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**TECHNOLOGY AND ECONOMY FOR
NATIONAL DEVELOPMENT:
Technology Leads to Nonlinear Growth**

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Former President of India**



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INTRODUCTION

Friends, I am happy to deliver the 7th SAGE-MSE Endowment Lecture. My greetings to all of you. I am indeed happy that Madras School of Economics (MSE), established in 1995 has crossed many milestones and now is offering a Five Year Integrated M.Sc. Programme in Economics in addition to 5 M.Sc. degree programmes in collaboration with Central University of Tamil Nadu. The MSE has focused PhD programmes in collaboration with University of Madras and the Central University of Tamil Nadu. As a premier professional institution focused on economic progress, the MSE can facilitate the dissemination of the knowledge and create "Consilience" process among various segments of the society, be it social economics, scientific, technical, political or journalistic. It involves synthesis of knowledge from different specialized fields of human endeavor for human progress. In a matured society, different views are essential to move towards citizen-centric, constitution guided policy directions. Hence, I have chosen the topic of "Technology and Economy for National Development".

NURTURING THE SEEDS

Friends, when I see you all, I recall an incident in the year 2001, when I was teaching at Anna University, Chennai a course on "Societal Transformation using Technology". I was invited by the Presidency College of Chennai to interact with students. When I reached the venue, I saw more than 1500 students overflowing the hall. It was very tough to reach the dais. After I finished my lecture "**Vision Elevates the Nation**", I received a number of questions from the students, which I answered. When I was leaving the hall, suddenly a young student pushed himself from the crowd and thrust a crumpled paper in my hand. I put the paper in my pocket and read it in the car, while I was returning to Anna University. My mind got elevated with the power of the message from T. Saravanan doing M.Phil in Presidency College at that time. I would like to share the content of the letter with all of you, since it is relevant to the subject we are going to discuss. The letter went like this:

"Dear Sir, the full power of banyan tree is equal to the power in the seeds of the tree. In a way both of us, you and me are the same, but we exhibit our talents in different forms. A few of the seeds become banyan trees but many seeds die as saplings without ever becoming a tree. Due to certain circumstances and environmental conditions, many

seeds even get damaged and become part of the soil as manure helping new seeds to become trees.”

Saravanan then asked, “You have worked for the county and helped many scientists, engineers, and knowledge workers, can you tell me, how you ensured that their abilities were not wasted or their growth was not stunted pre-maturely like seeds that never became trees? In your service, what is the percentage of success you can claim?”.

I suitably answered Saravanan and added that it was my great joy to see my team members excelling in knowledge and action. Since Saravanan wanted to know the percentage of success. I replied that it could have been 60%. But this 60% emerged out of the 100% who worked for the projects.

The message I would like to give is, the seeds of banyan tree are indeed something like the citizens of the nation. Democracy gives opportunity to every citizen to grow with capacity to perform. Every citizen indeed contributes to the success of the few. Let the success of India be shared by all Indian citizens. Let every seed nurture. Nevertheless, seeds that become manure must not be treated lesser than the seeds that become trees.

NATIONAL DEVELOPMENT AND CHALLENGES

Friends, what a phenomenal transformation that has taken place in the society during the 20th century and the early 21st century, as we see now! India has made considerable progress in many areas: Science and Technology have revolutionized agriculture and we are producing over 260 millions tonnes of food-grains from ship to mouth condition in the 1960s. Our space scientists have provided space communication and space remote sensing for societal application of the country. Apart from this they have successfully placed the Chandrayaan in the Lunar Orbit and the MARS orbiter moving towards the planet. Our pharmaceutical industries are producing large quantity of drugs competitively. Our ICT and Pharmaceutical industries have built a national strength with large export potential. The automobile industry has made great progress. We have made considerable progress in transportation, our tele-density is over 85% and there is qualitative improvement in healthcare, education and justice delivery system. The media is vigilant. There are a number of individuals and NGOs who have taken to good causes. Our judiciary and legal system are rising to the challenges of time. However it is also

true that the country is passing through severe challenges. We are facing the turbulence in our economic growth induced by global economic system. While nations are working to improve the lot of people and leap frog in development, there are forces at work to impede by way of extremism and terrorism. The synergy of technology, society and values is all about preserving the values, understand the lessons from the past and build a strong foundation for the development and growth of a nation giving due respect to the freedom of the individuals and without infringing on other's freedom, perform one's duties and responsibilities. Society has to be dynamic to make progress and prepare itself for the challenges of the future with appropriate derivatives of technology.

Friends, we need Economic development, which need to reach the entire population. When we are studded with many social challenges, science and technology tools are required to make path making economic development. We have seen how many in roads had been made by science and technology in various social sectors. First green revolution required scientists, farmers and administration to synergise together. Telecommunication and space have brought together people from all parts of the nation and the globe. Railways and highways have interconnected people from length and breadth of the country. Technology has enabled a smooth process of election of people's representatives, which is among the first steps in democracy. Technology has made possible many medical solutions not heard of till recently. There is no area where technology has not made its presence. Still there is lot to do.

Friends, I have been presenting in many forums, the pillars of development profile for the nation in 2020 as follows.

DISTINCTIVE PROFILE OF INDIA BY 2020

- (1) A Nation where the rural and urban divide has reduced to a thin line.
- (2) A Nation where there is an equitable distribution and adequate access to energy and quality water.
- (3) A Nation where agriculture, industry and service sector work together in symphony.
- (4) A Nation where education with value system is not denied to any meritorious candidates because of societal or economic discrimination.

