

Role of Corporates in Bringing Social Transformation¹

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Respected Shri Chandrasekaran ji, respected Shri [Padmanabhan](#) ji, respected Dr. Mashelkar and distinguished ladies and gentlemen. A very good morning to all of you. I am delighted and honored to be invited to this prestigious event [TAAP annual convention](#) hosted by Tata Group.

I am especially grateful to Mr. N. K. Sharan for inviting me. Doubly so since it allowed me to meet Tata Chairman [Mr. Chandrasekaran](#). We both got the Padma award on the same day in Delhi, and I wanted to meet him, but he was the most sought-after celebrity, and everybody wanted to take a selfie with him. Since I missed out hence thank you Mr. Sharan for giving me this opportunity!

Mr. Sharan was also very considerate in informing me about the details of TAAP program by sending his colleagues Mr. Shreyas Desai and Ms. Archana Lawande to Phaltan. I have now a deep appreciation of the work done by Tata Group in Corporate Social Responsibility (CSR) and other fields.

Tatas have always been pioneers in CSR and [Shri. Jamschetji Tata](#) was the shining example of what CSR is all about. When nobody knew about CSR, Tatas practised it. I also feel that when Gandhiji introduced his concept of trusteeship for corporates he had the example of Shri. Jamschetji Tata in his mind. Mr. [J. R. D. Tata](#), Mr. Ratan Tata and Mr. Chandrasekaran have fine-tuned it and today Tata's CSR efforts have the stamp of their philosophy.

¹ Keynote address at TAAP Annual Convention. Mumbai, 8 June 2022.

So, when Mr. Sharan invited me to give this talk it was like carrying coals to Newcastle. I therefore feel very humbled to give this talk and to share our limited experience with you and to explore how all of us – corporates like you and Science and Technology (S&T) NGOs like ours can work together to bring in social transformation via economic prosperity. This prosperity can be possible if goods and services at affordable prices are made available by corporates in rural areas. I also believe this can be helped by doing excellent R&D specifically for rural problems. I will explore this further in my talk.

But before that I would also like to share with you an interesting incident. I very nearly joined the Tata Group in 1981. In 1979, when I was a student in USA, I had written a long letter to Shri. Darbari Seth outlining my vision of Solar energy work in India. Based on this letter Shri. Darbari Seth had invited me to meet him whenever I came to India. So in December 1980 I met him in Bombay House. Darbari ji told me that my letter reminded him of a similar letter that [Homi Bhabha](#) had written to JRD Tata. At that time not knowing the context, I did not understand its significance. During the meeting he offered me a very big position in Tata. In my arrogance I refused it. I have written about this episode in my autobiographical book [“1970s America – an Indian student’s journey”](#).

It is the same arrogance which made me leave a very lucrative career in U.S. in early 1980s and come to rural India. I thought with my knowledge and experience in solar energy I will change India. India is a very ancient country and society and how foolish I was to think about changing it. India did not change – it changed me. Living and working in rural India taught me humility, sustainability, and spirituality. In the process I also learnt an interesting lesson. If you want to do something different you have to be foolish and arrogant as I was!

Thus, to lot of my peers I have been a failure because with so much of education and opportunity I left a lucrative career in U.S. to work in rural India and hardly made any money. But I feel that I have lived a fruitful and

emotionally satisfying life that is far more precious than making a lot of money. In the process I have also discovered that an [altruistic mindset is necessary in developing good solutions for rural poor](#).

I and my wife Dr. Nandini Nimbkar run a small rural NGO called Nimbkar Agricultural Research Institute (NARI) in Phaltan, Maharashtra where we do R&D in areas of agriculture, renewable energy, animal husbandry and sustainable development. All our work is written up on the website of NARI; www.nariphaltan.org In 2018 we celebrated the [Golden Jubilee of our Institute](#).

I would now like to share with you some observations and lessons that we learned while developing innovative technological solutions for rural areas on a shoestring budget.

Lesson 1

One of the biggest lessons we learned is that ***we need excellent and dedicated people on the ground for rural development***. I can share our own example where we [pioneered so many technologies](#) which were first in the country and maybe in the world because we applied the best tools of S&T to the local problems. Also the technologies were not developed in a short time but required dedication and continuous working and fine tuning them.

Why they did not become best sellers is a different issue altogether and I will talk about it later.

