

Sustainable Development – the Gandhian Way ¹

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Gandhiji not only gave India its freedom but also gave the world and us a new thought on nonviolence and sustainable living. His teachings and experiments are more valid today than ever before, especially when we are trying to find solutions to worldwide greed, violence and runaway consumptive lifestyle which are putting a very heavy burden on the world's resources.

Through ages India has time and again given to the world a new thought. Thus Buddhism, Jainism, Yogic system, Sikhism are part of the great spiritual thought given by India from time to time. Gandhiji's message of nonviolence and sustainable living is a continuation of that long tradition.

To my mind Gandhiji's greatest contribution to sustainable development was two fold. Firstly his experiments in simple living and high thinking. He believed that with simple living the resources of the planet earth can sustain us comfortably and his famous saying that earth provides us enough for our needs but not for our greed is extremely apt today. Secondly his insistence on all inclusive growth of the society and hence his focus on rural development.

I will try to show in this essay how both these issues are as relevant today as they were 100 years ago when Gandhiji enumerated them.

Gandhi's spirituality

Gandhiji was a highly evolved and spiritual human being. To him spirituality came first. Other things like politics, public life etc. were by-products of his spirituality. Also as a person progresses on the [path of spirituality](#), his or her priorities in life change. The focus of life shifts more towards getting personal happiness through mental peace or by helping others and less on material needs, greed and desires. Gandhiji's experiments on simple and sustainable living followed his own spiritual progress.

He also realized from an early age the importance of a great body and mind. In this he was following the tenets of ancient Yogic system which stresses on a healthy body and a powerful mind. Thus all his experiments on food, brahmacharya (celibacy) and fasting came from this belief. Besides he also

¹ Published in a book entitled ["Timeless Inspirator – Reliving Gandhi"](#)

realized that to fight a powerful enemy like Britain, he had to make his body-temple extremely powerful so that it could sustain long fights. This meant that it had to need least amount of comforts and external inputs and thus Gandhiji showed that with simple living he could produce the highest quality of thought. To my mind this was an ultimate example of sustainable living.

The spirit of Bhagwad Gita's Karma Yoga guided him in his endeavors and he considered it as his duty to help his countrymen and fellow beings. There are many instances of people who saw his glowing skin, aura, and felt the [presence of his personality](#) whenever they met him. That is only possible for a Yogi of very high order.

My father who was involved in the freedom struggle and went to jail with Gandhiji told of a remarkable instance. In early 1940's just before the quit India movement, a mammoth public meeting took place in Allahabad. Between half to a million people were present. Gandhiji was late for the meeting. All the great leaders of independence movement were giving their speeches and trying to calm the crowd, which was quite restless. Then suddenly Gandhiji came, climbed on the dais and put a finger on his lips. A wave of silence swept the grounds starting from dais. My father termed it as a remarkable experience of the power of a small frail man over the masses.

Possessed with a great body and a powerful mind he also became fearless and it is this quality of fearlessness which made him blaze new trails and produce novel political strategies like nonviolence, Satyagraha, etc. Time and again he showed his fearlessness by dealing with British on equal terms. In 1920s and 30s during the height of colonial rule such a behavior of a subject in front of his colonial masters was unique and provided a quantum jump in raising the consciousness of Indians.

When the brain becomes very powerful it also becomes sensitive to the surroundings. This is the genesis of nonviolence as this makes all life sacred.

Gandhiji as the pujari (priest) of nonviolence used it for everything including industrialization. He rightly thought the industrialization of 1920s to be a violent system with heavy machinery, very inefficient energy and materials conversion technologies and no concern for the environment. Intuitively he revolted against those systems and felt that simple life (with few needs) and most of the daily things to be produced from locally available materials was nonviolent and in tune with the nature.

Gandhi was not anti-technology or science. He was a prisoner of his times. He always said that he was a pujari (priest) of "body-temple" and since it was the most complex machinery in the world so how could he be anti-machinery! He believed in rural-based and economically viable local production and

consumption systems. Hence he was against things made in Bombay and shipped to rural areas. Similarly he said that he objected to electricity being produced in Bombay and transmitted to Wardha (where his ashram was). He wanted it produced in Wardha from local resources – again showing his vision since decentralized power production is gaining currency.

Not being a student of science or engineering he could not express his feelings in a scientific way but always talked about his dream village which he felt will be self-sufficient with its inhabitants living in harmony with nature. Modern technology which is following bio- mimicry allows for the first time to have softer and efficient systems to achieve our purposes and for the Gandhian dream becoming a reality.

I am sure if he were alive today he would have felt that his dream village could have taken shape with the availability of internet connectivity, desktop manufacturing and small renewable energy power packs. His dream of giving employment and decent life to rural population may become possible with the availability of these energy-efficient and high-tech systems.

As a spiritual being and a visionary Gandhiji was far ahead of his times. For example he was energy conservator par excellence. He lived in his ashrams without electricity or any modern amenities. His insistence on use of self/human labour for majority of needs was legendary and was usually frowned upon by his closest colleagues who thought it was anti-progress and pushing back India to stone ages. Nevertheless with the development of sophisticated man-machine interface technologies like free play radios, human powered electricity producing units for laptops, cell phones etc, the use of self/human labour maybe able to solve the twin problems of obesity and energy!

