

**First National Seminar on**  
**Sustainable Sugarcane Initiative, SSI**  
**A Methodology to Improve Cane Productivity**

**Dates: 24- 25th August, 2011**

**Venue: Freeman Hall, TNAU, Coimbatore, Tamil Nadu**



## **A Report**

Submitted by

**AgSri**

**Agricultural Services Pvt. Ltd.**

Hyderabad

## NATIONAL SEMINAR REPORT ON SSI

### INTRODUCTION

#### Sugarcane Production - Current Challenges

Indian sugar industry anchors 45 million sugarcane growers, cultivating over 42 lakh hectares in India. After rice, sugarcane employs the highest number of labour, of which 60 percent are women. Sugar production this year is estimated officially at 26 - 26.5 million tonnes, up from 24.2 - 24.5 in 2009-10. In 2010-11, sugarcane was planted in 4.98 million hectares across the country. Area under sugarcane in the new crop year that starts in October 2011 is expected to increase by around 8-10 per cent because of good price to growers and relatively favorable weather.

Sugarcane is a versatile crop and is one of the most efficient converters of solar energy into dry matter. In spite of this inherent nature of sugarcane to have high productivity levels, cycles of surplus and shortage are not uncommon and as such, industry in India is facing heavy losses due to various factors. For instance, during the last crushing season ending October 2010, around 300 small and mid-size sugar factories, representing 40 per cent of India's 24.2 million tonnes of sugar output faced a financial crisis due to losses in cane crushing (*Business Standard* Aug. 15 2011). According to this report, the situation is likely to worsen in the ensuing season.

These developments are bound to have an impact on sugar economy of the nation. The loss for the first eight months during the current crushing season, as estimated by India Sugar Mills Association, is Rs. 3,200 crores, at an average of Rs. 400 crores per month. Apart from other necessary interventions like policy initiatives and financial support that are needed, it is imperative to increase the productivity levels of sugarcane if the industry is to come out of the red. The productivity level, on the other hand, shows there has hardly been any improvement over the past 20 years, the average hovering around 67 tonnes/ha, with a high of 76.5 during 1999 and a low of 59.4 during 2004. In spite of significant advances in crop husbandry during these two decades, the cane productivity has remained stagnant.



Some of the reasons for low production and productivity are a) increasing cost of production, b) lack of consistency in price support system, c) lack of sustainable farm practices and innovative production techniques and d) lack of proper extension support. Particularly, the seed cost and cost of fuel for irrigation are estimated to be about 15 percent and 14 percent respectively, of the total cost of cultivation and this is next only to the labour cost at 21 percent. Because of some of the reasons mentioned above, farmers are being forced to switch over to other remunerative crops, making the situation even worse. In order to rescue the farmers and sugar industry from

these predicaments, it is necessary to bring in some major changes in the cultivation practices, especially techniques have to be introduced which help in producing 'more with less'. This is a major challenge and requires concerted efforts with comparable resources – both institutional and financial.

The following are the major issues confronting the farmers as well as the industry today

- Low productivity and low incomes for the growers
- The costs of cane cultivation have risen alarmingly (about 30-35%) for seed/planting material, manures and fertilizers, irrigation, cultural practices and harvesting
- Shortage of labour as traditional practice involves high labour engagement
- Water availability is unpredictable. The concern is not only the quantity of water but absence of proper water management practices leading to wastage of water resources
- Cultivation Methods - the seed rate is 5 to 8 tonnes/ha and in some states it is much more due to close planting (2.5 feet) adopted by farmers which is about 10-20% of the expected yields of sugarcane
- Despite high seed rate, close planting can only support a population of 25,000 canes per acre (due to high mortality while competing for sunlight and nutrients). The average weight of canes is 0.75 kilogram, thus ending up in an yield level of around 60-70 tonnes/ha
- In irrigated areas water is wastefully consumed in large quantities (150 - 300 liters per kg of cane produced) due to flooding method of irrigation causing huge strain on local ground water resources
- Inability of farmers in deploying new harvesting machines owing to closer spacing of seedlings in traditional methods
- The improved varieties released by research institutions perform well in the initial years but lose their vigor and decline in yield in due course.



Given the above situation, any attempt to increase productivity with reduced inputs should be welcome both to the farmers and the Industry. 'Sustainable Sugarcane Initiative' (SSI) is one method that has caught the imagination of all the stakeholders, especially the farmers, because of its proven ability to increase the productivity at reduced inputs. SSI is spreading fast among the Indian farmers with the support of industries, government and civil society organizations given the number of farmers and sugar mills (more than 600 in India); there is a need to scale up SSI. Considering

the importance of Indian sugar industry both for the domestic and international market, SSI has great potential and if adopted on large scale, will play a significant role in the sustainable sugarcane and ethanol production at the global level. Especially, the practices recommended under SSI hold much importance in these times of climate change induced global warming and weather aberrations.

AgSri, Sugarcane Breeding Institute (Coimbatore) and NRMC (NABARD) in pursuit of strengthening and scaling up SSI have come together to promote debates on current approaches to sugarcane production. NABARD, ABI-ICRISAT, Farmer groups, reputed sugar companies, International Finance Corporation, FICCI, Jain Irrigation, Drip Tech (US), civil society organizations and scientists from reputed intuitions in the country, numbering 115 participants, have joined to share their experiences, expectation and chart out a new direction which will enhance collaborative efforts to reach out to sugarcane farmers in the country.

A two days national seminar was organized on **Sustainable Sugarcane Initiative (SSI)** by AgSri, NRMC-NABARD and SBI Coimbatore on 24 - 25<sup>th</sup> August, 2011 at Freeman Hall, Coimbatore, Tamil Nadu. The objective of the seminar was to promote cross learning and debate among farmers, industry, agriculture universities, research agencies, Government institutions and CSO's to mainstream SSI in India.