I therefore feel that some of our brightest and most talented scientists and engineers are needed to solve the complex technological problems of rural India using local resources, materials, and workforce. Somehow our brightest students do not engage with rural problems and so it is really a great challenge for all of us to make them interested in them.

In fact, very few of our bright students opt to study agriculture. When all other avenues like engineering, medicine, etc. are closed then the students choose agricultural subjects. How to [make agriculture glamorous and a vocation worth pursuing](#) will really exercise our minds. Because it is the agriculture which provides us the most important thing for our survival and that is food!

Also, by just staying for a month in a rural area or casually visiting it will not solve those problems. When one stays and works in these areas for a longer time then one understands the problems better and I feel that smart people can think about them and can produce out-of-the-box solutions to solve them. A stay for a year or two with S&T NGOs will do a lot of good to these people.

To do this, I would like to propose a solution. ***Is it possible to create and nurture Tata fellows for working on rural technologies, specially related to agriculture?*** Each Tata fellow (who will be a Tata employee) can be given a handsome fellowship to work in development of technologies and be attached with rural S&T NGOs. Creation of such a fellowship could be a part of CSR activity.

Not only will it help the fellows to become aware of problems in rural areas but may help them to initiate projects in Tata companies so that some new business avenues develop. So, there is a need to create these fellows as technology managers for rural projects. Besides, it might also change their perspective on life when they see and feel the rural poverty.

For providing technological solutions for rural population we need to look for excellent technologies which are presently available and put them together. This is how majority of solutions are provided world over and rural India is no different.

Tata companies are involved in every aspect of business and thus these fellows can work in any field affecting rural populations. Smart people enjoy challenges. They thrive on them. For some it gives a high and then they forget about the pinpricks associated with their working environment. I feel once the rural junoon gets into the DNA of these corporate fellows then we may see a new corporate culture develop which will look at a more inclusive growth and development. ***It will be like starting a grassroot S&T development program in different Tata companies!***

To my mind the creation of technological solutions through R&D which will lead to wealth generation for rural areas should be the best use of CSR funds. Wealth generation in turn can bring in social transformation.

Lesson 2

The second lesson that we learned is the ***need to develop unique technological solutions for rural problems.*** We have unique rural problems which nobody will solve except us. So we need our own solutions. Presently most of our products are made for urban areas and then they trickle down and get transported to rural areas.

We need to make the goods and solutions in or near the rural markets rather than shipping them through thousands of kilometers at enormous cost. This will require very innovative use of local decentralized energy sources like solar, wind and biomass together with locally available materials to produce the final products. In this process very innovative technological solutions like 3D printing, artificial intelligence, etc. could be used.

It is the corporate world which provides goods and services to people both in rural and urban areas. So the technological and innovative solutions have to come from them. Government of India sometimes can help and facilitate this process.

One of the biggest challenges in rural India is to improve the farming systems so that the income of farmers is increased manifold. Most of our farming is still done in a primitive manner.

I feel technologies exist which can increase the earnings of farmers. What is needed is the identification of these technologies, their suitable modification and matching them for end usage and products. This could be the challenge for the Tata fellows.

For example, fruits and vegetables give farmers good income. However, transporting them to the selling centers means transporting 90-95% water. Food preservation and processing locally in small batches may reduce the water content, add value to their produce and increase their income.

Thus, putting the vegetables and fruits in small cold rooms and developing adequate cold chain can extend their produce life. Similarly initial on-farm heat processing for reducing water content of fruits and vegetables will give additional remuneration to the farmers and reduce the transport cost. One example is NARI's work of production of [table variety syrup from sweet sorghum juice](#). I will talk about this later on.

Another high-tech way to farm is by hydroponics or soil-less agriculture. I believe Tata Chemicals are doing excellent work in this field. There are interesting technologies in [hydroponics](#) which can be utilized on small scale and can give added income to the farmers. Hydroponic systems provide excellent growth of leafy vegetables, fodder, and high value plant products like herbs. They are being promoted as urban agriculture but can provide extra income to the farmers.

Presently these systems are costly, driven by large companies and their scale is also huge. Low cost and innovative systems need to be developed for small farmers. We are doing a small experiment where we would like

to lease these units to the farmers to grow and sell the produce. This will help reduce their capital costs and headache of maintaining and upgrading the system.

The wealth of the country comes from its land and the most important commodity is food. After all we need to eat food rather than nuts and bolts or software and by helping the farmers the Tata fellows can really help the rural areas.

