



# IAPSIT NEWSLETTER



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*Serving the World of Sugar*

## IAPSIT – Celebrating 10 Years of Excellence



**Yang-Rui Li**  
President, IAPSIT

Over the past five decades, the world has plunged into a pattern of unsustainable economic growth. Accelerated consumption of fossil fuels and deforestation are only the most visible examples of how, in the effort to support our lifestyles, we are exhausting the planet's natural resources and accelerating climate change, which in turn threatens life-sustaining ecosystems, agricultural production and the economy. The current situation therefore demands a transition to a *Green Economy* that does not worsen climate change or destroy the planet in order to profit. Development of renewable energy and clean technology sectors must be accelerated to restore the eco-environmental balance. A

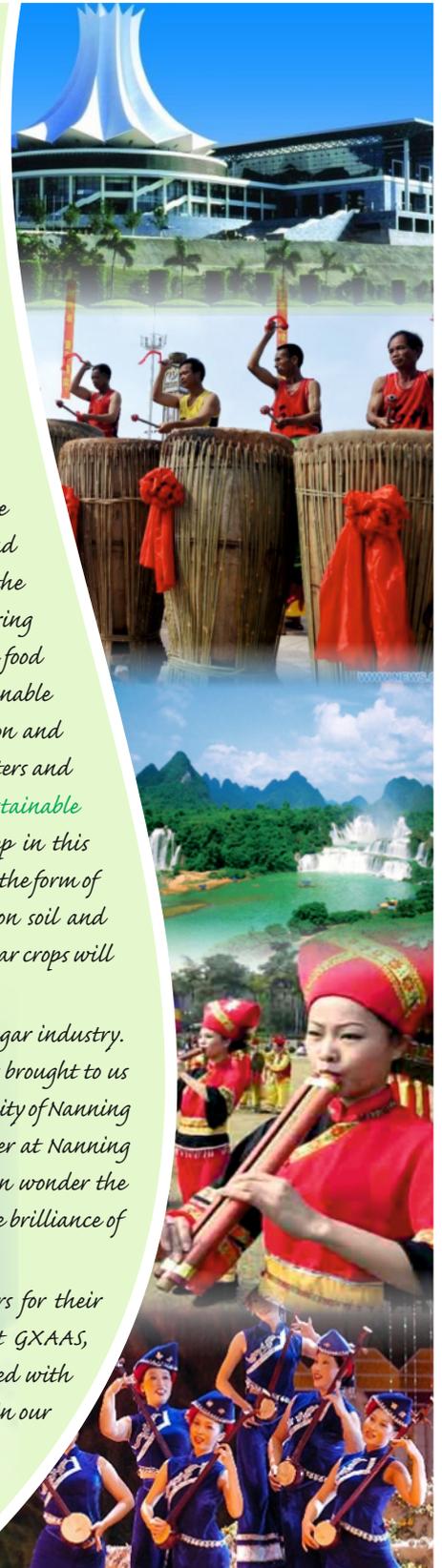
*Green Economy* not only protects ourselves and our planet, but can provide millions of jobs as we develop and install new technologies, rebuild and retrofit buildings, and devise new processes and modes of production. International initiatives exploring the implications of Green Growth at the sectoral level include the FAO's project on Greening the Economy with Agriculture, covering sustainable development, food security and poverty alleviation through the mobilisation of the food and agriculture sector. Ever since its inception in 2004, IAPSIT is committed to sustainable development of sugar and integrated industries in developing countries through introduction and dissemination of *Green Technologies* with the help of conferences, meetings, workshops, newsletters and exchange of professionals. The organization of IS-2014 conference on *Green technologies for sustainable growth of sugar and integrated industries in developing countries* is one such positive step in this direction. Sugarcane is endowed with Green Energy which is made available to common man in the form of bio-fuels, bio-electricity, bio-plastics, bio-compost, sugars as well as its invigorating impact on soil and climate. In IS-2014 conference, new and emerging technologies to harness the green power of sugar crops will be our main focus.

The IS-2014 in Nanning marks the completion of a decade of IAPSIT in its service to global sugar industry. Looking back, I am amazed by the unexpected blessings and opportunities this association has brought to us through meetings, mentoring and sharing. Our journey of excellence started from this beautiful city of Nanning in 2004, we travelled to Guilin in 2006, Egypt in 2008, India in 2011 and now gather together at Nanning again for thanksgiving. In these ten years, IAPSIT has become a global association and I often wonder the truthfulness of scripture verse saying that "Thine honour shall rise up like the Morning Star, the brilliance of thy glory shall be before all the nations of the earth."

At this historical juncture, I would like to congratulate our past and present EC members for their inspiration and vision. The constant support received from our friends, supporters, staff at GXAAS, Secretarial staff and global fraternity during the past ten years was overwhelming. We started with nothing and then reached to such a great height in 10 years. Aiming for 'Excellence' will remain our strategy in times to come. Congratulations!

Welcome to the Green City-Nanning.

*Yang-Rui Li*



*Towards a Sweeter and Prosperous Tomorrow*

## FOCUS

### Green Growth Initiatives in Developing Countries

Green growth is primarily about sustainable and equitable development. The concept of green growth has its origins in the Asia and Pacific Region. At the Fifth Ministerial Conference on Environment and Development (MCED) held in March 2005 in Seoul, 52 Governments and other stakeholders from Asia and the Pacific agreed to move beyond the sustainable development rhetoric and pursue a path of "green growth". To do so, they adopted a Ministerial declaration (the Seoul Initiative Network on Green Growth) and a regional implementation plan for sustainable development. This commenced a broader vision of green growth as a regional initiative of UNESCAP, where it is viewed as a key strategy for achieving sustainable development as well as the Millennium Development Goals (in particular 2 and 7 relating to poverty reduction and environmental sustainability).

The green growth approach adopted by the MCED sought to harmonize economic growth with environmental sustainability, while improving the eco-efficiency of economic growth and enhancing the synergies between environment and economy. In 2008, the Republic of Korea (RoK) adopted 'low carbon green growth' as the country's new development vision, which was followed shortly after by the release in 2009 of their National Strategy for Green Growth and Five-Year Plan for Green Growth. The RoK has been instrumental in promoting the concept more broadly, including through the OECD. At the OECD Ministerial Council Meeting in 2009, 30 members and five prospective members (comprising approximately 80% of the global economy) approved a declaration acknowledging that green and growth can go hand-in-hand, and asked the OECD to develop a green growth strategy bringing together economic, environmental, technological, financial and development aspects into a comprehensive framework. Since then, the OECD has become a major proponent of green growth and supports efforts of countries to implement green growth.

