A New Dimension to The Poverty Problem — Education

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KEY WORDS Ecology. Education. Health. Energy. Diseases.

ABSTRACT In Human Ecology, everything is connected with everything else. Of necessity, therefore, we must believe in science as a whole. Given this complexity, the central issue is always the individual changing over time and at different levels of well being throughout the life cycle. Analysis of available data using ANOVA models confirms that health is not a set point but a continum, that is, it is a bounded variable and the variation between regions, between individuals within regions and between days within weeks, is hierarchical in structure, clearly pointing out the non-random source of variation. This does not however mean that the variation between individuals and within individuals is entirely genetic; in part it is genetic and in part it is the interaction between the genome and the environment in which an individual is brought up. The non-random nature of the variation ensures that the communication between mind and body, *i.e. Adhyatma* is automatically regulated by the endogenic systems in man. In humans, it is not the body that abides, it is the pattern of homeostasis that perpetuates itself. An individual, therefore, constitutes a dynamic bio-system which is self-replicating, constantly changing and potentially mutable, a bio-system which has to depend on human and physical forces as well as the inter-play between the mind and the body. Good health corresponds to stability, normal functioning and homeostasis. Ill-health corresponds to a state of instability, loss of control and failure of self-regulation. Briefly, man's health depends upon the balance of external and internal environments and absence of dietary and disease insult.

1) The need for educational reform has never been greater that it is today. This is especially true of rural areas and of schooling geared towards rural development. Even the meaning of communality and poverty and their implications for the basic secular concept underlying our democratic form of Government are not clear to most of us. We are undoubtedly a poor developing country but we do not realise that poverty as we understand and define it cannot provide a complete picture of the state of well-being of the rural population. The reason is that these estimates depend on surroundings, *e.g.* sanitation, potable water, pit latrines, etc. and these services are normally run under the authority of Public Health Administration. It follows that private household consumption expenditure that we estimate to define the poverty line cannot cover them under our constitution. To take one example, we know that the number of days annually lost by school and pre-school children due to episodes of diarrhoea, dysentry, upper respiratory tract diseases, etc. is some 20%. The result is that no sooner a child is recovered from one episode he suffers from another. This frequency of episodes of disease is particularly large among low caste children. One has only to look at the results of food intervention under the ICDS project to verify this. So heavy is the prevalence of disease that children fail to show any benefits in respect of their health from these interventions.

Surely this is not something one would expect if inadequate food were the sole reason for the low stature of our children. It simply means that public health administration is not carrying out responsibilities entrusted to it under the constitution.

2) The implications are serious. Bluntly stated, it implies that when poverty line is defined as a level equal to the calorie norm we unwittingly harm the interests of the backward castes in profiting from the programmes for the poor. The best test of whether this is true will be to increase children's intake to the level of the norm as we do in ICDS project and watch the results.. It is found that our

children, especially those from backward castes, do not gain weight to match the Harvard standard. The basic assumption that the norm provides a minimum standard of living has therefore no basis to support it.

3) The level of calorie intake becomes meaningful if alongwith the norm we also dwell on the meaning of intra-individual variation. In particular, it is imperative that even though we use norm to anchor poverty line we need to have evidence of structured pattern of variation so essential for understanding how the mind controls the brain. Only then we can be sure that intake, even when it is lower than the norm, can have the capacity to use the food energy more efficiently than a norm. The nearer we are to the norm in constructing the poverty line the more we will be discriminating against low castes in preventing them to reap the benefits of the grants that Planning Commission makes to alleviate poverty. Making allowance for non-food consumption does not solve the problem. Reservation of posts without providing opportunity for education, service, and production oriental approach is even worse. In this respect we are not very different from the Blacks in U.S.A.

4) We have carried out a very detailed assessment of ICDS. Broadly, our finding is that around 1/3rd of the village centres under ICDS remain totally closed. A 2nd 1/3rd are open for about 2-3 hours a day and no more. A final 1/3rd of the centres are run with enthusiasm. They do what they are intended to do. But having said this, the fact remains that we have little or no evidence of the improvement in nutritional status of the children. The broad picture that emerges is that over one half the children are small in sature *i.e.* below the 90th percentile of the Harvard Median. Nutritionists interpret this to mean that inadequate intake is the major cause of this situation. On the other hand, a longitudinal follow up of children in the field shows that food intervention with intake equal to that of counterpart children in USA have not materially improved the situation. They have failed. The question as to why our children remain small inspite of food intervention thus remains unanswered.