The programme started with registration of the participants. It was followed by welcome of the participants by Dr. Padmaja. The key guests include Mr. SK Mitra (Executive Director, NABARD), Dr. Vijayan Nair (Director, Sugarcane Breeding Institute, Coimbatore), Dr. D.G. Hapase (Ex-Director, Vasantdada Sugarcane Institute, Pune), and Dr. Biksham Gujja (Chairman, AgSri).

In his keynote address Mr. A.K. Mukhopadhyay, NRMC Kolkata said there is a huge opportunity with the current national seminar to evolve a plan for increasing sugarcane cultivation under SSI keeping in view the reduction of water usage under the methodology. Reiterating commitment to rural livelihoods, he said that NRMC was established to support any such initiatives.

Dr. Biksham Gujja, Chairman AgSri in his welcome address, brought out current crisis in agriculture worldwide despite efforts of government and non-government organizations. The reason is the continued emphasis on using more inputs for increased production, though it worked well in the past. According to him



that time has come for paradigm shift in agriculture production systems to achieve 'more with less'. For that to happen, we need to give practical options to the farmers to get more with less, which calls for transformation from the input oriented agriculture to knowledge-oriented agriculture, wherein our focus should be on knowledge transfer to the farmers. Describing SSI methodology as an evolution of success achieved under SRI (System of Rice Intensification) principles, Dr. Gujja said the team was able to put together a package to apply it for sugarcane cultivation. According to him, the objectives of the seminar evolved through consultations with industry, government, national research institutions and farmers.

### Key Objectives

- Share and learn experiences of SSI methodologies
- Identify the constraints and opportunities based on practical experiences in adopting SSI
- Promote opportunities for scaling up of SSI activities to all sugarcane growing areas in the country
- Provide a common platform for different stakeholders to develop strategies/action plan for scaling up SSI in India

The principal co-host of the workshop Dr. Vijayan Nair, Director, Sugarcane Breeding Institute (SBI), Coimbatore reiterated need to incorporate feedback from all stakeholders who are expected to play a key role in promotion of SSI. The first national seminar must explore further improvements one can make to SSI approaches by documenting farmer experiences. In the light of less availability of land for expansion, efforts should be directed towards vertical expansion, which is possible only through productivity enhancement. In order to make sugarcane cultivation more profitable for the farmers, the cost of cultivation has to come down and SSI offers an opportunity to significantly reduce the cost of cultivation as it is based on the principle of more with less. He also cited various problems being faced by the farmers which include fragile sugarcane production cycle and therefore fluctuating prices, labour availability, climate issues, increasing cost of cultivation and low yields. He observed that while SSI has emerged as a hope which has potential to address some of these issues especially increasing the yield while reducing the cost of cultivation but we need to realize that it is an evolving process and any single process model would not fit in every situation. Therefore, farmers should be presented with a situation based specific solutions.



Addressing farmers and industry, Dr. D G Hapase, Ex Director – Vasandada Sugar Institute, Pune said that sugarcane crop has great potential and he has practically

demonstrated yields as high as 150 tonnes/Ha (under UP conditions). To experience such results, one needs to understand physiological functioning of the plant and study the environmental factors in order to get the best out of it. Underlining the importance of Sugarcane and its potential to provide food as well as energy he said that numbers of sugar industries are increasing every year. There are many technologies available for better yield but it will have its effect only when it reaches to the plant. Talking about the farmers he added that if one analyses the per day income of farmers, taking into account all his expenses, land cost and his own labour, one will come to know that hardly he earns Rs. 3-4/Day with a land holding of 1 Ha. There are many technological developments in the recent years in Sugarcane but these will bring result only when it reaches to the farmer and he applies those in the field. He commended the efforts of AgSri for putting together different better management practices in the form of SSI and also taking it to farmers plot by practically demonstrating the package.



The key government representative from Tamilnadu, Mr. R. Gnanaoli, Deputy Director, Department of Agriculture has said that the state has set aside Rs.25 crore to bring 10000 ha of sugarcane cultivation under SSI. The government is keen to address regional variations with respect to yields though TN is known for having highest cane productivity in the country. The Government is trying to address disparities (five districts registered more than 100 tons per acre where as remaining districts have less than 40 tons per acre yield) and SSI certainly has the potential to provide help in this direction.

Tamilnadu, Mr. R. Gnanaoli, Deputy



### Release of publications

AgSri in collaboration with NRMC has released two important publications, which will help farmers, research institutions and industry to scale up SSI operations. The SSI Manual is an updated version from the first edition released earlier under ICRISAT-WWF partnership and includes new innovations and experiences in SSI. AgSri brought out best practices of farmers from five states in the



form of case studies, which narrates the experiences of farmers in adopting SSI methodology and gives insight into various dimensions of SSI benefits. The two publications are released by, Mr. S K Mitra, NABARD's Chairman, Dr. Biksham Gujja and Dr. Vijayan Nair respectively.

In the post release session, Mr. SK Mitra, Executive Director, NABARD appreciated the efforts of farmers, research institutions and industry in developing and promoting technologies such as SSI and SRI. He remarked that over the period of time these SSI and SRI terminologies would become so popular that people would start knowing them by these names and practicing these technologies would become normative way of doing. He also appreciated Dr. Hapase's observation that harvesting solar energy is agriculture. He shared that among all the objectives of SSI, he is particularly impressed with the water conservation potential of SSI. He also added that up-scaling SSI calls for a mission mode approach. He added that this seminar must come out with broad solutions, which could be adopted by the Government to up-scale SSI in different states. He also stressed on the need to promote farmers participation in value chain rather than just confining them to production to improve farmer profits in the light of new challenges in the form of climate change.