In its sixty-sixth session, UNESCAP countries adopted the Incheon Declaration on Green Growth, in which members expressed their intent to "strengthen efforts to pursue green growth as part of their development agenda. The main focus of green growth in this context was for developing countries in Asia and the Pacific region to harmonise economic growth with environmental sustainability, while improving the eco-efficiency of economic growth and enhancing the synergy between environment and economy.

In 2010, the RoK established the Global Green Growth Institute (GGGI) as a non-profit foundation. The GGGI is dedicated to diffusing green growth as a new model of economic growth, targeting poverty reduction, job creation, social inclusion, and environmental sustainability, climate change mitigation, biodiversity loss, and security of access to clean energy and water. In 2010, at the G20 Seoul Summit, leaders also recognized green growth as an inherent part of sustainable development which could enable countries to leapfrog old technologies in many sectors. They agreed to take steps to create enabling environments for the

development of energy efficiency and clean energy technologies. In fact, almost the entire global green stimulus was made by G20 countries, with measures including support for: renewable energy; carbon capture and sequestration; energy efficiency; public transport and rail; improving electrical grid transmission; as well as other public investments and incentives aimed at environmental protection. In 2012, the Mexican Presidency of the G20 introduced "inclusive green growth" as a cross-cutting priority on the G20 development agenda.

Green Growth also depends on investments in the agricultural sector and the viability of farms in developing countries to ensure future food production. Advances in agricultural technology should yield productivity increases in most countries, but new technologies must be affordable, adaptable to alternative farming systems and geared to environmental protection. Agriculture provides a range of environmental and ecosystem services which are essential to Green Growth, including mitigation of greenhouse gases through carbon sequestration. Although direct

greenhouse gas emissions from agriculture account for about 10-12% of the total, the agricultural sector has the potential to offset emissions from other sectors. It is estimated that increasing the removal of atmospheric CO<sub>2</sub> through carbon sequestration in soil and vegetation sinks in agriculture has the potential to offset up to 20% of global fossil fuel emissions. However, this depends on enhanced soil management and cultivation as carbon sequestered in soils can be released back to the atmosphere through inappropriate farming practices. Because agriculture accounts for approximately 37% of total land use, the sector plays a key role in the preservation of ecosystems which provide the basis for Green Growth. Agriculture affects the natural environment in providing for management of land and water resources, habitat protection, flood control, biodiversity maintenance, and shaping and protecting landscapes. Agricultural land management has been a positive force for the development of plant varieties, animal habitats, woodlands and wetlands. Attempts to place a monetary value on the environmental services provided by agriculture underline its rising importance in ecological and economic terms. Sugarcane cultivation spread in over 26 Mha, mostly in developing countries, therefore, has tremendous potential to contribute in green growth owing to its high biomass production, green fuel, and carbon sequestration ability.

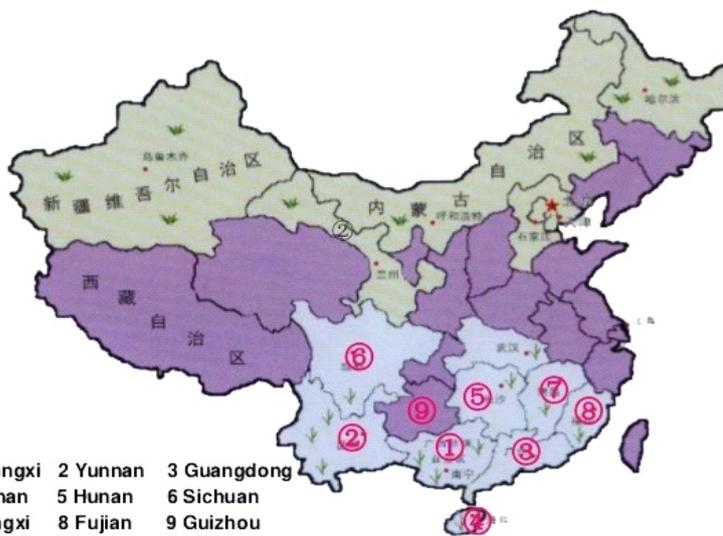
Agriculture also provides the basis for the well-being of rural populations in OECD countries and poverty reduction in developing countries. About 75% of the world's poor live in rural areas and are dependent on the agricultural sector for their livelihoods. Agricultural growth, through its leverage effects on the rest of the economy, can enable poor countries, poor regions and poor households to raise employment and incomes. In narrowing the rural-urban income gap and reducing rural poverty, agriculture can connect rural populations to broader economic development by providing a key link to Green Growth.



### Sugar Industry in China: an overview

China is the world's third largest sugar producing country after Brazil and India. The annual production of white sugar in China during recent years ranged from 11-13 MT. Besides a large quantity of pulp, paper, alcohol, yeast, xylitol, chemicals, bio-manure, animal feed, bio-electricity are also produced by the sugar mills. Production of drinking sugarcane juice is also a small scale industry in China. During the past decade, more than 90 % of the sugar production was contributed by sugarcane. Sugarcane is a major crop in southern China, especially in Guangxi, Yunnan and western Guangdong. Guangxi is the dominant sugarcane and sugar producer region in China. It is the contribution of Guangxi which makes China the third biggest sugar producer in the world. In 2013-14 milling season, the total sugar production in China was 13.32 million tons of sugar, out of which 12.57 million tons was produced from sugarcane.

- 1 Guangxi 2 Yunnan 3 Guangdong
- 4 Hainan 5 Hunan 6 Sichuan
- 7 Jiangxi 8 Fujian 9 Guizhou



#### Sugar production

Chinese sugar industry encompasses 270 operating sugar mills, 233 are exclusively sugarcane processing and 37 process sugar beet, and they belong to 48 sugar groups. Besides, there are 11 sugar refineries. Many products, such as pulp, paper, alcohol, yeast, rum, xylitol, chemicals, cane juice, bio-manure, feed, and electricity are also produced from sugarcane and sugar beet. The Chinese sugar industry is about 6-8 billion RMB Yuan industry (1 USD=6.15 RMB Yuan approx.), contributing approximately 0.1 % of the total GDP in China, but it is important for ensuring the basic sugar supply in China because the sugar consumption has been increasing very fast in recent years, and it is necessary to ensure at least 70 % of sugar consumption is met by domestic production. Based on the statistical information, the sugar consumption in the country was 13.50 MT in 2011-12 and 13.90 MT in 2012-13. The current sugar production could not meet the demand of domestic market. In fact, sugar import has increased in recent past, which was 2.92 MT in 2011, 3.75 MT in 2012, and 4.45 MT in 2013. In fact, the sugar import is stimulated by the big difference of sugar price between domestic and international markets although it is too much for the domestic market in the recent two years. For example, the average sugar price was 5653 RMB Yuan per ton in China, while the

international sugar price dropped down from US 22 to 16 cents per pound (2983 to 2169 RMB Yuan per ton) in 2012-13; and the average sugar price was 4550 to 4600 RMB Yuan per ton in China while the international sugar price dropped down to 15 cents per pound (2034 RMB Yuan per ton) in 2013-14. Besides, China produced 9.5 MT starch sugar and 3000 tons of saccharin in 2013. These trends in the international market

have cracked a very difficult time for Chinese sugar industry.