We cannot simply import farming technological systems from abroad because the farms in U.S. and Europe are huge and hence those systems are not suitable for small holdings (<1ha) of Indian farmers. Scaling down these technologies may help and will tax the best brains. But I think a better solution is developing unique technologies for small farms. This will be a right step in creating *Atmanirbhar Bharat* which the Prime Minister is stressing upon. Small and efficient farm machines for plowing, seeding, pesticide application, harvesting, weed removal are needed. **[They may work on AI technologies and could also be electric-powered.](#)**

The resources and materials available in rural areas are in dilute form and they need to be converted into useful end devices. Corporate fellows can use out-of-box thinking to produce viable solutions. Such solutions are also called **[frugal innovations](#)**.

Nevertheless, frugal solutions require excellent S&T inputs, and to my mind they alone can provide long term solutions at affordable prices. This is quite different than *jugaad* which is a short-term tinkering-type solution. Naturally, frugal solutions will themselves evolve and become mature. In using local resources and materials the Tata companies will also enhance their focus and sharpness in the technological areas.

Frugal Innovations at NARI

I will now briefly talk about some of the frugal innovations developed in our Institute.

- (1) A strange fact of farming systems is that only [25-40% of a plant produces food for us](#). The rest are residues which are mostly burned by farmers. They do this as a part of waste disposal since there is no market for these residues. This produces pollution and is a waste of precious energy and fertilizer resource. So in early 1990s we pioneered the development of [biomass gasifiers running on agricultural residues](#) like sugarcane leaves and other leafy materials.
- (2) Similarly, we developed the concept of biomass-based [power plants for Taluka](#) in 1994 so that the residues available in each taluka or tehsil could be used for producing power. NARI was the principal author of the national policy on Taluka power. Till today ~2500 MW capacity power plants have been installed in India by IREDA and biomass mapping of all the talukas in the country has been done.
- (3) Alternatively, we need to develop technologies so that all parts of a plant are used for human consumption. This requires converting these residues into useful products like biofuel, bio-fertilizer, and fodder. The selling of residues for useful purposes will also increase the income of farmers. Fortunately, large number of farmers have started incorporating these residues into soil for its improvement. We nevertheless need excellent machines to enhance this incorporation.
- (4) In our Institute we have followed the whole plant approach in all our crop research. For example, we developed the use of [sweet sorghum for food, fuel, and fodder](#) so that every part of the plant is used. This has also helped solve partially the food vs fuel land use debate. Thus we developed technologies for producing ethanol and syrup from sweet sorghum juice.

- (5) We also pioneered the use of [low-grade ethanol as a fuel for cooking and lighting in rural households](#). Because of stringent Indian excise laws, it did not take place in Indian rural areas. However, this idea was picked up and large-scale adoption of this concept has taken place in African and Latin American countries.
- (6) While working with the poorest hutment dwellers in Phaltan area we developed the [rural restaurant concept](#). This concept was developed by us in 2012 and we feel that [Amma Unavagam](#) in Tamil Nadu and Shiv Bhojan in Maharashtra evolved from our study. Almost one crore low-cost thalis per year are served under these schemes.
- (7) I was born and raised in Lucknow, and I used to be very disturbed by the plight of rickshaw pullers. So when the opportunity came, we worked on [developing electric rickshaws](#) in mid 1990s. Today lakhs of e-rickshaws are on the Indian roads.
- (8) A very innovative program in animal husbandry was carried out by [twinning of sheep through FeCB gene introduction](#) and artificial insemination techniques. Large scale dissemination of this technology has been done by state governments in Karnataka, Tamil Nadu, and Andhra Pradesh.
- (9) But the real frugal innovation has been in doing R&D on a shoestring budget. Thus, all the R&D in renewable energy in the last 40 years at NARI has been done in less than Rs. 4 crores. I feel that to do excellent R&D one does not need a lot of money. What is needed is deep thinking and passion for problem solving. This results in some very innovative solutions.

I have written about them in my book [“Romance of Innovation – A human interest story of doing R&D in rural setting”](#). I believe all of you have been given a copy of this book.

Besides this all our books, articles, talks, podcasts are available on the internet since I believe that knowledge should be freely available. ***There is a law of knowledge; the more we spread it the more we get it.***

I also feel that for facilitating technological solutions in rural areas it might be beneficial if there is a partnership between Corporates, S&T NGOs, and R&D institutes, with S&T NGOs acting act as technology managers.

