Mahatma Gandhi's Perspectives on Technology for Development

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Abstract: Gandhi's concept of education included manual work as a means to make education inclusive. This paper deals with Mahatma Gandhi's Vision on Education, his thoughts on science and technology, apart from use of scientific method of exploration of truth and wisdom. It also clearly explains how appropriate technology / low cost technology can be used for creation of employment and use of indigenous methods for safe guarding the quality of life and protecting environment. His aim was to create an independent India made up of autonomous village communities to survive. Gandhi's ideas, which emerged out of an 'Indic' meta-cultural background, are based on an emphasis on equity. Gandhi valued self-sufficiency and autonomy by using appropriate technology for development by not devastating the local manpower resources, thereby, achieving Gram Swaraj.

Keywords: Education through Crafts, Appropriate Technology, Satyagrahi Scientist, Gram Swaraj.

I. MAHATHMA GANDHI'S VISION ON EDUCATION

Gandhi's values and his vision of what constituted a truly civilized and free India, it was not surprising that he developed firm views on education. Education not only moulds the new generation, but reflects a society's fundamental assumptions about itself and the individuals which compose it. Gandhi's concept of basic education included manual work as a means to make education inclusive. He strongly believed in holistic curriculum, even in primary education that introduces children to work-experience through agriculture, weaving, carpentry and several other skills.

He was, in fact, absolutely opposed to modern machinery and emphasized the need for a machine-less society. Gandhi developed his unique ideas on education. The core of his proposal was the introduction of productive handicrafts in the school curriculum. The idea was not simply to introduce handicrafts as a compulsory school subject, but to make the learning of a craft the centerpiece of the entire teaching programme. It implied a radical restructuring of the sociology of school knowledge in India, where productive handicrafts had been associated with the lowest groups in the hierarchy of the caste system. Knowledge of the production processes involved in crafts such as spinning, had been the monopoly of specific caste groups in the lowest stratum of the traditional social hierarchy. Many of them belonged to the category of 'untouchables'. India's own tradition of education as well as the colonial education system had emphasized skills such as - literacy and acquisition of knowledge of which the upper castes had a monopoly. The social philosophy and the curriculum of what he called 'basic education' thus favoured the child belonging to the lowest stratum of society, in such a way it implied a programme of social transformation. It sought to alter the symbolic meaning of 'education' and to change the established structure of opportunities for education.

Gandhi proposed the introduction of productive handicrafts into the school system was not really as outrageous as may appear. What he really wanted was for the schools to be self-supporting, as far as possible. There were two reasons for this. Firstly, a poor society such as India simply could not afford to provide education for all children unless the schools could generate resources from within. Secondly, the more financially independent the schools were, the more politically independent they could be. What Gandhi wanted to avoid was dependence on the state which he felt would mean interference from the centre. Above all else, Gandhi valued self-sufficiency and autonomy. These were vital for his vision of an independent India made up of autonomous village communities to survive. It was the combination of swaraj and swadeshi related to the education system. A state system of education within an independent India would have been a complete contradiction as far as Gandhi was concerned.

He was also of the opinion that manual work should not be seen as something inferior to mental work. He felt that the work of the craftsman or labourer should be the ideal model for the 'good life'. Schools which were based around productive work where that work was for the benefit of all were, therefore, carrying out education of the whole person-mind, body and spirit. The right to autonomy that Gandhi's educational plan assigns to the teacher in the context of the school's daily curriculum inconsistent with the libertarian principles that he shared with Tolstoy. Gandhi wanted to free the Indian teacher from interference from outside, particularly government or state bureaucracy. Under colonial rule, the teacher had a prescribed job to do that was based on what the authorities wanted the children to learn. Textbooks were

mandatory so that Gandhi found that 'the living word of the teacher has very little value. A teacher who teaches from textbooks does not impart originality to his pupils'. Gandhi's plan, on the other hand, implied the end of the teacher's subservience to the prescribed textbook and the curriculum. It presented a concept of learning that simply could not be fully implemented with the help of textbooks. Of equal, if not more importance, was the freedom it gave the teacher in matters of curriculum. It denied the state the power to decide what teachers taught and what they did in the classroom. It gave autonomy to the teacher but it was, above all, a libertarian approach to schooling that transferred power from the state to the village. Gandhi's basic education was, therefore, an embodiment of his perception of an ideal society consisting of small, self-reliant communities with his ideal citizen being an industrious, self-respecting and generous individual living in a small cooperative community. For informal educators, one can draw out a number of useful pointers. First, Gandhi's insistence on autonomy and self-regulation is reflected in the ethos of informal education. Gandhi's conception of basic education was concerned with learning that was generated within everyday life which is the basis on which informal educators work. It was also an education focused on the individual but reliant on co-operation between individuals. There is also a familiar picture of the relationships between educators and students/learners. Lastly, it was an education that aimed at educating the whole person, rather than concentrating on one aspect. It was a highly moral activity.