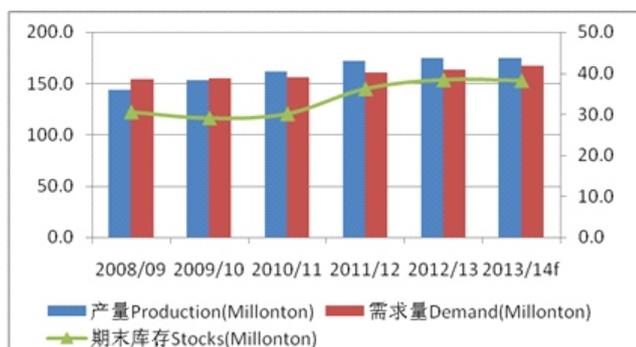
The major cane sugar producing provinces in China are Guangxi, Yunnan, Guangdong and Hainan, and the major beet sugar producing provinces are Xinjiang, Heilongjiang and Inner Mongolia, other sugar producers contributed very little. The dramatic expansion of sugarcane area in China in recent years is mostly due to better sugar price in both international and domestic markets. But at present, both sugar factories and farmers are facing a difficult time as sugar and sugarcane

prices have dropped down to a low level. In the largest sugarcane and sugar producing area of Guangxi province there are 104 sugar mills which belonged to 30 sugar groups or companies Ltd. with average daily milling capacity of 6652 tons of millable cane. Among 104 mills, 20 belong to 5 state owned or state-controlled enterprises.

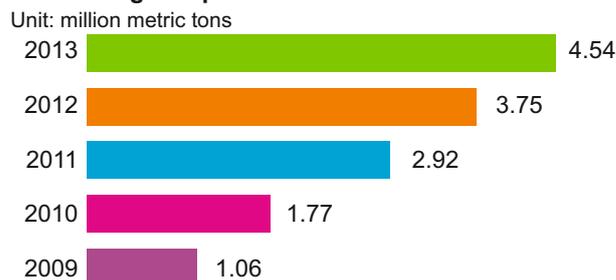
The average cane productivity in Guangxi has reached 83.58 t/ha in the year 2007-08, but kept decreasing in the later years due to many abiotic stresses. The current sugarcane productivity hovers around 65 tons/ha, consistent efforts are being made to develop locally adapted Green Technologies to minimize the adverse impact of biotic and abiotic stresses.

#### Sugar Consumption

While sugar is the major sweetener used in China, saccharin also plays an important role. China's sugar consumption is normally about 7.0 million tonnes, and over the last decade has grown at an average annual rates close to 2.0 percent. HFCS and glucose are also produced in China, but do not play a major role. According to USDA report, in 2012-13, China consumed 15.1 million tons of sugar, compared to the 10.42 million consumed by the US, and China had reserves of 6.79



#### Annual Sugar Imports



Source: National Bureau of Statistics

LI YI / CHINA DAILY

million tons. China, the second-largest sugar consuming country after India, imported 709,873 metric tons in October, compared to 591,855 metric tons in September. Domestic sugar prices in China have been high, with the government purchasing the sweetener to support the country's 40 million sugar farmers. But high prices at home encourage buyers to import from the global market, where sugar is trading at a three-year low, almost a 109 percent increase over the same period last year.

Per capita sugar consumption is around 10.0 kg. This level is significantly below the world average of around 24 kg. It is also much lower than the consumption in neighbouring Asian countries (51 kg in Malaysia, 24 in India, 20 kg in Republic of Korea, 26 kg in Thailand, 13 kg in Indonesia). The low per capita consumption can be attributed to traditional eating habits, relatively low per capita GDP and the use of substitutes. Traditionally, the Chinese diet utilizes less sugar in meal preparations. Direct sugar consumption by households accounts for about 50 percent of the total consumption, with the remainder being used industrially for manufactured foods.

#### Emerging challenges for Chinese Sugar Industry

Drought and frequent natural calamities are the most important constraints for sugarcane and sugar productivity in China because more than 80 % of sugarcane is grown in the upland areas where adequate irrigation is not available. Beside, diseases and insect-pest, poor ratoon productivity and over fertilization of cane fields are major problems in Guangxi area.

Furthermore, the cost of sugarcane production in the country has increased substantially in the last few years due to increased cost of input and non-availability of farm labourers.

At present, mechanization is accounting for about 40 to 50 %

field operations in sugarcane production but almost 100% cane is manually harvested which cost 140-150 Yuan (22.8-24.4 USD) per ton millable cane.

#### Future prospects of Chinese Sugar Industry

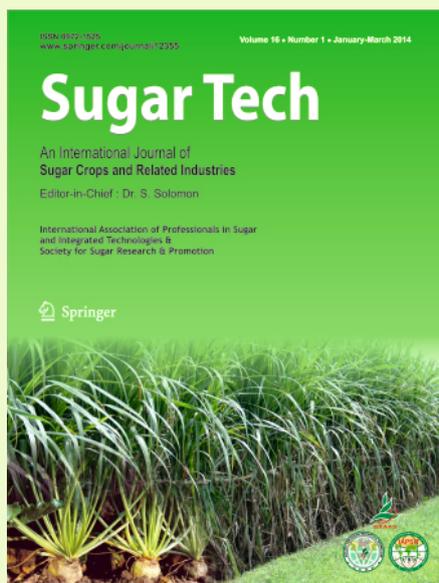
The goal of China's sugar policy is self-sufficiency, but this is becoming ever more difficult to achieve as returns from sugar are often lower than the returns from competing crops, and comparative advantage incentives are increasingly influencing planting decision. The domestically produced sugar supplies are not expected to keep pace with the growth in domestic consumption. The population expansion rate has averaged 1.4 percent over the last decade, and this is likely to continue. There has also been significant income growth during the last two decades, which is expected to accelerate in the future. The ongoing growth will most likely increase consumer demand for sugar-based processed foods, beverages, snacks, and desserts, it may push the growth rate of sugar consumption which could be as high as 8 percent annually over the next few years. With increasingly focused government efforts to enhance productivity and improve returns from domestic production, the growth rate of imports may be slowed. Based on the reality of high production cost and great pressure of international, sugar industry in China has a massive restructuring plan to boost its productivity, through improved sugarcane varieties, bio-intensive sugarcane agriculture, mechanization, recycling of organic residues, healthy seed-cane program and enhancing the ratoon yields. It is visualized that by the year 2030 sugarcane productivity in china will touch the magic figure of 100 tons/ha.