**Ms. Raji Gain, GM, NRMC, NABARD:** Thereafter, Ms. Raji Gain summarized the key points of discussion during the session, which included concerns raised over the issues such as increasing the yield and simultaneously reducing the cost of cultivation, use of inputs especially water, increasing the sugar recovery, appropriate varieties suitable for SSI, seed material, under-utilization of crushing capacity, low mechanization, cropping pattern, micro irrigation system, suitable pricing mechanisms, improving the profitability of farmers and sugar industries, and how do we reach to the farmers with suitable methodologies like SSI, modifications required to suit the local conditions etc. She also thanked Shri Mitra, Dr. Gujja and team, Dr. Nair, Dr. Hapase, NGOs, Govt. representatives, farmers as well as media for making it to the event and valuable role played by them.



## TECHNICAL SESSION I

**Chaired by Dr. DG Hapase and co-chaired by Mr. Balakrishnan**

The first sessions is designed to provide key inputs of SSI approaches including development of seedlings to crop management for enhancing productivity. Inaugurating the session Dr. D G Hapase explained that there is huge potential of productivity enhancement provided we understand and fulfill the plant requirements as per the climatic factors. According to him, that yield depends on two factors namely number of millable canes and average cane weight. Therefore, in order to get better yield the focus should be on these two factors. Recollecting his past experience, Dr. Hapase said he managed to get yield as high as 157 tonnes/ha under Uttar Pradesh climatic conditions. Therefore, it is important to realize that there is huge potential for yield improvement despite adverse climatic factors, provided we experiment, compile the appropriate technological practices and then present them to the farmers. He suggested that successful agricultural farming practices in the farmers' community must be documented and the same shall be translated into different languages and shared with the farmers across the country.

It was followed by address by Dr. Balakrishnan (Ex Director – NABARD) stressed on the need for managerial approach towards farming. According to factual information that the farmer is at risk at every stage and therefore, we need to train, educate, encourage and subsidize for forming farmers organizations on corporate lines so that farmer is able to face these risks and derive optimum benefits. He further added that farming is the riskiest professions in the world. He also shared one example of well performing farmers group in Bihar.

It was followed by these presentations:

1. **SSI – A methodology to improve the yields by Dr. V. Vinod Goud, AgSri:** He shared in detail about the origin of SSI, its key principles and how it provided an opportunity to improve the quality and productivity of sugarcane while reducing the impact on natural resources.
2. **Bud chip nurseries by Dr. Radha Jain, Senior Scientist (Plant Physiology) IISR, Lucknow:** She shared about the history of bud chip technology, methods of raising, results of germination studies, differences between conventional and bud chip method, processes in raising bud chip nurseries and the





relative advantages of bud chip method.

3. **Wide row spacing and drip irrigation in sugarcane by Mr. Stephen Arul, Thiru Arooran Sugar Mills Ltd., Tamilnadu:** He explained about the major components of sugarcane production, and water requirement, ideal spacing, and spacing under different irrigation methods, and farm mechanization.



4. **Tillering in SSI by Dr. US Natarajan, Consultant, AIP-ICRISAT:** He explained the emergence of tillering, factors affecting the same, constraints and solutions with the help of photographs depicting the different stages of tillering. He also presented some of the field observations of tillering under different methods in tropics and subtropics.



5. **Intercropping in sugarcane by Dr. Sivaraman, Principal Scientist (Agronomy), SBI, Coimbatore:** He explained about the scope of intercropping, compatible crops, its effect on main crop, practices to avoid reduction in yield of sugarcane, reasons for low adoption of intercropping practices, experiments, results and the recommendations for intercropping with the help of factual figures.



After the presentation, Chairman for the session, Dr. Hapase thanked everyone and stressed on the need to understand the follow these practices as part of SSI to get even better results with the SSI methodology.

## TECHNICAL SESSION II

### **Experiences, Constraints and Lessons**

The second session of the seminar was focused on sharing experiences of farmers and industry in promotion of SSI methodologies. Farmers cutting across various climatic zones presented various example of success and lessons learnt in mainstreaming SSI approaches to sugarcane production. Technical session II started Addressing the second session Dr. Biksham said it is important to understand experiences of different regions and in particular farmers who have are actually practicing SSI in order to up-scale it to other regions and to improve SSI further.

Following presentations by made during the technical Session II:

- 1. SSI experiences in UP by Triveni Sugars – Mr. A.K. Tanwar, President, Triveni Sugars, Noida** (Mr. Krishna Kumar Bhagat Project Coordinator, AgSri made this presentation on behalf of Triveni Sugars). The presentation captured various problems faced by the sugar industries and farming community in Uttar Pradesh and how SSI has provided an opportunity to address these issues by providing practical options to the farmers. Some successful cases of the SSI and the constraints faced were also covered in the presentation.
- 2. SSI Plans by Tamilnadu Agriculture University and TN Governemnt - Dr. B J Pandian, TNAU: In his presentations** Dr.Pandian outlined SSI plans of TNAU and TN Govt. with particular reference to research for standardization of SSI technologies, its extension, up scaling of SSI – various measures planned, and policy support by TN Government. He also presented the expected outcome of SSI for farmers, industries as well as Government.
- 3. Promotion of SSI among small growers in Odisha – Mr. Prashant, NIRMAN:** The presentation brought out the history of SSI intervention in Nayagarh, Odisha with small and marginal farmers. The intervention was able to help small farmers increase yields as well as household income. In last three years from 2009 - 11, there is remarkable increase of sugarcane acreage under SSI owing to proactive involvement of farmers and civil society organizations. The presentation as well captured comparative benefits of SSI over the conventional method as perceived by the SSI practicing farmers.
- 4. SSI experiences in Andhra Pradesh – Dr. Padmaja Karanam, AIP-ICRISAT:** The presentation captured SSI experience of WWF-ICRISAT in Medak District of Andhra Pradesh. She covered topics such as variation in yield parameters of SSI and conventional method, and relative differences in per acre income of the farmers, expectations of the farmers from the method, desired interventions for enhancing cane productivity through SSI, opportunities presented by SSI and the way forward.
- 5. SSI experiences of Acharya NG Ranga Agricultural University, Hyderabad by Dr. Vijay Kumar, Asst. Professor:** He presented the results of the research being carried on the SSI technologies in ANGRAU on various parameters such

