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on

**Keeping Pace with Rapid Global Change –
India's Moment**

by

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Keeping Pace with Rapid Global Change – India’s Moment

*Dr Jayaprakash Narayan**

I am honoured to be with you to deliver the Valluripalli Venkata Rama Seshadri Rao Memorial 7th Annual oration, Gudlavalleru has been in the forefront of India’s quest for social cohesion, political vision, local initiative and empowerment, and self-reliance. More than four decades ago Gudlavalleru became a household name as an example to the rest of India. Thanks to the efforts of illustrious leaders like Sri Vallurupalli Venkata Rama Seshadri Rao, and the continuation of their legacy by enlightened citizens like Sri Vallurupalli Nageswara Rao garu, Gudlavalleru remains in the forefront of economic and social development in the Telugu-speaking region of India. I am particularly impressed with the unrelenting focus on skill development, local wealth creation and employment generation. It is such in-situ urbanization, transforming our rural, agricultural economy into modern industrial and service economy by integrating rural with urban and agriculture with industry, and promoting seamless transition without mass migration that holds important lessons for India’s future. I deem it a privilege to spend the day with you, and join the illustrious names that preceded me in this oration, the likes of Dr P V Indiresan, Dr Kota Harinarayana, Dr Sreedharan and Sri K V Chowdary.

I have decided to explore the theme of ‘keeping pace with rapid global change’ with good reasons. The world is witnessing unprecedented technological, economic and political change. Hitherto stable and strong nations and economies are now in the grip of these sweeping and disruptive changes. The world at large and India in particular, have to recognize that certainties of the post-second world war world have given way to volatility, uncertainty and potential instability in economies, politics and society. The mass migration to Europe from Syria and rest of West Asia, the cultural, political and social convulsions resulting from such migration, Brexit, the political earth quake of Donald Trump’s election as president in the US, increasing nationalism and isolationism

and aversion to global trade are all some of the more visible, dramatic manifestations of the change sweeping across the world.

India is not immune to these global changes. Our situation is infinitely more complicated by indigenous factors. The vast rise in unemployed youth, our need to find productive employment for a million young people every month, our continuing low productivity, endemic corruption and climate inhospitable to wealth creation, and our persistent and vast gulf between the potential and fulfillment – all these make Indian situation volatile and potentially destabilizing.

Over the past four decades, the dramatic rise of China has been the most significant global economic and political development apart from the collapse of communism and disintegration of the USSR. Having achieved three decades of unprecedented economic growth, China is now the world's largest manufacturer, exporter, employer and reservoir of foreign exchange, and is now second only to the US in terms of economic strength, military power, and global prestige and influence. Despite economic liberalization and impressive economic growth in the post-1991 era, India has still not been able to unlock her potential. Our employment generation is woefully inadequate, productivity remains low, corruption is endemic, power is centralized and education and healthcare are appallingly bad for a major nation.

These internal challenges are complicated by the global changes. The emergence of China as an economic power house has undermined manufacturing in most countries of the World. Even the US and most Europe felt the impact in the form of job losses and outsourcing of most routine manufacturing. Today China has huge surplus capacity with global demand tapering off. For instance 80% of all the World's window air conditioners are manufactured in China. Smart phones, rare earth minerals, semi conductors, steel, toys, electronic goods and most manufactured goods – in most of these sectors China is the undisputed leader, and it can meet the demand of most of the world at a low cost. Given the overcapacity built in China and dramatic cost reductions achieved, it is unlikely that another great manufacturing giant comparable to

China can emerge in the foreseeable future. Only Germany in Europe has largely retained its manufacturing industry. Even Japan, with its rise of median age of the population and reduction in working-age population, is impacted by global changes.

On top of these sweeping changes in global power relations, economy and trade, breath-taking technological innovation is transforming the world as we have known since the dawn of twentieth century. For over a century, automobiles and housing have been two of the key engines and indicators of economic growth. Mass manufacturing, economies of scale and arbitrage of cheap labour have been the norms over this period. Global trade grew dramatically based on Ricardo's theory of comparative advantage, specialization, lowering trade barriers and free exchange of goods and services.

The era of consumer goods and electronics saw refrigeration, air-conditioning, washing machine, television, computer and smart phone becoming everyday necessities in both developed world and emerging economies. All these goods along with satellite communication, internet and social media allowing free and instant flow of information and knowledge accessible to practically every human being have created a revolution of rising expectations. At the same time, as global productivity levels rose significantly, fewer and fewer people are able to produce more and more, finding productive employment for all working-age people has become a major global and national challenge. We are at the cusp of dramatic global and national convulsions on account of these changes.

All this dramatic change and accelerated pace of demographic, economic and political transformation are enough to make us feel giddy. Even without any other major technological breakthroughs, the contemporary challenges are both exciting and daunting. But the world does not stand still. We have witnessed three major industrial revolutions since 17th century. The First Industrial Revolution transformed stagnant, agrarian economies dependent on weather gods and human and draught animal muscle power and heralded the machine age. Fossil fuels, steam engine, automobiles and mass manufacturing were largely the consequences of this revolution. The advent

of electricity in lighting, running machines, house hold heating and appliances has made a direct and immediate impact on families and their homes. This was the Second Industrial Revolution. The Third Industrial Revolution has been characterized by electronics and computers, and has substantially reshaped the post-war world, and continues to dominate our lives and lifestyles.