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# Sugar Tech

An International Journal of sugar Crops and Related Industries

Sugar Tech is the official journal of Society for Sugar Research and Promotion and IAPSIT. Sixty three issues in 16 volumes have already been published in last 16 years. Research articles are received from all over the world. Concerned libraries from all over the world have been subscribing Sugar Tech. Sugar Tech has come to be a leading international journal with its unique quality and standard. It covers current references on sugarcane, sugarbeet, industry and technology along with addresses of corresponding authors, so that interested



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person could contact them as per their own interest. Sugar Tech is being indexed in SCI, CAB International, Chemical Abstracts, Google, INSDOC, SCOPUS, Sugar Industry Abstracts, etc. The society requests all the scientists/ industrialists/ technologists engaged in sugarcane, sugarbeet and related industries to contribute their research findings to Sugar Tech and also to become members of the society with their active participation so that the aims and objectives of the Society could be fulfilled in their true perspectives.

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## HIGHLIGHTS

## IAPSIT: A Journey of excellence 2004-2014

The IAPSIT came into existence in November 2004, in Nanning at the time of the International Symposium on **Sustainable Sugarcane and Sugar Production Technology**. The International Advisory Board of IS-2004 decided to form a forum for the comprehensive improvement of sugar industry of the developing countries. In its ten years of journey, IAPSIT has organized five International Conferences, many workshops, specialized meetings, and its members represented in many national and international events. IAPSIT was established to play a catalytic role in providing technological support to sugar industry of developing countries through mutual exchange of scientific knowledge and training. During last 10 years, it has been successful in bringing together hundred of professionals and organizations working on sugar crops and integrated industries.

Our journey of excellence started in 2004 with the International Symposium on *Sustainable Sugarcane and Sugar Production Technology* held at Nanning from 29<sup>th</sup> November to 2<sup>nd</sup> December, 2004. This was a memorable event in the history of Chinese sugar industry, in which 270 delegates from 20 countries participated. The symposium was inaugurated by Vice-Governor of Guangxi Province. A special session on "Sugar Industry across the Globe" was major attraction. In IS-2004, 148 papers were presented in 11 technical sessions. The participants were taken to the experimental sites of Guangxi Sugarcane Research Institute, Tropical Sugarbeet Demonstration Centre of Syngenta and Nanning Sugar factory.

In 2006, IAPSIT organized the International Symposium on *Technologies to Improve Sugar Productivity in Developing Countries* from 5 to 8 December, 2006 in Guilin in Guangxi province, P.R.China. Nearly 243 representatives who made scientific contributions in IS-2006 came from 23 different countries including China, India, Egypt, Thailand, Philippines, Myanmar, Cuba, South Africa, Fiji, Indonesia, Kenya, Nigeria, USA, Australia, Argentina, Israel, Brazil, Japan, Bangladesh, Colombia, Mauritius, Papua New Guinea and Sri Lanka attended the conference. 184 papers were received for IS-2006 (111 of them were from abroad). In addition, 87 posters were received from various authors and they were displayed in the Poster Session. The scientific presentations in the symposium were organized in nine technical sessions and many famous scholars, sugarcane, sugar and industry experts presented their papers/ views related to various

problems and issues concerning sugar industry of developing countries.

A visit to Liuzhou Sugar Industry Co. Ltd in Liuzhou 160 km south of Guilin was also organized on the 7<sup>th</sup> December to acquaint the participants with the cane harvesting machinery and latest milling techniques being followed in China. A sugarcane harvesting machine designed and manufactured in China was also shown to the participants.

Many new ideas and technologies, relevant to the need of developing countries were discussed and certain collaborative exchange programs were finalized. The major areas where participants showed their interest in exchanging knowledge and technologies with each others were sugarcane germplasm, cane harvester, bio-fuels, minimization of sugar losses, use of chemicals in improving cane productivity, bio-fertilizers, bio-utilization of sugar industry residues, improved processing technologies, etc. The conference was appreciated by all the participants, especially the leading role being played by IAPSIT in reshaping the sugar industry of the developing nations. It was envisioned that IAPSIT organized international conference and satellite workshops/ seminars will help improving the socio-economic and technological status of sugar industry of developing countries. The pragmatic efforts of Chinese Government by establishing a permanent Secretariat of IAPSIT at GXAAAS, Nanning was highly appreciated by everybody.

In 2007, an *International Workshop on Drip Irrigation Applied in Sugarcane* was held (May 24 to 26, 2007) with 128 participants from Guangxi, Guangdong and Fujian provinces of China. The trainees attended a three-day training course including lectures given by experts from Israeli and local companies, field trip and discussions. This training course was sponsored by IAPSIT, and organized by Guangxi Academy of Agricultural Sciences (GXAAS), Sugarcane Research Center, Chinese Academy of Agricultural Sciences, Guangxi Sugarcane Research Institute, Guangxi Society of Sugarcane Technologists and Guangxi Millable Cane Association. It was financially supported by PLASTRO Irrigation System Ltd., Guangxi Sugarcane Research Institute and Guangxi Ruijian Quansheng Agricultural Water-Saving Irrigation Technology Co. Ltd.

Dr. Nir Aloni, Principal Agronomist of PLASTRO Irrigation System Ltd., Israel was the major foreign resource person and Mr. Jing-Jian Huang, General Manager of Guangxi Ruijian Quansheng Agricultural Water-Saving Irrigation Technology Co. Ltd, as local expert to give lectures. Dr. N. Aloni expressed the principles, construction, installation, operation, management, maintenance, agronomic adoption and modification of drip irrigation system in sugarcane based on his global experiences.

The International Workshop on *Technologies for Sugar Crops Improvement and Special*



Meeting of IAPSIT for the International Conference IS-2008 (Egypt) was organized at Beihai, P.R. China on 7-8 Dec, 2007. It was attended by 15 participants from China, USA, Egypt, India and Bangladesh. The meeting started with a welcome speech by Dr. S. Solomon, Secretary-IAPSIT. Dr. Prof Yang-Rui Li, President of IAPSIT addressed the gathering emphasizing the need for active participation of each members of IAPSIT to achieve its goals in making cane growers and sugar industry of developing countries moving towards self-reliance with better and improved technologies. He stressed on organizing more workshops, and meetings through IAPSIT in developing countries on different aspects of sugar crops agriculture, processing and diversification. Prof. Li also discussed current scenario of global sugar production and apprised the audience about sugar production in China and futuristic need of sugar industry.

