Speech of Dr APJ Abdul Kalam at World Tea Science Congress of TRA

I am happy to participate in the inauguration of the World Tea Science Congress of Tea Research Association (TRA) here in Jorhat, Assam. I am glad to know that this conference is being organized as a part of the centenary celebration of the Tocklai Experimental Station to address the contemporary issues of Tea Industry. Friends, what does it mean, organization like Tocklai Experimental Station completing 100 years. The earth where we live, rotates its own axis and also orbits around the Sun . You all know that when we complete one orbit around the Sun it takes one year. That means Tocklai Experimental Station has completed 100 orbits around the Sun this year. My heartiest congratulations to all the team members and the pioneers who have contributed to the growth of this great institution. My greetings to all the researchers, cultivators, scientists, experts and other distinguished guests present here.

Friends, tea is one of the most historic beverage - served in many form. In India, with over 800 million kgs of consumption, tea is a major part of our beverage, across the nation and in many different forms. Of course, with changing market dynamics, agro processing technologies and diversifying markets, there is a need for redefining the tea industry. With that perspective, the topic I would like to discuss with all of you today is"Dimensions of Indian Tea Industry".

Every Tea is Unique

When I am with tea experts, I would like to share one of my personal experience. I am now in the 81st orbit around the Sun. One thing I have realized is that nobody in my country and abroad can prepare a tea perfectly to my specification. Hence, I have decided, I have to prepare a tea for myself wherever I go. To my great surprise, one day in an airline in India, a crew member gave me tea to my exact specification. Now you all would be interested to know what is the type of tea I like? In our country, there is one system, particularly in the northern side, where they fill the cup with milk and the tea bags come separately. There I find only milk but no tea. After that, whatever number of tea bags I use, the colour you get only is white. Now you know, why I prepared tea for myself. Half cup of hot water with two tea bags, then I wait for some time and after stirring, I get the unique colour of tea and its fragrance. Then I mix with little milk and sugar. Now I hope all of you would like to drink what I prepare.

The reason I am telling this story, we don?t know how to market beautiful tea and its spin off products.. Even tea industry should be interested in marketing, which begins on how to prepare the tea.

My visit to Tocklai Experimental Station

Yesterday when I reached Tocklai Experimental Station, I had visited the model factory and witnessed how the plugged tea leaves are oxidized, processed in a multi stages and finally a pure and filtered tea is getting ready for distribution. What a wonderful process mechanism is established here which I have witnessed yesterday. Then I visited the Department of Biochemisty and its associated laboratory, where I saw the quality process and its standardization of parameters for the manufacturing process set at a pilot level which will be scaled to that extend in the actual manufacturing process later. Then, I went to the Tea tasting centre, where I witnessed number of tea products starting from tea candy, chewing tea

tablet, tea toffee, black tea tablet, tea biscuit, tea drink and other variant products and also different type of tea prepared for testing the taste of each variant. A great market potential exists for these tea products and its variants if it is commercialized and created a brand for its global marketing in association with the interested private industries.

I have interacted with the scientists in the pathology laboratory and visited the Entomology Department which involved in studies of bio-ecology of pests and crop loss, mass multiplication of predators, semio-chemicals, botanicals and eco-friendly chemicals, evaluation of new molecules, entomo-pathogens, resistance management. Also I have seen how the pests affects the tea plants in various ways and what are the different kinds of pests exists and also new pests are emanating which needs to be addressed in a unique way. Hence dear friends, what I feel is, the, it is time to change the name Tocklai Experimental Station into Tocklai Research Centre, bringing a major transformation effect giving more focus on Research and attract the participation of public private partnership for conducting research on TEA and its associated spin off products to meet the global demand and create a brand for itself. My greetings to all of you.

Indian Tea Industry

Friends, I am going to discuss Indian tea industry profile and possible winning transformations. It may be true and applicable for many other nations. As you all know India, with over 800 million kgs of annual tea consumption is the largest tea consumer in the world. More than 22% of the world tea is consumed in India and over 80% of the domestic production is used for the Indian market. Today, about one-fourth of the total tea production happens in India with a turnover of about Rs. 10,000 crores annually. With over 50% of the workers being women, the Indian Tea Industry is also the single largest employer of women as a sector in the nation. With such a context, and a historic background, it is no exaggeration to say that Tea is indeed a National Drink of India and needs to be positioned as core strength of Indian agro sector. Of course, we need to analyze the challenges and evolve a comprehensive strategy to achieve this mission.