as physiological and growth factors, leaf area index, yield and quality of crop, intercropping practices and learning derived from these research studies.

6. **GPS Applications by Mr.Raj Samla, CEO Revalsys Technologies:** He basically dealt that how GPS (Global Positioning System) and GIS (Geographical Information System) data could be a very powerful tool for data management and analysis. He presented with the help of a sample that how we can get the all the information about the farmer and cultivated crop with visual in a single click of a mouse. He further added that efforts are on to further develop this technology so that this benefits the decision makers in analysing data and making important inferences from time to time. The technology can help in making important decisions with respect to various aspects of crop cycle. In sugarcane cultivation the tool can be effectively used to measure potential crop output of the large farms.

It was followed by the experience sharing by following farmers:

1. **Mr. Panduranga Reddy, Andhra Pradesh** The presentation captured various problems being faced by the farmers in Zaheerabad area and how collectively by forming a group farmers are able to address these problems. He also shared his experience of starting nursery for sugarcane plants, inputs saving capacity of SSI method and its potential to significantly improve the yield and income of the farmer. He further added that they target every one ha of land to earn at least Rs. 1 Lakh in a planting season.
2. **Mr. Krishna Shinde, Maharashtra-** The presentation captured experience of farmers in water scarce Latur district of Maharashtra. The presentation dwelled on different stages of nursery operations, cane plant body and its physiological characters, various growth phases, and relative advantages of the SSI method based on the experiences of farmers with respect to water, energy and farm inputs. The farmers were able to combine traditional methods of fertilizer application with small amounts of inorganic fertilizers.
3. **Mr. Devadasan and Mr. Baskaran, Tamil Nadu** –The presentations captured how farmers working under institutional framework of SRI farmers association were able to successfully apply its principles to sugarcane cultivation with the support of local government. The progressive farmers from Tamilandu evinced keen interest to promote SSI among all sugarcane growers in the state. Mr. Baskaran, screened a short video of his SSI experience in their region and it was useful not only in generating interest among cane growers but made farmers move from traditional method of using two sett seed planting to bud chip method. The farmers thanked WWF-ICRISAT project team for consistent support and guidance and also



acknowledged the encouragement from various stakeholders such as NGOs and government and are keen to up-scale SSI in the region by supporting other farmers as well.

4. **Mr. Anil Jaidev, Mr. Gopal Singh and Mr. Vijay Singh, Uttar Pradesh** They shared about their encounter with SSI, intercropping practices adopted with the help of this method as it provides for wider and uniform spacing, and the quite encouraging results they have got so far. They also raised queries related to propping and other necessary practices at the field in implementing SSI.
5. **Mr. Shivappa Nirakari, Karnataka** He narrated about his association with Deshpande foundation working on SSI, and the positive results so far he has got with this method in terms of yield, saving of water and inputs.
6. **Mr. Nabha Kishore Das, Odisha** – Coming from a group of small and marginal farmers, Nabha Kishore narrated his experience of having started SSI 3 years back in his small land. His experience has inspired other farmers in the village as they have realised that this method significantly reduces the cost of cultivation and increases the yield.



These farmers shared that how they came to know about SSI, their inhibitions in the beginning, mixed reactions at some places and what they feel about the method at this stage. All of them are influenced with the SSI methodology and are doing their bit to convince other farmers on SSI, simultaneously increasing sugar cultivation under SSI in their respective areas.

After the experience sharing session of the farmers, Dr. Biksham thanked everyone for their valuable contribution to the seminar. He further added that it is an irony that every year billions of rupees are being spent on the agriculture research but unfortunately none of them are based on the problems being actually faced by the farmers in the field. Therefore, it is also necessary that any research is demand driven. According to him, farmers do not make any profit if we include the labour cost and other hidden costs in reality. SSI does not boasts of any miracle but it certainly has the potential to bring them to a better situation.

The day I programmes were concluded with this.

## **DAY II**

On the 2<sup>nd</sup> day of the seminar i.e. 25 August, 2011, the technical session III covered plenary discussion on up-scaling SSI. Parallel Group discussions were organised on the two topics. The seminar participants from Govt., Industry, NGOs, Farmers, Scientists and managers were divided into following groups:

### **Group I**

Topic: Research Issues and Future Action Plan for Research, Chairman: Dr. D. G. Hapase, Ex – director (Vasantdada Sugar Institute) and Dr. B J Pandian, Professor, TNAU, Coimbatore

### **Group II**

Topic: Extension and implementation strategies for reaching more farmers, Chairman: Dr. N Balasundaram, Ex Director, Sugarcane Breeding Institute and Dr. Puthira Pratap, Extension Scientist, SBI.