A seminar on Technologies Innovation for Cane Sugar Industry and Trade Fair for Sugar Industry was held in Chongzuo City, Guangxi, China on February 18, 2009. The meeting was co-sponsored by Guangxi Department of Sciences and Technology and Chongzuo Municipal People's Government. Prof. Yang-Rui Li, President of IAPSIT and President of Guangxi Academy of Agricultural Sciences (GXAAS), Zhi-Ren Jia, President of China Sugar Association, Da-Ke Chen, Director of Guangxi Department of Science and Technology, and the experts from sugar research institutions, universities and sugar industry entrepreneurs attended the seminar and fair. Prof. Yang-Rui Li gave a speech on introduction of new sugarcane varieties bred by GXAAS and new technologies for applying vinasse from sugar mill based on rational quantity in sugarcane fields

The 3<sup>rd</sup> International Conference IS-2008 was organized at Sinai University, Al Arish (Egypt) from 11-14<sup>th</sup> September, 2008. The conference was jointly organized by International Association of Professionals in Sugar and Integrated Technologies (IAPSIT) and Sinai University. The IS-2008 conference was well attended and represented by over 300 delegates came from 23 developed and developing countries.

The theme of the IS-2008 conference was 'Meeting the Challenges of Sugar Crops and Integrated Industries in Developing Countries'. The conference was inaugurated by H.E. Amin Abaza, Minister of Agriculture and Land Reclamation, Egypt. The inaugural ceremony of IS-2008 was graced by Mr. Abdel Fadil, Governor of North Sinai, Dr. Peter Baron, Executive Director, International Sugar Organization, Mr. S.L. Jain, Director General, Indian Sugar Mills Association (ISMA), Mr. Zhao Zhang, China Ministry of Agriculture, Dr. Hassan



Rateb, President Board of Trustees Sinai University, Dr. Yang-Rui Li, President of IAPSIT, Dr. S. Solomon, Secretary IAPSIT & IS-2008, Prof. M.I. Nasr, Coordinator IS-2008 and members of Executive Committee of IAPSIT.

Dr Peter Baron, Executive Director of International Sugar Organization **presented a paper on 'Socio-economic perspective of the sugar-ethanol business in developing countries'** said "that sugar will remain, a highly political commodity, characterized by political interventions for better or worse, depending on where you stand. For us in the ISO the socio-economic role of sugar and ethanol in development is very high on our political agenda because the lion's share of our members is developing and least developed countries." In many cases, sugar and nowadays, ethanol, plays a tremendous role to give the rural population a reliable and sustainable income and work. He emphasized that there are many policy and economy related drivers shaping the socio-economic perspectives in developing countries and the most pertinent ones are consumption potential, diversification (ethanol, electricity cogeneration), sugar crops as feeds-tocks for ethanol, prices (international and domestic), self-sufficiency as a policy objective, trade patterns, trade flows and destination refining, sustainable production – an indispensable objective. Dr. Baron reiterated that technological and scientific advances and innovations have to be embraced to the fullest extent possible. There are still a lot of productivity and efficiency reserves which will be tapped over the coming years in field and factory. They will make sugar crops even more competitive as a food and energy supplier. He cited a few examples, viz., genetically modified, high yielding, more disease resistant beet and cane varieties. Tropical beets and winter beets, better transport infrastructure, more sophisticated logistics and last but not least state of the art technology in processing to reduce post harvest losses, to augment extraction rates and to develop alternative and complimentary uses like bio-degradable plastics.

Dr. S.L. Jain, of ISMA apprised the elite gathering about the *Economic Importance of Sugar and Integrated Industry in Developing Countries*. He pointed out that "sugar is one of the major agricultural commodities just after cereals and oils, which accounts for 10% of dietary calories worldwide. About 76% of sugar in the world is produced from the sugarcane while 24% sugar is produced from sugar beet and over 75% of cane sugar is produced in ten developing countries. Sugarcane is a major source of income to millions of farmers in the developing countries and therefore, the sugar industry plays an extremely important role in the economies of respective countries.

Prof. Mahmoud I. Nasr, appreciated the efforts of IAPSIT Executive Committee and the management of Sinai University in holding IS-2008. The IS-2008 conference was arranged in six technical sessions and a special session on *Premier Sugar Crops Research Institutes and Associations of*

the world was organized on 11<sup>th</sup> September, 2009.

The organizing committee of IS 2008 invited all delegates to a gala dinner on a cruise boat "Paharoah" on the Nile with belly dancer, folklore show and western music. The exquisite Egyptian cuisine made it a memorable dining experience for everybody. All participants enjoyed a magnificent view of Cairo city. During the cruise, following dinner, participants enjoyed a folklore show and belly dancing to the tune of Egyptian-Western music. The IS-2008 delegates were also taken to Hawamdia Sugar Unit, about 30 kilometers from Cairo

Dr. Hassan Rateb, Chairman Board of Trustees, Sinai University presented "**Sinai University Peace Award**" to Prof. Yang-Rui Li, Dr. S. Solomon and Prof. M.I. Nasr for their outstanding contribution in promoting peace, goodwill and mutual understanding among the people of developing countries. Dr. Yang-Rui Li, President of IAPSIT presented "**Global Award for Excellence-2008**" to Dr. S. Solomon, Dr. G.P. Rao and Dr. Q.Z. Tang for their great contribution in promotion of science & technology among developing countries.

The 4<sup>th</sup> IAPSIT international sugar conference and expo on "*Balancing Sugar and Energy Production in Developing Countries: Sustainable Technologies and Marketing Strategies*" was held at hotel Parkland Exotica, New Delhi, India from 21-25 November, 2011. The conference was jointly organized by IAPSIT, The Sugar Technologists Association of India (STAI) and Society for Sugar Research & Promotion (SSRP). Over 600 researchers, technologists, managers, manufacturers, suppliers and policy makers from 32 sugar producing countries participated to share their views and experiences for profitable and sustainable growth of the sugar and its integrated industry in the developing countries. The IS-2011 Conference was a major event for all the professionals involved in the sugar, ethanol, energy & integrated industries and provided an unrivalled overview of all new happenings in the sugar and energy sectors.

