

Innovations in Science and Technology can Compensate for Economic Disparities

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Abstract: Inequality in social status is the situation when opportunities, which the members of the society aspire for, are not available to them on the basis of the merits of the individual's eligibility, qualification and experience as is stipulated. On the other hand, certain factors which overlook the required criterion and by certain discriminatory procedures these opportunities benefit a few and instead of the intended development what results is a further escalation of disparities in the society. These discriminatory steps may be justifiable along the lines of empowering certain sections of people and reservations to backward classes, in order to hasten the process of bringing about uniformity and better cohesion in society. These provisions cannot be permanent features but should only temporary provisions. Gender differences and caste basis (mostly attributable to traditional practices, and remedially require better literacy and adult education: Aravamudhan, 2006) are typical factors which build up the bias (Aravamudhan, 2005), resulting in inequality. One of the consequences is the increase in educated unemployed in the society and causes wide desperation and discontentment with the injustice meted out by the disposals of the people at the helm of affairs.

Science and technology (Physical sciences, Life Sciences, Medical Sciences and Engineering Sciences in particular) can make the remedial process (desirably) a natural and gradual process rather than invoking adhoc measures. From the point of view of raising the average level of the standard of living, the micro aspect of attention to the living standard of individuals rather than merely the collective index by averages may not be adequate. Current trends of innovation in science (Aravamudhan, 2013) and technology seem to hold such flexibility as required by the adhoc measures and at the same time holding out the promise of improving the individual development index. Enhancing the efficiency of value addition to natural resources (raw materials being utilized by manufacturing sectors to produce materials for domestic consumption) is achieved by what may be termed as process innovation (Chidambaram, 2012). In the case of drug discovery and drug design research, the appropriate reference is made to product innovation. In this contribution it is intended to highlight the principles and concepts underlying these strategies, more to bring about the consequences of economic well being than to evidence by the statistical figures in favour or against these approaches. The method to follow in practice would come under the category that can be called an inclusive component in the specialized scientific activity, whereby the public can be informed of the nature of scientific activities. A feeling of participation thus makes possible better involvement in the self employment programmes which besides improving the economic condition makes the disparities more gradual – much less of a sharp divide.

Keywords: innovative trends, inclusive growth, smoothening disparities, public participation in scientist's occupation, micro level monitoring,

1. Introduction

At the outset, it is necessary to note here that this paper is more of a qualitative description of an outlook rather than retrospection. Critical analysis and inference of data for assessment of foregone initiatives is not the nature of the contents of this article. At the final section the nature of the discussion would be on the basis of the findings from a research conducted by an outreach to a public- a social awareness activity of a reputed physical sciences professional organization [*Royal Society of Chemistry 2015*]. The descriptive outlook in the next 2 sections would be substantiated in the further sections with instances that support the points of views; even though those instances may not be the results of independent research study carried out by this author, but they are instances encountered by

this author during the course of academic pursuit to specialize in a subject that is broadly in physical sciences.

Thematically, it is the inequality aspect that would be the focus in this paper. Disparities arising on account of a variety of causes can be reduced by initiatives in science and technology which can be effectively accountable as a step towards reducing economic disparities. This effectiveness can come about, not only reaching out the findings of science technology to the society at large but also transferring the know-how information, as much as it is relevant, to the educated and qualified section of the society. This is the context of Science and Technology education, which can encourage the educated-unemployed citizen to seek self-employment strategies. Thus entrepreneurial trends can be accentuated that make individuals useful for the social well-being, while improving the individual human development index. Thus the diffusive trends become effective in reducing the explosive trends of escalating disparities. This is the more durable way to achieve increase in average standard of living with the possibility of micro level monitoring paying attention to the standard of living individual members making the social economic development homogeneous.

The considerations sequenced above are the outcomes for which innovative trends are promoted. From the several novel methods (not really much of original inventions all the time), which become evident in science and technology, seem to usually arise out of a mixture of the need with desperateness for means to reach a goal. When there are means to provide a service/product for specific needs, in a developing country, it becomes necessary to be monitoring cost effectiveness all the time to further optimize to make it much more affordable than what currently prescribed rates are. When population growth has not been contained to the prescribed rate, and natural resources are the inputs to a process for value addition to produce consumables, corrective measures invariably depend on science and technology and to modify the existing production strategy, suitability to local conditions are the prime considerations. Such are the typical initiatives that come under the category of innovation. And the modified trends are referred to innovative trends. For science and technology innovation, surprisingly economic viability is more of a determining factor, rather than the scientific curiosity or intellectual pursuit of improving the skills Hence there is no specific prescription to inculcate innovative qualities but it has to happen stream-lined as the course gets set; it is a way by which people's talents become evident. It is probably more