II. EDUCATION THROUGH CRAFTS

Mahatma Gandhi had emphasized that handicrafts should be taught 'not merely for production work but for developing intellect of the pupils'. And, this idea has been implemented in schools as Socially Useful and Productive Work (SUPW) as per reports of landmark commissions and policy. SUPW is mostly perceived as a hobby; it could be embroidery, clay modeling, bamboo crafts, leather work, pottery and many other socio-culturally relevant creatively stimulating activities that have a potential for enabling livelihoods. When connected with skilling and vocational options, SUPW can transform the way children perceive manual work and impact their young minds positively towards dignity of work and labour. Being connected with the farm and the factory, Gandhiji's concept of basic education included manual work as a means to make education inclusive. He strongly believed in holistic curriculum, even in primary education that introduces children to work-experience through agriculture, weaving, carpentry and several other skills. This would help in balancing the danger of making education over-academic or bookish and influence mindsets positively towards respect for work and dignity of skills and labour.

This is an examination of the significance of Gandhi's social philosophy for development. It is argued that, when seen in light of Gandhi's social philosophy, the concepts of appropriate technology (A.T) and basic needs take on new meaning. The Gandhian approach can be identified with the original "basic needs" strategy for national and international development. Gandhi's approach helps to provide greater equity, or 'distributive justice' by promoting technology that is appropriate to 'basic needs' (food, clothing, shelter, health and basic education). Gandhi's social philosophy (Erikson, 1975 and Roy, 1969) has been neglected by most development specialists, with only a few exceptions (e.g. Chambers, 1983 and Charles, 1983). This analysis attempts to draw out some aspects of M.K. Gandhi's background and his thinking about swadeshi) i.e local self-reliance and use of local knowledge and abilities) and Swaraj (i.e. independent development that leads to equity and justice). Gandhi's ideas, which emerged out of an 'Indic' meta-cultural background, are based on an emphasis on equity. Appropriate Technology (A.T.) is particularly useful within the context of a basic needs approach to national and international development because use of A.T. is probably more likely to lead to equitable growth. The 'economic growth' strategy, utilizing 'advanced technology' (or even 'high tech') exclusively, has caused unemployment and has not led to effective 'trickle down', much less 'high mass consumption'. In many developing countries, the poorest 20% of the population are worse off in 1990 than they were in 1980 and, for that matter worse off in 2019 than they were in 2009. By making use of the 'advantage of backwardness' (Veblen, 1966) and viewing development in terms of long-term impacts, a basic needs approach using A.T. is more likely to lead to a positive impact on third world food systems than a pure 'economic growth' strategy.

III. GANDHIAN THOUGHTS ON SCIENCE AND TECHNOLOGY

Man does not live by bread alone. Economic advancement is good in itself; but that alone is not the aim of life. One eats to live; one does not live to eat. The aim of living is self-realization. The economic necessities need be satisfied, but material comforts alone do not bring happiness or advance social welfare. The test of advancement is the 'absence of starvation among its masses'. Economy should neither be no profit or competition based. Real progress must include, no less the moral advancement of the people. Gandhi supports an economic system that would not disregard the ethical values in the scheme of wellbeing. The ancient system of Varnashram Dharma, avoided both competition and exploitation, for this he accepts it as a good basis of restructuring the economic order. Accepting Ahimsa and Satya as the essential elements in the economic system, he lays emphasis on non-possession equitable distribution of wealth, bread-labour, Trusteeship and Swadeshi.

Machinery and Industry: Gandhi was convinced that the use of machinery is 'inevitable'. He was not against machine. But, machine, need only eliminates the 'unnecessary labour'. He would not like it to be used to displace 'human labour'. What he objects 'is the craze for machinery' and 'not machinery as such'. To him: 'That use of machinery is lawful which sub-serves the interest of all'.

The Best Planning: According to Gandhi, planning should aim at the fullest utilization of manpower. Any plan that exploited the raw material but neglected the manpower was bound to be 'lopsided' and incapable of establishing human equality. Real planning consisted in the best utilization of man in relation to the production and the distribution of productions.