The conference was inaugurated by honorable Shri Sharad Pawar, Minister of Agriculture and Food Processing, Government of India and Shri Farooque Abdullah, Minister of New and Renewable Energy Sources, (MNRES) Government of India on 21<sup>st</sup> November, 2011. Dr. S. Solomon, President & Co-ordinator of IS-2011, Prof Yang-Rui Li, President IAPSIT and Dr G.S.C. Rao, President STAI joined hands in lighting the lamps for official beginning of IS-2011. Over 220 overseas delegates from China, Iran, Australia, Brazil, Dubai, Egypt, Fiji, France, Indonesia, Iraq, Mauritius, Myanmar, Nigeria, Pakistan, Reunion Island, Saudi Arabia, South Africa, Sri Lanka, Thailand, United Kingdom, USA, Vietnam, Kenya, Japan, Zimbabwe, Bangladesh participated in the conference. The president of IAPSIT Prof. Yang-Rui Li welcomed chief guests and all international and national delegates. In his inaugural address, he appreciated the efforts and support received from the Sugar Technologists Association of India, Indian Sugar Mills Association (ISMA)

and especially Government of India. Dr. Li said that India is also known as the 'Original Home of Sugar and Sugarcane' and is world 2<sup>nd</sup> largest producer and highest consumer of sugar. The Indian Sugar Industry is famous for its great potential, being capable of providing enough sweeteners to over 1.30 billion people. In addition it has developed and mastered the technologies to produce bio-electricity, bio-ethanol, bio-manure and many co-products without any adverse impact on environment. As a matter of fact, Indian sugar industry is highly eco-friendly and developing countries are looking at India for such a perfect model. It is important to note that nearly 7.5 % rural Indian population depends upon sugarcane for their livelihood and therefore its significance in socio-economic life of masses can not be ignored. Today we have gathered here to discuss about this Crop, which is grown in over 100 countries in approximately 24 Million hectare land. This crop provides us food, feed, fuel, shelter, paper, boards, medicines and if I don't exaggerate, probably in next 10 to 15 years all our vehicles will run on ethanol produced from sugarcane. This is indeed one of the most "useful plant on the planet Earth" and new researchers have shown that cultivation of sugarcane has a cooling or air conditioning effect on the climate. With so many economic and social bounties this crop is facing enormous threats from biotic and abiotic stress, natural calamities, declining productivity and many others. The cost of cultivation has seen a meteoric rise in last 10 years. In this context, the yield and sugar recovery are static since last 10-15 years. However, the plant per se has enormous potential which is still untapped, be its productivity, energy or by-products. If this remain stagnant for next few years all our future planning of modernization, expansion of sugar industry, bioethanol blending program will go haywire if sugarcane productivity & production in developing countries are not improved substantially. I am of the opinion that average world sugarcane productivity should be around 100 ton/ha from its present level of 70 tons/ha to able to sustain our sugar and energy industry without any further escalation in its cost of cultivation. This is possible only through progressive introduction of scientific cultivation of sugarcane crop. As You know that sugarcane cultivation is facing many old and emerging challenges which are a hindrance in improving sugarcane productivity in developing countries, it is imperative that new and innovative methods should be tried in its production, protection and processing. The IAPSIT took up this responsibility to organize scientific & technical meetings and conferences of world renowned experts to



discuss the problems and suggest viable solutions which are impeding sugarcane production and productivity". Dr. G.S.C.Rao, President STAI lauded the efforts of STAI and achievements of Indian sugar industry in recent past which has emerged as global leader in sugar and energy production from sugarcane.

The inaugural ceremony was followed by the plenary lectures from Dr Peter Baron, President, International Sugar Organization, USA, Mr. Abinash Verma, Director General, Indian Sugar Mills Association, India, Dr. Rene K.F.G. Kee Kwong, Director, Mauritius Sugar Industry Research Institute, Dr. TSG Lee, UFSCAR, Brazil, Dr. Yong-Bao Pan, USDA-ARS, USA, Dr. Raffaella Rossetto, APTA Brazil and Dr. Kathy Hurley, Canegrowers, SA. Many national and international sponsors of the conference presented their speeches. The day was ended with a spectacular show of Indian Cultural Dances, collectively known as "Satrangi" (seven colors) which was enjoyed and appreciated by all foreign delegates.

With the elemental theme "Balancing Sugar and energy Production in Developing Countries: Sustainable Technologies and Marketing Strategies", all the sessions started on 22<sup>nd</sup> November and continued till 23<sup>rd</sup> November, 2011 followed by a valedictory session. In total, 218 original research papers were accepted for presentation, of which 115 papers were presented orally while 63 papers were presented in poster session.

On 24<sup>th</sup> November, 2011, all the delegates visited Simbaholi sugar Complex, one of the most modernized and high tech sugar Complexes. Followed by visiting sugar mill and distillery, delegates visited sugarcane fields and advanced high yielding Indian varieties.

A visit to Agra, City of Tajmahal, was also organized and the delegates were astonished yet delighted to see the beauty of this unique monument.

### *Glimpses of IS 2011, New Delhi*



## SUGAR INDUSTRY EVENTS AND NEWS

### International Conclave on Sugar Crops “Sweeteners and Green Energy from Sugar Crops : Emerging Technologies”

The Conclave was organized at Indian Institute of Sugarcane Research (IISR), Lucknow, India during 15-17 February 2014 by the Society for Sugar Research and Promotion (SSRP), in collaboration with Indian Institute of Sugarcane Research (IISR), Lucknow, National Sugar Institute (NSI), Kanpur, Vasantdada Sugar Institute (VSI), Pune, Sugar Technologists Association of India (STAI), Association of Sugar Technologists of India (ASTI) and IAPSIT. About 25 international delegates from various sugarcane growing countries like Brazil, Australia, China, Vietnam, Uganda, South Africa, Sri Lanka, and 150 delegates from India participated in the Conclave. A National SugarFest was also organized during the period to commemorate the 62nd Foundation Day of Indian Institute of Sugarcane Research, Lucknow. The event provided an excellent opportunity for the delegates, both national and international, to get a taste about the cultural richness of India especially of Uttar Pradesh.

A compilation of scientific articles and abstracts on different aspects of sugar crops production, management and marketing “The Power of Sugar Crops” was released during the occasion. In his inaugural address, the Chief Guest Dr Swapan K Datta, Deputy Director General (Crop Sciences), Indian Council of Agricultural Research, New Delhi urged the sugar producing countries to imbibe the experiences of Brazil in its successful Ethanol Programme and other endeavours, and to utilize the untapped potential of sugar crops. In the Special Lecture that followed, Dr Rafaella Rossetto from Brazil gave an overview of the Ethanol Programme at Brazil, where

the fuel blending is upto 40 %. This was followed by the formal inauguration of the SugarFest activities jointly by Dr Swapan K Datta DDG (Crop Sciences) and Dr Rafaella Rossetto from Brazil. Various competitions for school and college students and for house wives were conducted in a well planned manner. Agri-tourism activities were also flagged off.