Gandhiji believed in all - inclusive growth and felt that India can only become a great nation when its teeming and impoverished rural masses become better off. He therefore focused on rural development for last 30 years of his life and felt intuitively that future of India is in decentralized rural development. This vision which he stated in 1920's is even more valid today after almost 100 years.

For example it is a sad state of affairs that even 63 years after independence around 60% of our rural population lives in primitive conditions. They have hardly any electricity; they cook on primitive chulhas which create tremendous indoor air pollution and have not changed in thousands of years; and have no clean drinking water. Their lives are in darkness and somehow the modern technology has not touched them. There are estimates that nearly 1 million deaths take place every year in India because of indoor air pollution and unclean drinking water. Unless and until scientists, technologists and decision-makers improve their quality of life India will not join the ranks of developed nations.

In order for this to happen, creation of wealth and employment should take place in rural areas. I believe this is possible when [agriculture provides both energy and food security](#) for India in an economically viable manner. It is the land that provides the wealth of the country - a message that Gandhiji always gave regarding rural development.

I will now show how this wealth can be created in rural areas thereby creating all round sustainable development.

Energy from agriculture

India produces close to 600-800 million tons/year of agricultural residues. Most of these residues are burnt in fields to solve the waste disposal problem. Not only does this create tremendous air pollution but this burning is a waste of an important energy resource.

These agricultural residues can theoretically produce via lignocellulosic conversion about 150 billion liter/year of ethanol which can take care of about 50% of India's total oil demand. Similarly if we go via the pyrolysis oil route then it can provide around 80% of India's diesel demand. Pyrolysis oil is produced by rapid heating of biomass to 600-700⁰C and quenching the smoke rapidly to produce oil. This oil with suitable modifications is very close to diesel in characteristics.

Alternatively if these residues are burnt in the biomass-based power plants then they can produce close to 80,000 MW of electricity or nearly 50% of India's total installed capacity. Biomass power plant technology is very well developed all over the world and there are close to 91 plants in India with installed capacity of about 500 MW.

Presently these residues, which constitute 60-75% of total biomass produced, do not fetch any money for the farmers. Since these residues can produce very high-quality energy like electricity and chemicals they should be properly priced. With such pricing the farmer can easily get an extra income of Rs. 5000-7000/acre per season. This extra income can make farming remunerative and change the face of rural India. Besides easing India's present energy crisis it can be a Rs. 200,000 crore/year (Rs. 2 trillion/yr) industry. At the same time the use of biomass for energy production can also produce about 50 million jobs in rural areas. Thus farming for energy will lead to a very prosperous India.

In coming years quite a lot of these residues may also be diverted to produce organic fertilizer in rural based high-tech units. Which stream the residues will go will be dictated by local market forces.

I strongly feel that when the farmers are neglected the long term sustainability of the country is threatened. When farms produce both food and fuel then their utility becomes manifold. In India 65% of its population depends on farming and with energy from agriculture as a major focus, India has the potential of becoming a high-tech farming community. This will help improve the rural environment and create better India, something that Gandhiji always stressed.

I also believe that this can be done by the use of high technology for rural applications. High technology allows the conversion of abundant locally available “dilute” energy resources like biomass, solar, wind etc. into useful end-products and services. Together with modern methods of production and distribution they can also be very economically feasible. In this process we need to follow nature and so the mantra of technology development should be biomimicry.

Natural systems through millions of years have evolved into very efficient materials and energy converters. In this process, [size of the system reduces and its efficiency](#) and complexity increases. Some of our designs and technologies are following this strategy. For example, computer chips, cell phones, power plants, etc. are all becoming very efficient, small in size, complex and economically viable. Technology developers should follow this strategy in developing rural technologies.

Lessons for future

Every citizen of this earth aspires to a decent lifestyle. I believe such a lifestyle is possible with much less energy than is consumed by an average US citizen. For example, in the US the per capita energy consumption is 350 GJ/yr, whereas in India it is a low of 18 GJ/yr. If every citizen of India has the consumptive lifestyle of Americans then all the resources of earth will only be sufficient for India alone.

I feel energy consumption of 50-70 GJ/person/yr or one-fifth that of the US can provide a [decent and emotionally satisfying lifestyle](#). This energy consumption will give the lifestyle that Europeans had in 1970s. This type of energy consumption will put much less pressure on the earth's resources besides reducing substantially the environmental pollution. However, it can only happen if each one of us become spiritual and follow the Gandhian maxim of ‘simple living and high thinking’.

Once our basic needs are satisfied, all of us long for some meaningful existence. Even the very rich are looking for some meaningful actions and purpose in their life. Happiness cannot be obtained by money alone. It only comes when there is some meaning to life. That meaning, I feel comes from helping other less fortunate people and by giving back something to the society. As engineers and scientists we can do it by providing right-sized technologies at the right ‘price’ to the poor. It is a

doable goal. What is needed is the direction and will of political leadership to make the life of poor people better.

I also believe that the whole purpose of our existence is to increase personal and societal infrastructure. Personal infrastructure includes our health, happiness and general well-being. By improving our personal 'infrastructure' through spirituality, we become better human beings and it helps in our emotional growth and evolution. By giving back to the society so that its 'infrastructure' increases we help in mankind's evolution. Both these activities when carried out simultaneously, can give us great joy and satisfaction – a message that Gandhiji gave through his actual work and experiments.

Thus the mantra of development should be spirituality with high technology. Both these things allow us to reduce our greed for resources and live in harmony with nature - something that Gandhiji preached intuitively all his life.

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