Free India: A free India for Gandhi meant the flourishing of thousands of self-sufficient small communities who rule themselves without hindering others. Gandhian economics focused on the need for economic self-sufficiency at the village level. His policy of "sarvodaya" called for ending poverty through improved agriculture and small-scale cottage industries in every village. Gandhi at the same time was not against modernization. He was against worshipping technology as a lord of salvation. As he thought salvation can never be brought from outside but attained internally. When one's soul is intoxicated by greed, Gandhi thought technology inevitably represents it. He was not unaware of the role of tools in human uplift. In fact, he had great curiosity towards tools. He had accepted many of the modern technological inventions not as a compromise but as a necessity.

Gandhi's orientation to reject modern science and technology concentrated more on the materialist or anti / non-spiritual undercurrents of modern science and technology, the subsequent economic exploitation among peoples and countries and the resultant social disintegration. These figurative descriptions were part of the larger political argument against colonial subjugation. These opinions, particularly in the earlier phase, during the first decades of the 20th century, in a way were the protracted efforts to carve out or consolidate a space for an anti-colonial platform where the boundaries needed to be explicitly definite. Another means the Gandhian school employed to counter the technological determinism, particularly later, was by re-defining the location and content of science and technology by strategic political action. At one level, it analyzed the ongoing technological transformation both as arte facts and as systems reported from some or various parts of India. In most cases these innovations were part of the large, modern, technologically supported capitalistic driven ventures, as with, for instance, the case of sugar and rice mills.

He has favored for decentralized, indigenous, low technology options that are more physically and materially rewarding. For example, for pounding rice at the village level not only to distribute the wealth from the process, but more importantly on the 'scientifically proven' advantage of unpolished rice as the product, as the mill-produced polished rice 'lose some of (its) nutritive value because of the loss of per carp'. Thus, the re-definition of the technological process was often a functional prerequisite for appropriation. The process of appropriation intrinsically involved the rejection of technological determinism. M.K. Gandhi was a passionate opponent of modernity and technology, preferring the pencil to the typewriter, the loincloth to the business suit, the plowed field to the belching manufactory. Had the word processor been invented in his lifetime, he would almost certainly have found it abhorrent. The very term word processor, with it's overly technological ring, is unlikely to have found favor.

Gandhi, at the dawn of modernism, foretold most of the concepts put forth by environmentalists today. Now he is considered as a pioneer by environmentalists all over the world. One must approach him as a post-modern philosopher form the age of modernism. Gandhi thought about the shortcomings of modern technology and found out the major one to be 'self-sustainability'. Gandhi imagined a complete self-sustained society without exploitation. He formulated this idea on his book 'Hind Swaraj'. His dream is a nation of villages with small-scale cottage industries not ventured by modern technology. He proposed a way of life, receiving only minimum necessity from nature. Such a nation wouldn't be dependent on other nation, he said.

He is of the strong opinion that 'Machines have their purpose and they will always be there sharing their space among us. But they shouldn't ever knock off last set of human contribution from a working unit'. For example, "An advanced plough is great, but if one could plough entire Indian farmlands with a technology, thousands are left with no work to do and they, therefore, starve to death'. This was his view on technology in nutshell. Thereby, Gandhi emphasized on 'Gram Swaraj'. "Reconstructing our village is not possible until we reach a point when they are no more exploited. Large scale production and commercialization only gives way to competition and rigorous marketing leaching rural public at the end. So, we must look into the ways of making villages self-sustained".

The 'charkha' (spinning wheel) Gandhi took up has two sides to it. One as an economical tool. A plan he devised to employ thousands of weavers unemployed due to mass industrial production of British. History has it that it fed mouth of thousands for more than thirty years as a successful economical organization. On the other side, it stands there as on icon, a symbol of appropriate technology Gandhi proposed, a symbol of confidence on self-reliance. Gandhi's views over and over stress upon minimal consumption, acquiring just the needs from the nature. 'Nature can serve man's need but not greed' he said. He thought about giving them back to nature. 'Charkha' symbolizes these attitudes collectively.

Modern technology, which moved on dismissing Gandhi as orthodox, has drained most of our ground water resources over the second half of the 19th century. Three fourth of our forests are clear-felled. Our lands are dumped with non-

decomposable waste and buried with nuclear waste. Farming has become largely unprofitable hanging on to government aided subsidies. After all, poverty still exists.