- (5) A Nation, which is the best destination for the most talented scholars, scientists, and investors.
- (6) A Nation where the best of health care is available to all.
- (7) A Nation where the governance is responsive, transparent and corruption free.
- (8) A Nation where poverty has been totally eradicated, illiteracy removed and crimes against women and children are absent and none in the society feels alienated.
- (9) A Nation that is prosperous, healthy, secure, devoid of terrorism, peaceful and happy and continues with a sustainable growth path.
- (10) A Nation that is one of the best places to live in and is proud of its leadership.

INTEGRATED ACTION FOR DEVELOPED INDIA

To achieve the distinctive profile of India, we have the mission of transforming India into a developed nation. We have identified five areas where India has a core competence for integrated action: (1) Agriculture and food processing (2) Reliable and Quality Electric power, Surface transport and Infrastructure for all parts of the country. (3) Education and Healthcare (4) Information and Communication Technology (5) Self-reliance in critical technologies. These five areas are closely inter-related and progressed in a coordinated way, will lead to food, economic and national security.

I would like to see for yourselves how an integrated approach of technology, economics and values for a better societal future can serve each one of the development pillars. Ultimately the development has to reach the bottom of the pyramid. How economy, environment, science and technology can help achieve this mission? Let us see how to enrich the bottom of the pyramid.

ENRICHING THE BASE OF THE PYRAMID

The research results of the science and technology have to benefit the people with pollution free environment, green environment, safe drinking water and also water resources management. Zero waste discharge systems will not pollute the environment, using technologies which will reduce the carbon foot print. Use of renewable energy resources for achieving energy independence, use of navigational and resource mapping to maximize the use of mobile resources such as river flow for the optimal utilization of

water and ultimately improve the biodiversity by enriching the environment which is congenial for its growth to manage the life cycle balance. The sustainable technologies have to help to improve the quality living conditions of the people using the exiting natural resources sustainably for the generations cot come without any depletion of its resources using clean and green technologies. Then it is possible the sustainable development has reached the base of the Pyramid.

SOCIETAL DEVELOPMENT RADAR

It is essential to evolve the Development Radar to review and monitor how the science end technology has benefited the people. This would be the basis of our approach on development radar based on eight essential empowerment attributes which are critical to the realization of our goal a happy, prosperous and peaceful society beginning at the base of the pyramid. These traits are:

- (1) Food and nutrition
- (2) Access to water, both potable and irrigation
- (3) Access to Healthcare
- (4) Access to Income Generation Capacity
- (5) Access to Education and Capacity Building
- (6) Access to Quality Power and Communication Applications
- (7) State of Societal Conflict
- (8) Access to Financial Services

Economic, social scientists and thinkers had to refocus on how we are using technology of the 21st century to solve the problems which are reminiscent of perhaps the 19th and 20th century. We need to re-think on how the convergence of technologies at our disposal can solve some of the problems of the 70% of rural population of the India and help them unleash their potential thereby leading to better human life, without damaging the environment around us.

SUGGESTIONS FOR MSE

- (1) This premier institution can bring out some analysis and research papers integrating technology, society and values with respect to the development pillars for 2020 profile and beyond.
- (2) Can work on certain suggestions on curriculum from school level on this theme.
- (3) Today, more than 800 million people in India and in the world about 3 billion people, are living in villages, and hence any mission towards global prosperity and happiness has to be inclusive of the rural regions. As members of this premier institution for economics you can develop and research systems which can deliver sustainable economic development to the villages of India.
- (4) The world today is generating more than 30 Gigatons of CO₂ annually which is responsible for climate change and global warming. A large part of it comes as a consequence of economic expansion and energy growth. As experts on economics can you create a roadmap for green economic development for India, Asia and Africa.
- (5) There is a pressing need for networking of water bodies in the nation. This will give us a new smart waterway, free from multiple floods and droughts and help reduce the water availability gap in the nation. As economists, can you help develop a financial and cost-benefit analysis model for such an implementation across the nation?
- (6) The government of India has declared the important mission of developing 100 smart cities across the nation. You may like to study and generate a report on how the economic engine in these smart cities would operate.

NATIONAL ECONOMIC DEVELOPMENT AND CREATIVE LEADERSHIP

Friends, now I would like to talk about national economic development and creative leadership. I am connecting the competitiveness and creative leadership through certain well known methodology, you can participate in the evolution of competitive world to a creative leadership. Prosperity of the nation is empowered by economic development and great human character.

- A nation's Economic development is powered by competitiveness.
- Competitiveness is powered by knowledge power.
- Knowledge power is powered by Technology and innovation.
- Technology and innovation is powered by resource investment.
- Resource investment is powered by return on Investment.
- Return on Investment is powered by revenue.
- Revenue is powered by volume and repeat sales.
- Volume and repeat sales is powered by customer loyalty.
- Customer loyalty is powered by Quality and value of products.
- Quality and value of products is powered by Employee Productivity and Innovation.
- Employee Productivity is powered by Employee Loyalty.
- Employee Loyalty is powered by employee satisfaction.
- Employee satisfaction is powered by management innovation.
- Management innovation is powered by Creative leadership.

CONCLUSION: CREATIVE LEADERSHIP

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 would like 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 becomes the master of the problem, defeats the problem and succeeds.
- (i) Leader must work with integrity and succeed with integrity.

For success in all the missions, it is essential to have 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 evolving a sustainable economic system, we need the large number of creative leaders.

My best wishes to all the students and members of Madras School of Economics and SAGE for success in your missions.

May God Bless you.

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