be continuous collaboration between National Jute Board, IIT Madras, IJIRA and IJMA in research capacity building and promotion of JGT/JAT in civil engineering applications, agriculture and forestry. Secretary, NJB requested the participants for using JGT/JAT in viable projects.

Secretary, NJB further urged upon all concerned that usage of JGT/JAT should be increased significantly for which he assured the participants technical support and guidance of the technical team of NJB, IJMA and IJIRA, which will always be made available to the end users.

There were a total 94 participants from Public Works, Rural Development and Panchayati Raj, Horticulture, Agriculture, Forest, Water Resources and Highways Departments of Government of Tamil Nadu as well as representatives of Puducherry and Karnataka. The manufacturers, jute industry, also participated in the workshop. Out of 94 participants 8 were from the jute industry.
Lighting the Lamp in Inaugural Session for Workshop on Jute Geotextile at Chennai on 20.01.2017 Organised By National Jute Board (NJB) & Indian Jute Mills Association (IJMA)

Dignitaries on The Dias. From the left Mr. Arvind Kumar- Secretary, NJB, Mr. Madhukumar Reddy-Joint Secretary, Mot, Govt. of India, Mr Rajesh Bhusan-Director General, NRRDA, MoRD, Govt. of India, Mr. Hans Raj Verma-Principal Secretary, P&RD Deptt, Govt. of Tamilnadu, Mr R. Gupta - Chairman, IIMA, Mr. G. R. Verma-Vice Chairman, IIMA
View of the Audience

Speech by Mr Rajesh Bhusan
Speech by Mr. Madhukuam Reddy

Mr. P K Choudhury delivering Lecture on JGT
Ms Sunanda A, delivering Lecture on JGT

Dr. Manivannan delivering Lecture on JGT
Mr Sourabh Ganguly delivering Lecture on JGT

Mr Arvind Kumar delivering Inaugural Speech
A view of the Dignitaries present in the Workshop