A few recommendations emanated from the deliberations. The productivity of sugar crops and including sugarcane needs to be improved tremendously to meet the future demands and the industry should work towards this goal at the global as well as regional levels. R&D challenges in sugar crops need to be taken up with a clear cut focus, renewed approach, newer tools etc., in a multidisciplinary, collaborative and holistic manner. Sustainable-economic, social as well as environmental- and profitable production and management practices are the need of the hour with respect to sugarcane and other sugar crops. Improvement in productivity and sugar recovery needs to be taken up in these contexts. New economically feasible processes for bioethanol production need to be tried. Crop diversification and quality research on perennial sugar crops need to be taken up.

This was followed by a visit to Haidergarh Chini Mill, Haidergarh. A team of 50 delegates visited the mill where they got an excellent opportunity to see for themselves, the developments at the sugar factory level. They returned with a resolve to take home with them all the good experiences of the visit and also of the Conclave.



## Sugar Industry News

### Indian sugar output likely to rise 4 per cent in 2014-15 season

Despite a deficient monsoon, sugar production in the country is expected to go up by 4 per cent in the 2014-15 season as higher yields in Maharashtra and Karnataka and an increase in areas of cane cultivation in the two states make up for an overall decline in sugarcane acreage from the previous year. As per the satellite images, the sugarcane crop acreage in the states of Maharashtra and Karnataka is higher, even though the acreage in Uttar Pradesh and Tamil Nadu has declined. Maharashtra and Karnataka are showing higher cane acreage and have better cane yields and sugar recoveries while the sugarcane acreage in UP and Tamil Nadu is lower as per the Indian Sugar Mills Association (ISMA).

### New approach to boosting biofuel production

Yeast are commonly used to transform corn and other plant materials into biofuels such as ethanol. However, large concentrations of ethanol can be toxic to yeast, which has limited the production capacity of many yeast strains used in industry. Toxicity is probably the single most important problem in cost-effective biofuels production, according to Gregory Stephanopoulos, the Willard Henry Dow Professor of Chemical Engineering at MIT.

Prof. Stephanopoulos and his group at MIT and the Whitehead Institute for Biomedical Research have identified a new way to boost yeast tolerance to ethanol by simply altering the composition of the medium in which the yeast are grown, which could have a significant impact on industrial biofuel production.

Ethanol and other alcohols can disrupt yeast cell membranes, eventually killing the cells. The MIT team found that adding potassium and hydroxide ions to the medium in which yeast grow can help cells compensate for that membrane damage. By making these changes, the researchers were able to boost yeast's ethanol production by about 80 percent. They also showed that this approach works with commercial yeast strains and other types of alcohols, including propanol and butanol, which are even more toxic to yeast.

### Vivergo facility in U.K. to produce Biobutanol

Biobutanol is an advanced biofuel that has many benefits over ethanol when blended with gasoline. It can be produced using existing feed stocks such as sugar cane, wheat or corn as well as the feed stocks of tomorrow, including dedicated energy grasses. Biobutanol can be blended with gasoline at higher percentage than ethanol and used in existing vehicles without requiring engine modifications. We expect this to help speed up the introduction of biobutanol into the market.

Technology which can produce biobutanol cost effectively at commercial scale could encourage wider use of biofuels and help countries around the world to meet their greenhouse gas reduction targets sooner. In future, ethanol production plants, will be retrofitted to produce biobutanol. The Vivergo plant, located in Hull, UK, will produce 420 million litres of bioethanol a year at full capacity. As well as being the biggest bioethanol producer, Vivergo Fuels is the largest single-source supplier of animal feed, a natural co-product of the biofuel production process. When the technology is ready to produce the advanced biofuel Biobutanol at commercial scale, the partners will look to convert the Vivergo facility to produce Biobutanol using the Butamax™ proprietary technology process.

Biobutanol has all the benefits of ethanol and offers significant additional benefits. It can be blended with gasoline at higher concentrations than ethanol for use in standard engines

vehicles – a mix that can potentially reduce greenhouse gas emissions twice as much as the current maximum 10 % ethanol. It has a superior energy content to ethanol – delivering better fuel economy and miles per gallon for consumers. It produces lower VOCs (volatile organic compounds) than ethanol when blended with gasoline.

### Drought, lower yields reduce cane supply for 2014-15 sugarcane season in South-Central Brazil

The Brazilian Sugarcane Industry Association (UNICA), in conjunction with other producer associations in Brazil's South Central region and the Center for Sugarcane Technology (CTC), announced its estimate for the 2014-15 sugarcane harvest. The projection indicates a cane crush of 580.00 million tons, a 16.94 million ton reduction from the 2013-14 crush of 596.94 million tons. The projection reflects an increase in the area available for harvesting but a significant drop in agricultural yields stemming from a long period of drought stretching from the end of 2013 into early 2014.

Agricultural yield is expected to drop by around 8% compared to 2013-14, when the yield was 79.8 tons of sugarcane per hectare. With that drop being greater than the increase in the harvested area, the amount of sugarcane processed in 2014-15 is expected to be about 2.84 % less than in 2013-14.

### Rangarajan Committee on Deregulation of Sugar Sector in India

The key recommendations of Dr C Rangarajan Committee on sugar decontrol are positive and in line with the Indian sugar industry expectations. Adoption of these recommendations by the Central Government could transform the domestic sugar industry. The key recommendations are: Sugarcane pricing should be rationalized and the sugar trade liberalized in a calibrated phase-wise manner over a 2-3 year period. Levy sugar obligation and administrative control on non-levy sugar should be immediately dispensed with. The states should dispense with regulations regarding cane area reservation and bonding over the long run, and as the states discontinue reservation area, the center should dispense with the minimum distance criterion.