necessary to recognize innovative qualities than searching for talents. There should be enough opportunities for such innovative qualities to get expressed. Disparities, more specifically social disparities enable a few to get access to the available opportunities and not equally to all the deserving. The Empowerment initiatives in the context of gender difference, steps like reservation policies for the backward and emergency measures of on the spot compensation in cash and kind for the needy or other ad hoc measures can hasten the process of restoring social justice, but may not bring about the required homogeneity and social cohesion as much durably. *National Incubation Centres* and the Call Centres established for the benefit of rural farmers are the typical initiatives which make possible the opportunities to be availed more uniformly, thus improving the economic standards with particular attention to the grass root level. Most of such facilities have come about by thinking innovatively in bringing science and technology to the door steps of common people, and innovative thinking comes about how to put the information technology into effective use than making available these I.T. tools for fissiparous trends.

2. Human Development and Human Resource Development

A student's task at trying to go through a learning process (*not conditioned by the assured income and the consequential strings attached to it*) must stand as distinctly different from an employee's job requirements, stipulated service conditions and terms and conditions of employment to ensure a regular payment assuring adequate earning power. Most of the time the academic learning pursuits cannot be simultaneously part of an individual's activity to combine with the routinely carried out work schedules under an employment. Thus the undirected free movement for learning *may not be rewarding much in terms of financial return* since at the learning stage the activities are essentially oriented towards individual's **Human development**. Whether educating people and turning out qualified students can be an industry or not is a point always under debate. At whatever level an individual can stand up competitively as a **Resource Person**, correspondingly an employment would be possible. Even as students, the way a subject matter is learnt need not be the same. The grades of students differ widely is itself an attestation to the fact that certain students have innovative methods of learning. This does not imply that those who learn innovatively would exhibit such individuality while on an assigned work schedule. . The innovative learner benefits the individual self and in fact causes an outstanding level as learner. The individual, who is innovative in an endeavour to improve an organization, contributes to the benefit of the many

that are part of the organization without undermining one own individual credits. S & T innovations stand for the later type reducing economic disparity, in the broader sense. This is a kind of certification to the **Human Resource Development**, for which the credit is to be shared by the individual who has been going through the **Human Development programs**, and the institution which enabled and facilitated Resource Development process during the Human Development. An appreciation of the distinction between the two in social activity is necessary to ensure desperation does not overwhelmingly impede amicably settling the inequality issues. **Human Resource Development** assures a maturity level to enable efficient **Material Resource Management**.

This requirement of having to develop human resources while seeking the efficient management of the material resources is itself beset with a complicated entanglement. It is so because the very same people, who would be consumers, should be improving themselves with the techniques of securing the resources for the people. Resource provision must be adequate in quantity and of the required standard in quality; for, as much length of time so that the people do not have to be concerned about having to reduce the consumption after getting used to it. Besides, use of one of the resources efficiently might upset the criteria for similar utilization of another resource material. This is the uniformity required in distributing the resource among the public if the resources are limited or depleting. Public distribution is a matter of appropriate management. On the other hand, limited-resource condition or the depleting-resource situation is not only a management strategy but the concern would be to develop alternate resources or non conventional resource material. This concern can be effectively redressed by what currently can be termed as *product innovation*. The product innovation requires a sound knowledge of the existing materials which meet the requirement, and how the same characteristics can be built into another material that can be made available more abundantly and durably. Genetically modified crop variety is a specific instance of such new products which can be better in yield and quality as compared to the conventional and original crops. If such hybrid crop is not a food material, but a plant variety meant to be grown for environmental purposes and is to be planted widely spread to avoid vitiating climatic conditions, then it is necessary to take wisdom of the local inhabitants besides the scientists established opinion on the novel crop variety. This is an obligation on scientists to be innovative and not only invention pursuits. Otherwise divided opinion in favour and against scientists' initiative (with all good intentions), would generate social conflict; this polarisation would escalate disparity and be a cause for *economic inequality*. In this instance

bringing the science and technology advantage to the people would bring about a social divide, and instead of reducing economic disparity, it would be the cause of such resulting inequality.