## **GROUP DISCUSSION - I**

### **Research issues and future action plan for research**

The salient points that were covered in the discussion were:

In SSI methodology, as nursery raising is the most critical aspect, detailed discussions were carried out on:

- Bud chipper- standardisation of blades
- Selection of the bud chips with regard to age and size of the bud chip
- Growing media to be used, ratio for each medium
- Combination of different media
- Size of the trays
- Discussion was carried out on alternatives for trays such as raised beds and related issues



Nursery infrastructure such as shade net, temperature maintenance inside the shade net was discussed. As the temperatures vary in sub-tropical, and tropical regions, the requirements for north India, central, east and south India and how to provide appropriate microclimate for nurseries were also discussed. Time of planting for northern regions in particular and package of practices of nurseries was covered. Incubation time for the cane bud sprouting was also covered.

Other key aspects related to SSI which was discussed during the plenary session included following:

- Field preparation and transplanting related researchable issues such as depth of transplanting
- Minimizing operations and mechanical methods, and options of transplanters
- Optimum plant population and spacing
- Time of planting and soil type
- Tillering and survival aspects
- Suitable varieties for higher number of millable canes and better yields
- Soil's physical and biological management
- Mother shoot cutting - the need and advantages considering some of the farmers experiences.
- Water and fertiliser management especially- micro-irrigation and standardised fertigation schedule for better results
- Crop geometry and wider row spacing with intercropping options
- Pest and disease management especially top shoot borer and early shoot borer, red rot and related issues
- Standardisation of distance for mechanical harvesting
- Cost economics and feasibility for each of the suggested approach was also shared based on the participants' experiences



Some of the industry representatives indicated during the discussion that they would be able to provide the infrastructure on a small farm area and support on the costs to conduct research on some of the discussed topics.

## GROUP DISCUSSION - II

### Extension and implementation strategies for reaching more farmers

In this group the discussion focused on the review of existing extension and implementation strategies in place and their effectiveness in up- scaling SSI. It was realised during the discussion that government's extension service is not very effective and therefore, concerted efforts of various players is required for reaching out to more number of farmers for popularisation of methods such as SSI and SRI. Participants expressed their views and most of them opined that demonstration



of the method at farmers field is the best ever method of extension. When farmers views were invited about whom they consider as the effective extension agents, one of the farmer from UP expressed that local progressive farmers should be promoted as extension agents as they know people, area and the climatic factors.

One of the participants from IFC expressed that it is very important to ensure that any package of practice propagated to the farmer should be in its actual form as there are multiple levels operating in between. This calls for certification for extension agents for quality assurance and to meet the scale of SSI operations. It requires developing market-oriented models for extension services, including capacity building of extension workers both in the public and private sector, as well as farmers. This is a multi-stakeholder process, but the private sector has an increasingly larger role to play. However, some of the participants were not holding similar view, it was also observed by Dr. Balasundaram that mere certification will not ensure this and more importantly, it will not allow farmers to be extension agents. He further added that there are many farmers who may not be certified but they are capable of being very good extension agents.



After due discussion among the participating members following were identified as the extension strategies to reach out to more number of farmers with methods such as SSI and SRI.

- **Training:** Training of farmers through sugar factories, sugarcane farmers group including NGO's, government departments and by experts. The training manual to be given to the participating farmers should be developed in local regional languages besides English.
- **Demonstration:** Farmers Field School (FFS)/Field Demonstrations in leading farmers' fields, KVK's Sugar Mills, research stations, at block level and taluk levels could be quite effective extension strategy to popularise and make people aware of the benefits of the methods such as SSI. In addition, it has to be ensured that these demonstrations are periodically monitored by the experts. Data and findings related to the results of the demonstrations should also be collected, compiled, and published through various electronic and print media means.
- **Farmers exchange visits/Field visits:** Farmers exchange visits or field visits could be organized during different stages of growth of the plant at successful farms and demonstration plots. Field and harvest days to be celebrated and all local farmers should be invited.
- **Networking of farmers club/farmers group:** This will facilitate exchange of information through e-mails, SMS, websites. Agencies like NABARD, AgSri can play an important role in promoting this kind of extension strategies.

- **Training of Farmers:** Progressive farmers, cane development staff of sugar factories, Govt. extension staff/KVK staff and farmers club/group representatives should be trained initially who in turn will train other personnel's for multiplier effect.



## PANEL DISCUSSION: ROLE OF GOVERNMENTS, SUGAR FACTORIES AND OTHER STAKEHOLDERS IN PROMOTING SSI

A panel discussion was held on Role of Governments, Sugar Factories and Other Stakeholders in Promoting SSI. The panelists for the discussion were following:

- Mr. AK Mukhopadhyay, CGM, NRMC, NABARD, Kolkata
- Dr. P. Soman –Vice President, Jain Irrigation Systems Ltd.
- Dr. Rajpal Singh, Sugarcane advisor, IFC, Asia
- Shri Manickam, MD, Shakthi Sugars
- Mr. Pratyush Pandey- Head, Dripteck
- Dr. D. G. Hapase, Ex Director – Vasantdada Sugar Institute, Pune



Dr. Biksham Gujja, facilitating the session requested panelists to express their expectations/interest from the seminar and the proposed discussion.

Following expectations were expressed by the panelists-

- Nonsubsidized irrigation – How to make it possible? (Mr. Pratyush, Dripteck)
- Our role in extension services as a salesmen (Dr. Rajpal Singh, IFC)
- Reasonable sugarcane prices so that it benefits farmers as well as factories (Mr. Manickam, Shakthi Sugars)
- How the production could be increased without increasing the sugarcane area (Dr. Hapase, Scientist)
- Energy security as a lot of energy is consumed for producing Sugarcane (Dr. Soman, Jain Irrigations)

Dr. Biksham explained the goal, overall target, and the issues to be discussed to attain the same.

**Goal:** “To increase the sugarcane production to 500 million tons and improving recovery to 11% by 2025 to meet the national demand for sugar and bio-fuel. This goal can be met by improving the productivity and reducing the input costs and water.”