IV. GANDHI'S SCIENTIFIC METHOD

For Gandhi, India was an ideal site for experiments on the self and he saw himself as a scientist experimenting to prove the fallacies of the dominant argument on science. Experience, he argued, enriched not contaminated his experiments. From being a serious critic of modern science and it's practice. This has been brought out in his writings on Khadi and through novel institutional changes like Basic Education (Nai Talim) and a 'post graduate research laboratory'.

Gandhi did not see science as an autonomous search independent of the individual scientist. In Gandhi's scheme, the agency of the scientist was of critical importance. The scientist had to be conscious and self-reflecting. He was not to flinch from the question of 'what should the scientist be working on'? He was clear that the right place of the scientist lay neither with the exploiting market nor with the stifling state, but with the people. All Gandhi's experiments in science attempted to carve out and articulate this domain. To guide the scientist was his favourite talisman: Whenever in doubt recall the face of the poorest and the weakest man whom you may have seen, and ask yourself if the step you contemplate is going to be of any use to him.

The duty of the satyagrahi scientist was to work on those areas that required 'tender nursing' which neither the state nor the market could institutionally provide for. This domain was large and had substantial scope for research. This considered and deliberate choice of the subject matter was the first step in his science. To aspiring scientists at the Indian Institute of Science, he pointed out the need to link external research to internal research. By internal research, Gandhi did not mean a private incommunicable domain of mystic experience but a public space where the questions of science, both moral and societal, kept within the purview of laypersons. Gandhi's science was thus to give voice to these inarticulate subjects as well, including the non-humans.

Through his experiments, he sought to articulate the concept of a community worker as a scientist. He has highlighted the need to embed the community in the practice of science. True progress of science would happen according to him once the satyagrahi scientist of Gandhi's science workers like Maganlal or Mirabehn were found or created. These scientists would then go about creating a text and manuals necessary for the spread of science. Though Gandhi's scientists were special, what he emphasized was the method, the fundamental possibility of every one being a person of science. Science was not an exclusive preserve of scientists working in laboratories.

Gandhi's scientist would have to reduce the subject to a science and to prepare treatises on sanitation. Thus, Gandhi was also articulating his notion of community workers who would break the barriers of the 'elite' and the 'subaltern' in their own lives. Swaraj could not leave out experimentation on the self- the educated middle class. Advocacy alone would not do. It is no use merely making speeches or giving lectures; we must make scientific experiments and declare from the house tops the results of our experiments. The future of khadi (and all his programmes) lay in workers not pursuing a Gandhian 'line' but in carrying out scientific experiments.

The practice of science Gandhi emphasized the required attitude for research more than scientific qualifications. In Gandhi's method, lack of resources could not be an excuse for not practicing science. Contrary to the emphasis on physical resources which have been the focus of science policy in independent India, for Gandhi physical resources had to be presumed instead on a strong and moral fundamental base. He wanted from the scientists' sacrifice and dedication first. More than money, Gandhi emphasized that, there was a need for persons with strong faith and willing hands. He wanted that the new generations of scientists make original researches and not be imitative.

He also sought to reconstitute the relations between act and value, science and religion in his method. By insisting that scientists are to provide meaning to what they do, he made it clear that he was not interested in more technical solutions to a problem. The role of a scientist lay not in the realm of fact alone but in creating meaning (value). To him they were not to be separated. Sahasrabuddhe has also explicated this aspect of the importance of the creation of meaning in analysis of the Gandhian concept of technology-practice. Gandhi related and connected diverse programmes with the Charkha. The Charkha for Gandhi was the symbol of a new technology – an new relationship of man with nature, a relationship that could be brought into existence only by active, mutually cooperating persons. It would be meaningless for him if people who did not value cooperation practiced it.

CONCLUSION

Mahatma Gandhi's concept of Technology for development primarily focussed on mechineless society, where the people of lowest strata of the society be fully engaged in income generating activities by utilising the local resources. He has advocated that manual work should not be seen as something inferior to mental work. For a country like India, the twin principles - self sufficiency and autonomy are the Key for development. That is why he has emphasised that handicrafts should be taught not merely for production work but for developing intellect of the children at school level. His social philosophy advocated the use of appropriate technology to exploit the local resources (both human and material) that

helps to provide greater equity or distributive justice to meet the basic needs of the people. He has favoured for decentralized, indigenous and low cost or appropriate technology that promote self-reliance, autonomy and Gram Swaraj.

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