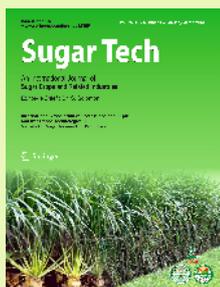
### Global Sugar Production

Global sugar production for 2014-15 is forecast flat at 176 million metric tons (raw value) as a reduction in Brazil is mostly offset by growth in India. With abundant supplies continuing to weigh on the market, global consumption is forecast to rise as demand in India and China expand. Trade is down slightly as lower exports from Brazil and Mexico are only somewhat offset by Thailand. Global sugar production is projected to increase by 1.9 % p.a. over the projection period and to reach nearly 216 Mt by 2023, an increase of around 36 Mt over the base period. Most of the increase in production will originate from countries producing sugarcane rather than sugar beet, and is attributed to higher yields rather than area expansion, even though yields will continue to flatten in the short term. Global sugar consumption is projected to increase by 1.9 % p.a., much slower than in the previous decade, and will reach 211 Mt in 2023. Growth in consumption of sugar will continue to be dominated by the sugar deficit regions of Asia and Africa.

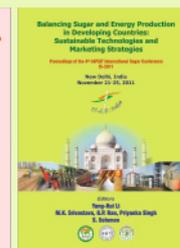
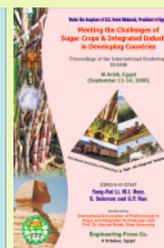
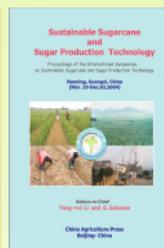
### World sugar production, consumption and global surplus forecasts for 2013/2014 (mTRV)

	Production	Consumption	Surplus
Czarnikow	184.0	181.1	2.9
KINGSMAN	180.2	175.4	4.8
ISO	182.7	178.8	4.0
F.O.Licht	181.2	175.6	3.1
USDA	175.7	168.7	1.5

## PUBLICATIONS OF IAPSIT



1. **Sugar Tech** - An International Journal of Sugar Crops and related industries, Published quarterly by Springer.
2. **Sustainable Sugarcane and Sugar Production Technology** (Eds. : Yang-Rui Li and S. Solomon) China Agriculture Press, Beijing, China, 2004, Price US \$ 80.



3. **Technologies to Improve Sugar Productivity in Developing Countries** (Eds. : Yang-Rui Li and S. Solomon) China Agriculture Press, Beijing, China, 2006, Price US \$ 80.
4. **Meeting the Challenges of Sugar Crops & Integrated Industries in Developing Countries** (Eds. : Yang-Rui Li, M.I. Nasr, S. Solomon and G.P. Rao) Engineering Press Co., Cairo, Egypt. 2008, Price US \$ 100.
5. **Balancing Sugar and Energy Production in Developing Countries: Sustainable Technologies and Marketing Strategies** (Eds. Yang-Rui Li, M.K. Srivastava, G.P. Rao, Priyanka Singh, S. Solomon, Army Printing Press, India. Price US \$ 125.

## BOOKS ON SUGARCANE AND SUGAR INDUSTRY

1. **Sugarcane : Production Management & Agro-Industrial Imperatives:** Eds. S.Solomon, S.S. Grewal, Yang-Rui Li, R.C. Magarey & G.P. Rao. International Book Distribution Co., India, Price US \$ 200.00
2. **Sugarcane Crop Production & Improvement:** Eds: S.B. Singh, G.P. Rao, S. Solomon & P. Gopaldasundaram, Studium Press LLC, USA 2009 Price US \$ 125.00
3. **Sugarcane Crop Management:** Editors: S.B. Singh, G.P. Rao & S. Eswarmoorthy, Studium Press LLC, USA 2003, Price US \$ 125.00
4. **Sugarcane Pathology Vol.I. Fungal Diseases:** G.P. Rao, A. Bergamin Filho, R.C. Magarey & L.J.C. Autrey, Science Publishers, Inc, USA Price US \$ 86.00
5. **Sugarcane Pathology Vol.II. Virus & Phytoplasma Diseases:** G.P. Rao, R.E. Ford, M. Tomic & D.S. Teakle Science Publishers Inc, USA, Price US \$ 60.00
6. **Sugarcane Pathology Vol.III. Bacterial and Nematode Diseases:** G.P. Rao, Philippe Rott and S. Saumtally, Science Publishers Inc, USA Price US \$ 95.00
7. **Cane Sugar: Production Management:** Eds: S.Solomon, H.N. Shahi, A.P. Gupta, G.P. Rao and B.L. Srivastava, International Book Distribution Co., India , Price US \$ 50.00
8. **Sugarcane: Agro-Industrial Alternatives** (Eds. G.B. Singh and S. Solomon) Oxford IBH, India, Price: US \$ 50.

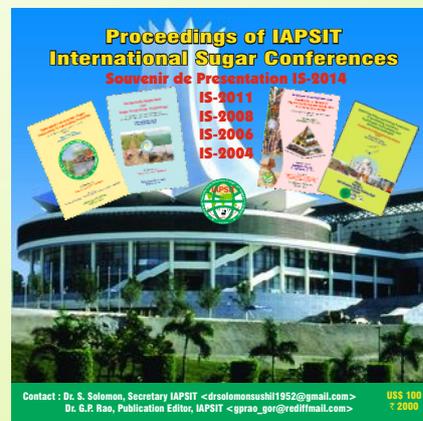
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## IS-2014 : PROGRAMME SCHEDULE

25 NOVEMBER 2014	
0800-0930	Registration of delegates – Conference Hall
0930-1030	<b>Inaugural Ceremony &amp; A Decade of IAPSIT</b>
1030-1100	Photo session
1100-1200	Plenary Lectures
1200-1400	<b>Lunch</b>
1400-1800	Plenary Lectures
1830-2100	<b>IAPSIT Celebration Dinner</b>
26 NOVEMBER 2014	
0900-1200	<b>Concurrent Sessions</b> <b>Session 1:</b> Sugar Crops Production Technologies and Mechanization <b>Session 2:</b> Sugar Crops Improvement and Protection Technologies <b>Session 3:</b> Sugar Crops Processing & diversification strategies; Sugar-energy Matrix in Developing Countries.
1200-1400	<b>Lunch</b>
1400-1800	<b>Concurrent Sessions</b> (Fixing of Posters in Main Hall)
1830-2100	<b>Dinner</b>
27 NOVEMBER 2014	
0900-1100	<b>Interactive Session ( Venue: Main Hall)</b> (Poster Presentation)
1130-1230	<b>Lunch</b>
1300-1800	Visit to Sugar Mill
1830-2100	<b>Dinner</b>
28 NOVEMBER 2014	
0830-1000	Visit to Experimental Site of Sugarcane Research Institute (CSRC) & Variety Demonstration Field
1030-1200	Technical Sessions 1/2/3
1200-1400	<b>Lunch</b>
1400-1530	Valedictory Session
1530- 1830	City Tour*
1830-2100	<b>Farewell Dinner</b> <b>IAPSIT EC Meeting at 1700 (only for EC Members)</b>

\*Provisional programme subject to change

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