Now we are beginning to see the Fourth Industrial Revolution which promises to reshape the world as we know even more dramatically and swiftly than before. This is a great opportunity in terms of technology, life styles and leisure, but also poses great challenges of transition in economic management and politics throughout the globe. Allow me to outline a few select features of this technological revolution beginning to sweep the world, so that we can appreciate the disruptive potential of the changes we are witnessing.

Ravi Venkatesan wrote: “The world is at the beginning of a revolution where there are huge advances in genomics, artificial intelligence, materials and manufacturing technologies. Machines are closing in on human ability with astonishing speed. Robots are replacing humans not just on factory floors but in homes too. Reusable rockets promise to make space travel and colonies on Mars and the moon a reality. Possibly in our own life time, we will reach a point called ‘singularity’ where machines become as smart as humans and then keep getting smarter. We will soon be able to edit genes to create favourable traits and new life forms. Science fiction is becoming reality”.

As Klaus Schwab of WEF said, “The Fourth Industrial Revolution is building on the Third, the digital revolution that has been occurring since the middle of the last century. It is characterized by a fusion of technologies that is blurring the lines between the physical digital and biological spheres”.

Undoubtedly nanotechnologies, biometrics and new advances in genetics will transform the medical sciences, particularly in dealing with cancer therapies and predicting and preventing metabolic disorders. Automation is already taking away jobs. Probably

more jobs in the US are lost because of automation than are lost by outsourcing. Big data, augmented reality and Internet of Things are beginning to change everything ranging from operation of domestic appliances, commerce and marketing and entertainment to national security, surveillance, intelligence gathering, targeted service delivery and public policy. There are going to be many economic, institutional, political and ethical dilemmas in dealing with these massive changes.

But let me focus on four technologies that are already changing or on the verge of changing, the world as we know in a fundamental way economically and ecologically. First, let us take renewable sources of energy. Solar power, wind power and biofuels have for long been understood, but not mastered. But in the last few years technologies have matured to a level where costs have plummeted, and suddenly esoteric green technologies have become economical with the potential to reduce or even eliminate dependence on fossil fuels and reduce atmospheric pollution. But there is a cost of transition, especially in respect of solar and wind power. As the Economist (Feb 25th March 3rd 2017) pointed out, “If renewables worked constantly that would not, at first blush, look like a problem for anyone except people generating expensive electricity. But renewables are intermittent, which means that in systems where the infrastructure was designed before intermittency became an issue – almost all of them, in practice – fossil-fuel, hydroelectric and nuclear plants are needed more or less as much as ever at times when the sun doesn’t shine and the winds don’t blow. And if such plants are shut out of the market by low-cost renewables, they will not be available when needed”.

We need massive technological breakthroughs in storage of electricity, new management techniques like pumping water upstream in hydroelectric projects to generate hydropower during night time, and massive investments of the order of \$20 trillion over ten years to phase out fossil fuel plants and build smart grids to deal with fluctuations in supply. On top of it the whole fossil fuel distribution system needs to be replaced by a network of outlets for rapid recharging of batteries and replacement of batteries; in addition to development of viable electrical cars with easily replaceable batteries. All these need more research and development, innovation, investment,

management systems and new skills for employment. This sector alone has the potential to transform life as we have experienced in the last century.

Second, let us take aggregators. Uber and other such transport service providers have become household names. Building on digital technologies, these aggregators of personalized transport are already reshaping our world. For about a century automobile sector has been one of the primary engines of growth in developed world. Motor car has become one of the great aspirational symbols of modern age for individuals and families. In 2016 over 88 million cars and light commercial vehicles were sold globally. In 2020, it is estimated that 100 Mn cars will be sold. The total sales revenue of automobile companies is about \$2.2 trillion. The sector employs 9 million workers, 5% of the total workers manufacturing sector world over. Including sales, servicing and support services automobile sector employs 50 million workers worldwide and contributes \$440 Bn revenue to governments. Once aggregators like Uber are able to fully leverage technology and make available personalized transport in all cities quickly, safely and economically, the need for a personal motor car and the aspirational value of its ownership will decline considerably. When we consider that the average use of motor car is only 3-5% of the time, and the car needs very scarce, highly expensive land for parking at home, on the streets, in markets, factories or offices, it makes abundant sense to give up cars. And it will significantly reduce congestion on the roads. All these advantages of aggregators come with tremendous short-term disruption in automobile industry, sales and services in the world's greatest engine of manufacturing and economic growth.