Lesson 3

Marketing of technological solutions through startups. I believe that startups could provide an excellent bridge between prototype development and production scale-up and sales. Tata fellows may help in launching startups in different Tata companies after their internship in rural areas.

This could be facilitated by the provision of venture capital funds in these Tata companies so that a small grassroot science, innovation, and incubation program is developed in them. This program may also help in changing the culture of Tata companies to become even more inclusive. There are very few venture funds for agri-tech startups in the country. If Tata companies create such funds, then it may start a nationwide trend.

We started our [R&D activities in renewable energy in early 1980s](#) and developed very innovative technologies. These pioneering efforts had no takers at that time, and we feel that we were almost 10-15 years ahead of time. We did interact with quite a few big companies in early 1990s to commercialize our inventions but found that their bureaucracy was not interested in taking up these high-risk projects.

I feel if we had a startup culture at that time or the corporates had the critical mass of the “Tata fellow types” then it might have been easy for them to look at some of these technologies more favorably. That was the reason why some of our unique solutions did not get into the marketplace.

Lesson 4

I now come to the last and the most important lesson. **We need to reduce our greed and become sustainable in our personal life.** As Gandhiji said be the change you want to see. So each one of us needs to be sustainable if we want others to be so.

If corporates produce technologies and solutions to improve the quality of life of rural population then they need to reduce the profit margins for rural goods and services. **That is the real CSR.** Profits are necessary but they should be tempered by the desire to do good and give back to the society. With lesser profits the corporate world can touch the lives of huge number of people at the bottom of pyramid and help them get into the mainstream development process. That will be true nation building.

Greed can be reduced by practicing spirituality. Spirituality is concerned with the matters of spirit. When we think deeply and for a long time about anything whether it is an idea or an object then the brain has a tendency of focusing on it like a laser and in that process the object vanishes from the vision field and only its germ or the spirit remains. Then complete knowledge of that idea or object results. This is what Patanjali has written in his Yoga Sutras.

This is the mechanism by which all [great discoveries of the world](#) have been made. Whether it was Einstein, Newton, Mozart, Beethoven, Christ, or Buddha – all of them thought very deeply about their subjects. It is this deep thinking on anything which makes our brain very powerful; makes us spiritual, removes our insecurities and gives us a sense of peace and happiness. It also gives us a proper perspective on what is important in life.

Each one of us is capable of deep thought. Somehow, we are not motivated or touched by strong feelings to undertake this exercise. So, it is my hope that when the Tata fellows get immersed in the rural experience it will

help them to be motivated to think deeply about the rural problems. A powerful experience also propels people to question all the parameters and assumptions of life and that is the first step towards becoming spiritual.

Spirituality is not religion. It is the state of mind that makes it aware that the Truth is beyond the barriers of worldliness, religion, caste, creed, race, or geographical boundaries. It connects us to marvels of nature in a deep way and subsequently to Universal Consciousness or the mind of God.

It is also my belief that when basic needs are taken care of so that there are less worries about them, we are capable of producing a very high quality of thought. This helps in producing wonderful solutions on whatever subject we choose.

I have experienced this period of high during my [graduate studies in U.S.](#) where being free of worry about board and lodging the only focus was getting knowledge. That was one of the happiest periods of my life.

So, this is my dream for the future Tata fellows. With their basic needs for rural stay taken care of they will produce wonderful solutions. It is not that every one of them will succeed but even if 10% of these fellows produce great results then it would start a revolution in corporate thinking and culture. After all quantity begets quality.

One important consequence of becoming spiritual is that one becomes internally secure, fearless and the desire to impress others is reduced. It also reduces our desire to control the events and the narrative, and this can lead to a more tolerant and happy society.

Consequently spirituality helps us live a sustainable lifestyle since one uses goods and services to fulfill ones needs and not to show off! This can

help us reduce our energy and resource consumption and by judicious and efficient use of technology we can live a sustainable and emotionally satisfying life.

I have been practicing this in my own life for the last 40 years where [we live comfortably with about one fourth the energy consumption of an average American citizen](#). If all of us live in a sustainable way then this earth is sufficient to provide for all our needs.

I therefore believe that the mantra of India's and world's development should be [“Technology guided by Spirituality can produce Happiness and Sustainability”](#). Spirituality allows us to curb our greed and with technology it can make our lives better.