Present Issues and Solutions

Friends, in the year 2010, I had a surprise during my teaching assignment at Gatton College of Business and Economics, Lexington, USA. I had 62 PG students in multi-disciplines for whom, I took a 15 day course, on the subject of "Evolving Happy, Peaceful and Prosperous Societies" by deploying technology. In that course, students were to form small team of 5 members each, cutting across multiple disciplines and analyze a ground level problem from national and international perspective. The first day itself, all the 12 groups submitted the projects to me narrating what they specialized in the course. One project that attracted my attention was "The state of Indian Tea industry and why it declined from the number one position and possible solutions". All the students were of American origin, and amount of data they have collected from various sources of tea industry in the world, the method of cultivation, harvesting and production of tea, and marketing, was truly impressive. The students even knew about the cropping cycles in India and the technological gaps which existed. And above all, the students are aware, how many small and large scale tea industries are here in India. Of course, my course was assisted by two of

my friends, Shri Srijan Pal Singh and Dhan Shyam Sharma. My students highlighted the following important aspects: The group?s findings are:

1. First, until 1989, India was the largest exporter of Tea in the world. Today it has slid to the 4th position.

2. Second, it is a fact that until 2005, India was the largest producer of tea and then was surpassed by China. Today, India the production is about 966 million kgs is which is about 30% lower than China at 1370 million kgs

3. The world tea pricing shows that Indian Tea is among the low revenue earner per kg than the international competitors. In 2007, Export Price of Indian Tea was at $2.45 per kg while Sri Lanka was $3.26 per kg and Japan was $16.47 per kg. However, Indian tea is definitely rated as the best in quality and has tremendous potential for higher price based on quality and value addition. You tea friends from India have to market Indian tea in a winning way.

4. The per capita yield of the Indian Tea Industry is low. The yield per hectare is currently at about 1693 Kg per Hectare with significant variations from state to state. The per worker yield of Tea is also quite low at about 780 kg per worker per year yielding about Rs. 80,000 turnover per person. One of the key concern is the small farm sizes, which make the employment of machinery and technology infeasible

I told the students, that I am going to take a course on the subject called PURA (Providing Urban Amenities in the Rural Areas), where I would like to give solutions of some of the problems raised by the students on low productivity. I said, PURA also advocates a cooperative movement, so that the small growers come together for cultivating large area of tea industry and work together in harvesting, storing and marketing. And most important, the cooperative societies will be the outlet for the quality saplings and quality fertilizers and quality pesticides with instruction when to plant and when to go for sprinkler irrigation with what fertilizers mix and how to monitor onset of pest and prevent it using the pesticides. Also, the training to the growers and workers especially women in the tea industry on how to plant, how to grow, how to harvest, when to harvest the tea leaves and how to store? My students then sharpened their project with PURA system and brought out project report highlighting how big tea industries has to have high productivity, how small industries using PURA system and cooperative movement will equally increase the productivity. After about 2 weeks of discussions and presentations, we came up with the following solutions:

1. Empower the Indian Small Tea growers with standardization on plantation, education to be more competitive with sustainable production, storage methods, transportation both domestically and internationally. This can be done as a knowledge connectivity of PURA model.

2. More efficient farm tools for plugging the tea leaves and other forms of cultivation, harvesting, and collection process, capital needs to come from the government in the form of low interest loans to be paid off over a long periods of time. Cooperative banking and microfinance can be the key in this area.

3. Cooperatives in the tea sector similar on the lines of the sugar cooperatives in western India. This would improve the land holding size and ensure tea processing is managed by the grower to increase their profits and yield

4. Innovation with value addition in tea products and marketing exotic productions like medicinal tea, organic tea and flavored tea.

5. Social entrepreneurship for the tea industry and its farmers. This would also include provision for better education and healthcare.

As I told, one of the key models which we discussed was the evolution of a Tea Cooperative PURA (Providing Urban Amenities in Rural Areas) program in the tea production areas of the nation which would undertake integrated development of the product, process and marketing of tea and also give initiatives of social development of the tea cultivators in the region. With the cooperative architecture the farmers would be able to absorb the benefits of large farm size without losing their earnings and also participate in tea processing to enhance their income.

Understanding PURA

PURA involves four connectivities namely Physical, Electronic and Knowledge leading to Economic connectivity. The mission of PURA, apart from concentrating on reinforcing tea agriculture, will emphasize on tea processing, development of Rural Craftsmanship, other allied rural products so that the non-farm revenue for the rural sector is enhanced, based on the core competence of the region. Also the rural economy will be driven by renewable energy such as solar, wind, bio-fuel and conversion of municipal waste and forest waste material into power. In this approach, the task is to make sustainable development using the core competence of the rural sector.