Similarly, take housing/ hospitality aggregators like Airbnb. At the flick of a button any traveller can access accommodation to suit his/her needs in terms of location, cost, amenities and company. Vast, unutilized private dwelling space is instantly available for use, dramatically increasing supply. What is now a challenge to hospitality industry may soon spread to regular housing. In India, it is estimated that there are over 11 million private homes in cities which are unoccupied, while there is a shortage of 18 million dwelling units in these very cities. Once aggregators successfully match this supply with

demand, housing and hospitality sectors will witness a great revolution to benefit owners, tenants and travelers alike. It will give greater fillip to travel and tourism and leisure industry. But there is going to be a serious impact on the traditional hospitality and hotel industry; requiring massive readjustment.

Third, let us take the 3-D printing which is beginning to be commercially viable. So far economies of scale, cheap labour in low-income countries, easy transnational investments and free trade have aggregated manufacturing in a few nations. Nations like US, China, Japan, Korea, Taiwan and Germany have been great innovators and beneficiaries of export-led growth. But once 3D printing becomes commercially viable in automobiles and consumer goods sectors, the world as we know will be altered fundamentally. With 3-D printing and new materials, there will be no economies of scale; decentralized production can be viable; small may be actually beautiful; global supply chains will be redundant; waste will be reduced significantly; and global trade will diminish rapidly. All these have tremendous ecological benefits, but with serious economic convulsions. These changes will herald a new era the implications of which we are only beginning to fathom.

Finally, let us take breath taking advances in material science. New technologies are revolutionizing the world. For instance, phenylmethyl pentene film only 50 microns thick with tiny glass beads embedded and silver painting to reflect heat can now be manufactured at 50 cents per square meter. This film can dramatically reduce temperatures in the households, offices and factories by emitting heat in the form of infrared rays in wavelengths that allow it to be radiated directly into outer space without being captured by the earth's atmosphere. Imagine the implications: significant cooling without air-conditioning and electricity at an incredible low cost; and actual global cooling! This technology alone can make hundreds of millions of lives in poor counties more comfortable, enhance productivity, reduce pollution and power consumption, and even reverse to some extent global warming.

What I have outlined are only a few of the many significant developments in recent years that have the potential to alter the world in a fundamental way. There are many more cutting edge technologies that are transforming our world. The challenge is as much institutional as technological. Building the requisite economic, logistic, production, political, legal and social infrastructure, institutions and practices is a matter of the highest priority.

India has not benefitted significantly from the first and second industrial revolutions, and has to some extent leveraged the third revolution. The rapid spread of a billion mobile telephones, nearly 200 million smart phones, growth of social media, our embrace of information technology and IT-enabled services and in-roads in internet-marketing and electronic payment – all these are examples of how we could convert late entry into an advantage by leap frogging in technologies and practices. But even then, we could only leverage some of the benefits of new technologies, and could not become major global players in global economy. Computer hardware, chips, smartphones manufacturing – all these have been captured by other nations, notably the US as the powerhouse of technology and innovation, and China as manufacturing giant in the past three decades.

We in India need to be on board this fourth industrial revolution well in time so that we can be among the leaders, innovators and producers, not merely followers and consumers. But for this to happen we need to transform our institutions and embark on modernization of our economy and governance. In December 1978 under Deng Xiao Ping's leadership, china embarked on four modernisations – Agriculture, Industry, Science and Technology, and Defense. China steadfastly focused on its vision and translated it into reality, making it the second largest, soon to be the largest, economy in the world, and the greatest beneficiary in terms of its impact on human lives of the second and third industrial revolutions. Now India must embark on great modernization of six sectors – Agriculture, Education, Science and Technology, Healthcare, Public Services and Politics and Governance. Each of these is eminently doable, economically viable and politically feasible.

Foundation for Democratic Reforms, Loksatta movement and I have been for over twenty years, articulating the need for reforms in each sector, and we have been tirelessly focusing on specific reforms in each of these sectors. We have even been fortunate to see some tangible improvements in these sectors by virtue of the work of FDR and Loksatta. A lot more remains to be done. We have a limited window of opportunity. In the 1980's and 1990's, we missed a great opportunity. Had we quickly seized the global opportunities, we could have emerged as a global giant along with China. But our hesitant, partial, halting steps yielded some results, but nowhere near what we need to end poverty and employ our youth, and well below what we are capable of accomplishing as a nation of great civilization, if we set our house in order. Our rise is delayed, but it is never too late. Let us, as a nation transcend petty divisions of caste, region, religion, ethnicity and faction; let us focus on the long-term, larger public good instead of short-term fixes and freebies; let us leverage our strengths and give every child an opportunity to fulfill her true potential irrespective of the accident of the womb, let us build an affordable system to eliminate all avoidable sickness, disease and the suffering without any out-of-pocket expenditure for the poor and the deprived; let us modernise agriculture and integrate it with markets, value addition, and industry; let us rejuvenate our science and technology institutions and become a major innovation; and above all let us transform our public services and political institutions to give us best value for the taxes we pay, to reconcile conflicting interests in our complex society harmoniously, to allow the finest public-spirited citizens to rise to the top in every sphere, to get wise, far-sighted, pragmatic direction to our society and nation, and to transform lives of our long-suffering people. If we act now with will and wisdom, we can emerge as a global economic giant in keeping with our great civilization, and be a major force of stability and harmony in a turbulent world. We have the potential, and a priceless opportunity. This is India's moment.

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