*During the discussion, it emerged that it is not necessarily reducing the inputs costs and water rather it should be framed at optimizing the inputs costs and water.*

**Targets:** Following were presented for discussion among the panelists and the participants:

- One third of the Sugarcane Cultivation be brought under SSI by end of Plan XII to meet the increasing demand for sugar, fuel and energy needs while reducing the seed cane, water, fertilizer input requirement at least 25% of current level
  - For this every state government (e.g. Tamil Nadu) has to set state targets by consulting the sugar factories.
  - Every sugarcane factory and group may want to have internal targets to contribute to the national Target
  - The required resources- human, financial and institutional may put in place to meet the targets.

**Discussion Points:** Following points were identified for discussion in the panel

- Training, awareness and extension needs- including TOT, extension models, demonstration units, internal capacity within factories, Government extension etc.
- Local groups producing seedlings- Local entrepreneurs, self-help groups etc.
- Efficient water management use technologies ( Drip irrigation, efficient water use)
- Improving the tools, machines and required implements
- Improving the research particularly identification of most suitable varieties which respond to SSI (single seedling, wide spacing)
- Strategy to mobilise resources



## **PROCEEDINGS**

Dr. Biksham explained that it is necessary to have a goal so that we have a national direction. This could be discussed among the panelists and the wider group for any modifications required. Panelist from IFC, Dr. Rajpal Singh observed that there are wide productivity variations in different regions such as tropical and sub-tropical and therefore, SSI plan cannot be the same for entire country rather it should be customised for the different parts of the country. To be more precise, it should be a basket of choices for the farmers wherein he can select what is best for his situation.

Panelist from Jain Irrigation, Dr. Soman observed that our focus should not be on increasing or decreasing the input requirement rather it should focus on optimising the input requirement. Efforts should be more in the states like Uttar Pradesh where water utilisation is high but productivity is less. Dr. Hapase recollecting the experiences of state of Maharashtra mentioned that in his state, government in collaboration with agriculture department prepare plans in consultation with stakeholders and it helps in developing cost effective models as far as possible. Mr. Manickam observed that industry and everyone wants remunerative prices for farmers and factories. He observed that we are not looking at subsidies rather sustainable investments, sustainable production and sustainable productivity.

It was also discussed that there are certain sections which adopt new technologies rapidly where as others are resistive to that. Technology can be propagated through incentives or through population education. However, any technology has to be sustainable in itself which is possible only when it is remunerative for the farmer. Dr. Soman observed that role of sugar industries is very important in educating the farmers for bringing them up for technology adoptions; especially the private sector sugar industries could play a very important role in this.

Another concern raised by the panelist during the discussion was dearth of good agriculture professionals for working as extension agents. It was observed that majority of the agriculture graduates are moving to banks, private companies and other desk jobs in the current scenario. But, interestingly TN Govt, has taken up a pioneer step of establishing one agriculture college in each district which may to some extent address the issue of scarcity of skilled persons in the sector. However, one of the important observations which reflected during the discussion was that the current education system is not preparing the agriculture graduates for village level jobs, working with farmers. Therefore, the focus may be on skills check rather than qualification. Mr. Manickam raised the need for bringing agriculture related education under private sector to meet huge demand of the industry. According to him, organizations such as AgSri and NABARD should come together and join industry in improving human resources in the country. Dr. Hapase remarked that in majority of the current course curriculums, sugarcane details are very limited and any fresh agriculture graduate is not sufficiently equipped to work in the sector. Therefore, it calls for special training of the candidates so that their capacities are built well in advance for the work environment.

Government extension services and its effectiveness were also discussed and it was observed that Government system has so far not proven to be quite effective in reaching out to the farmers. In addition, drip irrigation system and its usability for SSI farmers was discussed. It was concluded that micro irrigation systems such as drip are definitely better and are based on efficient water management technologies but some factors like availability of electricity, water, initial cost and paying capacity of the farmers are to be viewed before recommending drip irrigation system and adding to that it is most important that farmer understands the process and advantage of drip irrigation systems.

The key issues raised during the panel discussion could be summarised as following:

- ToT could be achieved by incentivising or by population education but any technology has to be sustainable in itself for which it has to be remunerative for the farmers.
- Different stakeholders such as Government, sugar industries have to play a vital role in technology promotion.
- Dearth of good agriculture graduates in the sugar sector especially at the entry level as they are moving to banks and private sectors
- Need for special training of agriculture graduates before they enter into work environment as there is limited focus and exposure on sugarcane in the present curriculum
- Need for moving from input oriented agriculture to knowledge oriented agriculture, wherein the focus should be on knowledge transfer
- Irrigation methods, certain drip is a better choice but there are various factors which must be taken into account before recommending drip irrigation to the farmers
- There is no special preference for any particular variety rather the focus should be on the set of agronomic practices required for any variety.

Dr. Biksham thanked all the participants and the panelists for making it to the event and actively participating in the debate to up-scale SSI in the country.

It was followed by the observations of Mr. Vilas Chandran, General Manager, NABARD. He thanked AgSri and SBI, Coimbatore for supporting in organizing the national seminar on SSI. He also thanked all the participating members from Government, Industries, private sector, media, farmers, scientists for their cooperation and participation in the event. He further added that this seminar is the beginning and now NABARD, AgSri, SBI and other stakeholders will again meet in small group to discuss and derive the future strategies and course of action to take this forward. He concluded by saying that our efforts should be towards doing things differently rather than doing different things.

The programme concluded with vote of thanks by Dr. Padmaja on behalf of organizers to all the participating members.