In the past, government, private and public sectors have been taking up rural development in parts. For example, starting education institutions, starting a healthcare centers, laying roads, building houses, building a marketing complex, giving a communication link in a particular rural area have been taken up in the past as individual activities. During the last few decades, it is our experience, that these initiatives starts well, just like heavy rain resulting into multiple streams of water flow. As soon as the rain stops, few days later all the streams get dried up because there is no water bodies to collect the surplus water and store it at the right place. For the first time, PURA envisages an integrated development plan with employment generation as the focus, driven by provision of the habitat, healthcare, education, skill development, physical and electronic connectivity and marketing.

Let me discuss briefly the model of a typical PURA.

PURA: connectivities which lead to it

PURA essentially requires four levels of connectivity which have to be customized according to local competencies and needs. It means that:

1. The villages must be connected with in themselves and with main towns and metros through by good roads and wherever needed by railway lines. They must have other infrastructure like schools, colleges, hospitals and amenities for the local population and the visitors. This is physical connectivity.

2. In the emerging knowledge era, the native knowledge has to be preserved and enhanced with latest tools of technology, training and research. The villages have to have access to good education from best teachers wherever they are, must have the benefit of good medical treatment, and must have latest information on their pursuits like agriculture, fishery, horticulture and food processing. That means they have to haveelectronic connectivity.

3. Once the Physical and Electronic connectivity are enabled, the knowledge connectivity is enabled. That can facilitate the ability increase the productivity, the utilization of spare time, awareness of health welfare, ensuring a market for products, increasing quality conscience, interacting with partners, getting the best equipment, increasing transparency and so in general knowledge connectivity, that progresses core competence of the rural environment with additional to technology. Hence, these three connectivities integrated way lead to economic connectivity.

4. Once the three connectivities viz Physical, Electronic and knowledge connectivity are ensured, they facilitate earning capacity leading to economic connectivity. When we Provide Urban Amenities to Rural Areas (PURA), we can lead to upliftment of rural areas, we can attract investors, we can introduce effectively useful systems like Rural BPOs, Micro and small-scale industries.

The number of PURA for the whole country is estimated to be 7000 covering 600,000 villages where 750 million people live. There are number operational PURA in our country initiated by many educational, healthcare institutions, industry and other institutions. Government of India is already moving ahead with the implementation of PURA on the national scale across several districts of India.

Typical Working Cooperative PURA

It is possible to get an insight of PURA by studying few of the operational PURAs which are functioning in different parts of the country. They are: Periyar PURA, Loni PURA, Chitrakoot PURA, Meenakshi PURA and Warana PURA. Let me highlight few aspects of Warana PURA. Earlier, I had mentioned the need to evolve

a cooperative based tea PURA. Let me now give you an example of a cooperative based PURA in western India which can be a case study for the similar deployment in the tea plantation regions.

Warana PURA: Farmer cooperative in action

Friends, in March 2010 I was in the Warana valley of Kolhapur district. The Warana PURA mission began as a sugar cooperative movement, as a vision of a great social leader called Sah-kaar-shri Tatyasaheb Kore in 1950s to transform the Warana region which was a backward area infested with unlawful activities. The Warana PURA has since then evolved on a cooperative framework and implemented sustainable models based on the core competencies of the rural areas covering 69 villages and about 4 lakh people. This PURA model, which has more than 60,000 farmers, women entrepreneurs and villagers as their members, has been giving consistent dividend of over 25%. The Warana PURA programme has succeeded in creating income generation through value addition to sugar and dairy products, innovative agricultural practices and entrepreneurship, striving towards literacy and healthcare for all. For the welfare of landless villagers, Tatyasaheb Kore envisioned and pioneered the creation of the Warana Poultry and Warana Cooperative Dairy with more than 16000 milk producers spread over 60 villages.

Similarly, the Warana PURA has also initiated cooperative educational institutions, retail outlets and hospital for better standards of living. The Waran PURA is an example of how integrated development can be achieved through a strongly knit cooperative structure with value addition and economic empowerment.

I suggest the experts present here to study the tea plantation PURA in the state of Assam that will transform into an economic and societal change complex and bring the prosperity to this region. Let me now talk about one experience which may be useful to you to protect the tea crops from pests and also helps to increase the productivity of the tea crops.

Genetic research for avoiding pests and productivity increase in TEA

I had visited Dr. Henry Daniell, University of Central Florida, College of Medicine, Orlando, Florida in 2010 and interacted with him and his research team. http://daniell.ucf.edu; daniell@mail.ucf.edu) I had an interesting thing to share with you, when I visited the TRA Laboratory yesterday I saw the different type of pests which affects the tea leaves and also the understood the low productivity of tea crops. Mainly Sap-sucking insects are among the most devastating insect pests worldwide. Many species are serious pests of agricultural and horticultural crops worldwide. Some of the most serious damage caused by these pests is due to their role as vectors of plant viruses. It is well known that tri-chomes secrete secondary meta-bolites that are toxic to insects.