I have been writing on this [issue for the last 20 years](#) and have published more than 200 articles in Times of India (Speaking Tree), [Thrive Global](#), Huffington Post and [South Asia Monitor](#). I feel that if we use the ancient Indian philosophical thought with the modern technology then this could lead to a new paradigm of development for creating a sustainable and emotionally satisfying world.

I will end this talk by telling you a story, a tale from our ancient scripture the *Puranas*. It is a typical Indian story of a sage and his disciples.

The sage asks his disciples, “When does the night end?” And the disciples say, “At dawn, of course.” The sage says, “I know that. But when does the night end and the dawn begin?”

The first disciple, who is from the tropical south of India replies: “When the first glimmer of light across the sky reveals the fronds of the coconut trees swaying in the breeze, that is when the night ends and the dawn begins”. The sage says “no”.

So, the second disciple, who is from the cold north, ventures: “When the first streaks of sunshine make the snow gleam white on the mountaintops of the Himalayas, that is when the night ends and the dawn begins”.

The sage says, “No, my sons, when two travelers from opposite ends of our land meet and embrace each other as brothers, and when they realize they sleep under the same sky, see the same stars, and dream the same dreams - that is when the night ends and the dawn begins”.

I feel that when we scientists, technologists and corporates will help light up the lives of rural population through technology and resources, then it will bring in the dawn of a new and prosperous India.

Thank you.

[HOME](#)



A nice photo with Tata Chairman Mr. Chandrasekaran



Sharing the table with Mr. Chandrasekaran and Mr. S. Padmanabhan
(chairman, Tata Business Excellence Group)



Delivering the keynote address



L-R; Mr. Mr. S. Padmanabhan, Mr. NK Sharan (vice president), AKR, Nandini, Shreyas Desai



After giving the awards at the valedictory session.



Exchanging visiting cards with Mr. Chandrasekaran. Dr. R. A. Mashelkar (R) and Dr. Narendra Jadhav are also in the frame.

[Slides presentation](#)

[Video of talk](#)

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TAAP agenda given below

TAAP CONVENTION – 8TH JUNE 2022

AGENDA

Crystal Room and Ballroom, Taj Mahal Palace, Mumbai

Time (IST)	Duration (minutes)	Program Details
10.00 - 10.05	5	Safety Film + Welcome by MC
10.05 - 10.15	10	Context Setting by S. Padmanabhan
10.15 -10.30	15	Address by Dr R. A. Mashelkar, <i>TAAP Governing Council Chairman</i>
10.30 – 11.10	40	Address by Keynote Speaker Dr. Anil Rajvanshi, Director of the Nimbkar Agricultural Research Institute (NARI).
11.10 - 11.30	20	TAAP Recognitions by Chairman, Tata Sons Pvt. Ltd. a) Jury Awards -3– two-minute speech by each of the Award winners CEO b) Significant Adoption -2 c) TAAP adoption award (First timers) -2
11.30-11.50	20	Address by Mr. N Chandrasekaran, Chairman, Tata Sons Private Limited
11:50- 12:15	25	TEA BREAK
12:15-12:20	5	TAAP potential ‘E’ awards – 7 companies
12:20 – 12.35	15	TAAP – The Journey of a Tata Company (CEO Speak – TSDPL)
12:35-12: 47	12	TAAP Awards and Recognitions (12 Assessment teams recognitions)
12:47 – 1:02	15	TAAP facilitation – Experience sharing (Croma)
1:02 – 1:18	16	TAAP Awards and Recognitions (4 Assessment teams recognitions) TAAP Best Practices Recognition (Best Practice -12)
01.18- 1.20	2	Vote of Thanks
1:20 - 2:30	70	LUNCH BREAK
2.30 – 4.30	120	TAAP Shining Stories - 3 stories to be presented by the companies participating in the exhibition (Each story around 20-25 mins followed by Q&A) 1. Women empowerment and inclusion through digital interventions (Tata Power) 2. Tribal Leadership Program (Tata Steel) 3. Entrepreneurship – A Panel Discussion (ISWP/Tata Steel/ TPDDL)

- **Invitees:** 170+ invitees, Senior Tata Executives, TAAP Governing Council, Company CEO’s, CHROs, SCM heads, CSR heads AA Champions, Award winning company representatives.