### List of Participants

Sl. No.	Name	Designation	Company / Government / Organization	State / Union Territory
1	Mr. Stephen Arul	Sr.General Manager	Thiru Arooran Sugar Mills Ltd.,	Tamilnadu
2	Mr. Renganathan	Deputy General Manager-Cane	Thiru Arooran Sugar Mills Ltd.	Tamilnadu
3	Mr. Janakiraman	Senior Manager-Cane,	Thiru Arooran Sugar Mills Ltd.	Tamilnadu
4	Mr. Rajagopal	Manager-Cane	Thiru Arooran Sugar Mills Ltd.	Tamilnadu
5	Mr. Anbuselvan	Manager-Cane	Thiru Arooran Sugar Mills Ltd.	Tamilnadu
6	Mr. Venkatesan.	Manager-Cane	Thiru Arooran Sugar Mills Ltd.	Tamilnadu
7	Mr. Sundarraaj	Chief Manager (Cane),	Dharani Sugars	Tamilnadu
8	Mr.N.K.Mahendran	Dy. General Manager, Cane, Unit IV	Bannari Amman Sugar Ltd., Unit-IV	Tamilnadu
9	Mr T Balakrishnan	Sr. Manager	Bannari Amman Sugar Ltd., Unit-IV	Tamilnadu
10	Mr.E.Manivel	Vice President	Bannari Amman Sugar Limited	Tamil Nadu
11	Mr.Kuppusamy	Senior Manager	Bannari Amman Sugar Limited	Tamil Nadu
12	Vijay Sarur	Cane Development Manager	Sri Siddeshwar Sugars	Maharashtra
13	Mr.N.Rajasekaran		Ponni Sugars Ltd	No
14	Mr.Gopinath		Ponni Sugars Ltd	No
15	Pratyush Pande	Country Head	Driptech, inc	Maharashtra
16	Dr.Soman	Sr.Vice President, Chief Agronomist	Jain irrigation:	
17	Dr.Narayana	GM, Cane Development	Jain irrigation:	
18	Mr.Balachandra Babu	MD	Farm Implements India Ltd (FICCI)	Tamilnadu
19	Mr.Raj Samla,	CEO	Revalsys Technologies	AP

20	Mr. Harsh Vivek, ,	Associate Operations Officer	IFC South Asia - Advisory Services (the World Bank Group)	UT
21	Dr. Raj Pal Singh,	IFC Sugarcane Advisor,	IFC South Asia - Advisory Services (the World Bank Group)	UT
22	Dr. M. Manickam	Vice Chairman and Managing Director	Sakthi Sugars	Tamilnadu
23	Mr. Sivasenan	Manager-Cane	Sree Ambika Sugars Ltd	Tamilnadu
24	Mr. Samuel Jay Kumar		Savpnnah Sugar Co Ltd	Africa
25	Mr.R.Velmurgaon		Jain Irrigation Systems Ltd	Tamil Nadu
26	Dr.S.N.Sundarsin	Chief Agronomist	Jain Irrigation Systems Ltd	Tamilnadu
27	Mr.R.Thirunavokkaraju		Media 4 Agri	Tamil Nadu
<b>SCIENTISTS AND AGRICULTURE UNIVERSITIES</b>				
28	Dr. N. Vijayan Nair	Director	Sugarcane Breeding Institute	Tamilnadu
29	Dr. MN.Premachandran	Head, Division of Crop Improvement	Sugarcane Breeding Institute	Tamilnadu
30	Dr. P. Rakkiyappan	Head, Division of Crop Production	Sugarcane Breeding Institute	Tamilnadu
31	Dr. R. Viswanathan	Head, Division of Crop Production	Sugarcane Breeding Institute	Tamilnadu
32	Dr. K. Sivaraman	Principal Scientist (Agronomy)	Sugarcane Breeding Institute	Tamilnadu
33	Dr. N. Rajendra Prasad	Principal Scientist (Seed Technology)	Sugarcane Breeding Institute	Tamilnadu
34	Dr. R. Balakrishnan	Principle Scientist (Head, Statistics, I/C ARIS Cell)	Sugarcane Breeding Institute	Tamilnadu
35	Dr. T. Rajula Shanthy,	Sr.Scientist (Head Extn)	Sugarcane Breeding Institute	Tamilnadu
36	Dr.Puthira Pratap	Scientist, Extn	Sugarcane Breeding Institute	Tamilnadu
37	Ms.Radha Jain	Sr.Scientist (plant physiology and Biochemistry division)	Indian Institute of Sugarcane Research	UP

38	Mr.N.Balasundaram	Retd. Director		NA
39	Mr.P.Murli	Scientist (Agronomy)	Sugarcane Breeding Institute	Tamil Nadu
40	Dr.Vijay Kumar	Assistant Professor	Regional Research Station,	
41	Dr.Paneer Selvam	Professor (Agronomy)	SRS	Tamilnadu
<b>Tamil Nadu Agricultural University (TNAU)</b>				
42	Dr.P.Muthukrishnan	Professor & Head (Agronomy)	TNAU	Tamil Nadu
43	Dr.B.J.Pandian, Ph.D.	Professor & Head (Agronomy), (World Bank) Project Cell,	Water Technology, TNAU	Tamil Nadu
44	Dr.G.Mariyappam, II Phd	Agronomy school	TNAU	Tamil Nadu
45	Dr.S.Ganapathy	Assistant Professor	TNAU	Tamil Nadu
46	Ms.Radhika	JRD		Tamil Nadu
<b>Karnataka</b>				
47	Dr. Loganandhan	Scientist (Ag.Extension),	ICAR, Bellary, CSWCRTI, Research Centre	Karnataka
48	Dr. M.N. Premachandran	Head, Division of Crop Improvement	Sugarcane Breeding Institute	Tamil Nadu
49	Dr. N. Balasundaram,	Retd. Director	Sugarcane Breeding Institute	Tamil Nadu
<b>NGOs</b>				
50	Mr.Prashanth Muniyappa	Program Mnagarer,	Prakruthi	Karnataka
51	Sachin Dingrese,		KVK	Maharashtra
52	Mr.Sachin Kawade		KVK	Maharashtra
53	Mr.Prashanth Mohanty	PM	NIRMAN, N.Vihar, Bhubaneswar	Oddisha
54	Mr.Godfrey Jawahar , Prakasam District, AP	Director	SNIRD	AP
55	Dr.Ramanathan	Head		Maharashtra
56	Basuraj M Badiger	Senior Program Officer	OUTREACH	Karnataka
57	Mr.Sivappa M.N			
58	Er K S Narayanan M Sc (Engg)	Chief Engineer P W D (Retd)		Tamilnadu
59	Mr.Saravana Kumar	SMS (Agronomy)	KVK	Tamilnadu
60	Mr.R.Venugopal		WORDS, NGO	Oddisha