Therefore, in Dr Henry Daniell Lab, plants were genetically modified with a single foreign gene (?-glu-co-si-dase) to enhance biomass and confer other valuable agronomic traits. Expression of ?- glu-co-si-dase in

plant chloroplasts doubled the plant biomass (190%) than unmodified plants, increased leaf area (160%), inter-node length (180%), height (145%) and glandular tri-chomes in the upper (1033%) and lower leaf surface (765%).

In addition, when plants were confined to an insect-proof nylon mesh bag after introduction of newly emerged whiteflies or neonatal nymphs for 25 days, there were 1838% more whiteflies and 1496% more aphids on untransformed plants than genetically modified plants. That means insects naturally avoid these genetically modified plants. In addition to doubling the biomass and protecting plants from harmful insects, these genetically modified plants produce low cost ?- glu-co-si-dase, a thousand fold less expensive than currently available technologies.

Hence, TRA may work with Prof. Henry Daniell, University of Central Florida, USA and see how you can use the genetic modification or identify any other enzyme which is suitable for protecting tea leaves from pests and also increase its biomass without losing the characteristics of tea and its fragrance.

Let me now suggest some mission in the tea research area which would be important for resurgence of the tea industry.

Missions for Tea Research Association (TRA)

1. There should be a dedicated research fund which should be enhanced progressively from the present 0.16% of revenues to 1% in 5 years and 2% subsequently. We must remember that multi-dimensional research will be the key to increase our turnover from Rs. 10000 crores to Rs. 30000 crores (based on today price) annually in the next ten years. TRA should attract private investment for TEA research as a part of the CSR initiatives from Indian and multinational companies so that the government provides an equal contribution for R&D and commercialization in all aspects of TEA.

2. There is a need for research of tea varieties which can give higher yields even with variations in agro climatic conditions. It is noteworthy that, the productivity of tea across India varies from 2400 kg per Ha (in Karnataka) to about 1500 Kg per Ha (in Kerala and Assam). Even with Assam, the variation from 700 to 2100 Kg/Ha across different regions. I was happy to learn that the Tea Research Association is already engaged in the mission of developing the Lengree 51 and Lengree 56 tea cultivars which are suited to drought prone areas.

3. Research also needs to be conducted to make the production of tea an eco-friendly and a sustainable agro practice. I am happy to know that TRA is conducting significant research in techniques to protect the top soil from eroding in various hilly tea gardens in the nation

4. There is a need to develop Indian brand of exotic and medicinal tea which internationally competitive and is unique to India. This would also require an emphasis on quality control, improving color, flavor and packaging.

5. To enhance the revenue per farm, we need to develop and deploy tea friendly crops if any, which can lead to multi cropping from the same farm. I was happy to learn that the TRA is developing the technique of Cleft grafting which is a cost effective way for conversion of old tea area with a new clone

6. Conduct research to establish medicinal qualities of different varieties of tea and develop nutraceutical products. Also, a comprehensive international marketing strategy may be developed in collaboration with IIMs and other elite institutions.

Conclusion

Friends, I have seen three dreams which have taken shape as vision, mission and realization. Space programme of ISRO (Indian Space Research Organization), AGNI programme of DRDO (Defence Research and Development Organization) and PURA (Providing Urban Amenities in Rural Areas) becoming the National Mission. Of course, these three programmes succeeded in the midst of many challenges and problems. I have worked in all these three areas. I want to convey to you what I have learnt on leadership from these three programmes:

a. Leader must have a vision.

b. Leader must have passion to realize the vision.

c. Leader must be able to travel into an unexplored path.

d. Leader must know how to manage a success and failure.

e. Leader must have courage to take decisions.

f. Leader should have nobility in management.

g. Leader should be transparent in every action.

h. Leader must work with integrity and succeed with integrity.

For success in all your missions you have to become creative leaders. Creative leadership means exercising the vision to change the traditional role from the commander to the coach, manager to mentor, from director to delegator and from one who demands respect to one who facilitates self-

respect. For the prosperous and developed Tea industry, the important thrust will be the availability of number of creative leaders who will integrate production, processing and marketing of tea.

At this stage let me recall Maharishi Patanjali?s words stated about 2,500 years ago:
"When you are inspired by some great purpose, some extraordinary project, all your thoughts break their bounds. Your mind transcends limitations, your consciousness expands in every direction, and you find yourself in a new, great and wonderful world. Dormant forces, faculties and talents come alive, and you discover yourself to be a greater person by far than you ever dreamt yourself to be."

With these words, I inaugurate the World Tea Science Congress at Jorahat. My greetings and best wishes to all the members present here for their mission of realizing a resurgent tea industry in the nation and world.

May God Bless you.

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