3. The R & D Activity in Industry and Academic Pursuits

The Research and Development activity is a directed science and technology activity where as academic research activities are learning pursuits; that is an individual pursues an activity enabled by that individual's expertise gained over the years. From the point of view of a standing in social importance, such academic research activity can nurture young talented person not mainly for an employment but more to bring out the potential individuals may have in providing newer avenues. Research Development related to industrial production and manufacture for the public market is a profit oriented enterprise. And the learning pursuits of academic nature are mostly no-profit-no-loss but individuals improve themselves to be resourceful in the society. To distinguish the R & D activity from the later academic activities, the description of "*win-win*" case is appropriate, and for the later it is appropriately described as "*no-gain-no-loss*" case. Then, the situation becomes critically compounded when it is a matter of sustainability of the academic research activity; this is the field for innovative thinking. When R&D activities become an elitist activity with the patent rules, and trade secrecies prevent the public access to get information, the activity of manufacturing materials for the public market becomes an exclusive matter, necessarily isolating the academic pursuits in educational institutions. This is a disparity arising in professional career which makes both the categories much less effective than that it could be. In this context innovative trends can bring about inclusion of less regimented non formal component and reduce the building up of disparities. The resulting absence of inequalities makes possible conducive economic growth for satisfactory distribution of wealth. That the distribution of wealth is satisfactory depends upon how much of mutual appreciation exists in widely different interest govern the different sectors. These kinds of disparities are the concerns of the policy makers who wish to improve the situation on economic disparities.

4. Perspectives on "General Public and the Researchers in Physical Sciences"

What really is the point that was made all through the previous sections is how much mutually appreciative the public are on the activities in widely different sectors. Specialized activities requiring higher qualifications must diffuse into the general public in the society,

and the common people must have an interested reach out to know about these activities (without giving rise to any interferences). What actually the situation is both the sides have an indifference to the other side – remain uninterested trying to be not interfering. These result in loss of rapport to such an extent it can manifest as a social disparity. The research conducted by the Royal Society of Chemistry, UK was to know how much the public in UK know about Chemistry, even if they seem to be appreciative of science and scientists. Also, how many researchers in chemistry know about what the public consider as the importance of chemistry for general public? Surprisingly, the chemists did not consider it a possibility when the research findings indicated that certain percentage of the general public was much informed about the special subject chemistry. This seems to point out a paradox that all the time that the concern has been that public would not know much about individual science subject so much; but the situation turned out to be that chemists could not know how much the public knew about chemistry, although the percentage of such people was marginal! Then, any resulting disparities, as pointed out above, could be due to the fact that Chemists have been unconcerned about diffusing knowledge among the public. Thus the innovation in science and technology is an avenue for reducing disparities. Thus the science and technology development must have an innovative activity in availing the information technology to provide for diffusing across the barriers. As a matter concerning health, an initiative by the management of Apollo hospitals to innovate with models in health care (Apollo hospitals, Hyderabad, 2013) is quite revealing. These hospitals have sophisticated facilities of health care with the possibility of telemedicine provisions, and these can be expensive and at the same time required inevitably for treating certain ailments irrespective of their social status.

Hence the models seemed to be to work out that these facilities can be availed by all sections of the society as and when it is a life-saving concern. Mostly in the in the interview documented, the activity related to health insurance was being thought of innovatively to make it better utilized than keep it out of reach for those who are economically less provided for.

5. Conclusions:

Thus the situation described above is all mostly a matter of futuristic qualitative consideration and less of evidencing any set back in trends from the statistics from the past. A conventional thinking of correcting for deviation was not the point at all, but the situation now even if now seems optimized, this can be improved by thinking out a modification of the criteria for optimization. Such an effort can be termed “innovative” than to describe as being

“unconventional”. Thus it is a refreshing novel approach that is called for more than simply speeding up what is presently in practice. This discussion is also about bringing about a diffusion across the barriers that gets built up because of increased speed of activities confining people to their own concerns vertically, than letting a broadening of outlooks. And, innovation in science and technology has brought about benefits which must be brought to the public highlighting the required innovative approaches. In the annual Indian Science Congress Sessions (Indian Science Congress Association, 1914), an exhibit is put up for those who have won innovation awards. These features most of them seemed to be coming about by the local talents in the respective localities (particularly rural areas) who went about modifying certain contrivances as and when the available materials were changing and tools have become more and more versatile to implement changes. It would appear on occasions that the reason as to how benefits have accrued has still not been scientifically discerned and it is worth revising and documenting the scientific principles underlying certain practices. This is a reverse-fall out to scientific investigators due to the acclaimed innovations. Such outcomes have benefitted the community economically and enriched the science in principle. These expressions do convey more of reality rather than merely qualitative optimistic dispositions.

References;

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