61	Mr.Kedarnath Meher		WORDS, NGO	Oddisha
62	Mr.S.Palanisamy		MO Finissh Agro Divn	Tamilnadu
<b>FARMERS</b>				
<b>Tamil Nadu</b>				
63	S. Devadasan,	Farmer		Tamil Nadu
64	P. Baskaran	President	SRI Farmers Association	Tamil Nadu
65	Mr. K.Bagavathi Babu, MSc Botany	Farmer		Tamil Nadu
66	Mr. Venkatramana	Farmer		Tamil Nadu
67	Mr. Swamy	Farmer		Tamil Nadu
68	Mr. M.Balaji	Farmer		Tamil Nadu
69	Mr.M.Vinoth Kumar	President	SRI Farmers Association	Tamil Nadu
<b>Andhra Pradesh</b>				
70	Pandurangareddy	Farmer		AP
71	Mr.B.AnjiReddy-	Farmer		AP
72	Mr. Alwarswamy	Farmer		AP
<b>Maharashtra</b>				
73	Shri Krishna Shinde	Farmer		Maharashtra
74	Kardad / khandaved	Farmer		Maharashtra
75	Rajkiran Bhimrao Patil	Farmer		Maharashtra
76	Sanjay Jaisingh Rao	Farmer		Maharashtra
77	Pradip Nikam	Representative	NGO	Maharashtra
78	Mr.Santosh	Farmer		
<b>Orissa</b>				
79	Nabha Kishore Das	Farmer	ARS	Odisha
<b>Uttar Pradesh</b>				
80	Mr. Gopal Singh	Farmer	Triveni Sugars	UP
81	Anil Kumar	Farmer	Triveni Sugars	UP
82	Vijay Singh	Farmer	Triveni Sugars	UP
<b>Karnataka</b>				
83	Mr. Shivappa Nirakari		Outreach	Karnataka
<b>NABARD</b>				
84	Mr. S. K. Mitra	Executive Director	NABARD	Maharashtra
85	Mr.Vilas Chandran	General Manager	NABARD	Maharashtra
86	Sri A K Mukhopadhyay, CGM	Chief General Manager	NRMC, NABARD	WB



87	Smt T S Raji Gain	General Manager	NRMC, NABARD	WB
88	Sri M K De	AGM	NRMC, NABARD	WB
89	Sri Rajesh Meena	Assistant Manager	NABARD	
90	Sri P M Relkar, DGM	Assistant Manager	TSD, NABARD HO	
91	Dr.Satya Sai	Assistant Manager	NABARD	Maharashtra
92	Mr.Pratap		NABARD	
93	Mr.Ashok Jadav	Pune	NABARD	Maharashtra
94	Mr.Srinivasulu	RO	NABARD	Karnataka
95	Shri.S.S.Vaseeharan, Manager	Manager	NABARD, Regional Office	Tamilnadu
96	Mrs Praveena Nandanwar, Manager	Manager	NABARD, Regional Office	UP
97	Sri B K Nayak, Manager	Manager	NABARD Regional Office	Odisha
98	Sri R I A Selvan, AGM	DDM, Coimbatore	NABARD Regional Office	Tamilnadu
99	Mrs.CPR.Priyadharshini	Assistant Manager	NABARD Regional Office	AP
<b>GOVERNMENT OF TAMIL NADU</b>				
100	Mr.Gnanaoli	Dy.Director	Sugarcane & Cotton	Tamilnadu
<b>AgSri Consultants</b>				
101	Dr.D.G.Hapase	Consultant		Maharashtra
102	Dr.Padmaja Karanam	Consultant	ICRISAT	AP
103	Dr.Vinod Goud	Consultant	AgSri	AP
104	Dr.U.S.Natarajan	Consultant	AgSri	Tamilnadu
<b>AgSri Participants</b>				
105	Dr.Biksham Gujja	Chairman	AgSri	AP
106	Mr.TVV Rao	BD & SM	AgSri	AP
107	Suhasini	Manager, HR&A	AgSri	AP
108	Sraban K.Dalai	Manager, IT& GIS	AgSri	AP
109	Surender Goud	FC	AgSri	AP
110	Krishna K.Bhagat	PC	AgSri	UP
<b>MEDIA</b>				
111	Mr. S. Mannan	News reporter	Indian Express	Tamil Nadu
112	Mr. Shakti	News reporter	Dinamani	Tamil Nadu
113	Mr. Rajesh	News reporter	Daily Thatkal	
114	Mr. Raghupati	News reporter	Dinakam	
115	Ms.LN.Revathy	Spl. Correspondent	Businessline	