5) The answer is to be found in the interaction between the child and his surroundings. We seem to forget that health has a social aspect with gain in body weight varying with caste and hence with personal hygiene and surrounding environment. This has not been taken care of in ICDS nor in IRDP. This is the major flaw of these projects. There are several other studies carried out in villages around Pune. They all confirm that diarrhoea and respiratory diseases are the most common and dangerous diseases among children. Actual examination of stools confirm that one out of every 2 episodes is bacterial in origin thereby pointing to the annual prevalence of diarrhoea of the order of 40 to 50 %. The high mortality that we find in children is in fact the result of this high prevalence of morbidity. We are therefore not surprised that our children are not able to use food to gain weight and height. But we find it difficult to understand why nutrition experts demand food intervention at all under these conditions.

6) Almost every school in India has a programme of food intervention. The total programme is so massive that it costs the Government some 100 crores rupees a year. It is not cost effective either. We do need food but alongwith food we also need potable water, adequate disposal of excreta, good sanitation and personal hygiene to reduce prevalence of morbidity before initiating feeding programmes. Indeed, we need much more if we are to remain faithful to the concept of secular form of democratic government.

7) We have even wondered as to why the interests of our people in environment is so passive and in food so active? Even rats are active in exploring surroundings to contribute to their survival. We seem to behave more like Pavlov's dog when what we need is conscious mind-brain interaction to initiate negative feedback to restore order whenever there is

disruption. Available data show that diet and disease move in concert to show synergistic interactions. If someone is suffereing from diarrhoea not only that person will have low intake but he or she will be unable to effectively assimilate what little is eaten because of the rapid food transit time and disturbance in the absorption mechanism. The majority of illnesses tend to synergise malnutrition both by demanding higher energy intake to meet the rise in BMR which accompany fever and by requiring higher intake of protein and other nutrients to form antibodies to fight the illness. It is this negative co-relation which Japan used to formulate her policy in postwar years to provide water for drinking, pit latrines to dispose of excreta, sanitation to control breeding of flies and mosquitoes and education in pre-primary and primary schools to improve personal hygiene. I am not therefore surprised that Japan added some 12 years to increase life expectation of her people during the immediate post-war decade. It is not exaggeration if we say that most of us have not cared to study our constitution.

8) A child with infection will not grow. It is not therefore so much the intake that determines work capacity, it is the control of disease that matters. Continuing food intervention under these conditions is to encourage growth in spurts and to waste our resources. Clearly PHA does not carry out its responsibilities that constitution has entrusted to it. It is not surprising therefore that our engineering students feel so despondent about their role in the society. The conclusion we reach is that our programme needs to be restructured. Behind this failure lies the lack of understanding of what is known in literature as SEM Hypotesis. This is a fundamental hypothesis in recent development of biology. If food interventions do not show gains in weight comparable to that recorded in US children then our children will have no alternative except to adapt themselves to low levels of sizes and low levels of productivity. It is believed that such adaptation will lead to increasingly low productivity, low level of income and low intake and hence still greater poverty. However, when this hypothesis of vicious cycle is examined we find that it is untrue. In all such studies of economic activities it is assumed by default that much of the potential working time of a villager is dissipitated in enforced idleness. In reality, we find that the poor work for longer hours and are fully employed in work of low productivity. Broadly the poor men work for 60 hours and women 70 hours per week. Space doesn't permit more elaborate discussion. A key factor in these data is that the time spent in recreation is not included in productive work time. The broad conclusion we reach is that there is hardly any relation between the productivity per unit of time and food energy intake. Such a phenomenon is impossible to explain unless food energy is metabolised into work output with decreasing efficiency as the intake increases, as indeed, we find, the case to be in all our experiments in India. The table 1, based on observation on 54 adult subjects for 6 days at a time at intervals of 8 weeks over one full year speaks for itself. It will be seen that the calorie cost of the work output for the high intake group is about the same as that the low intake groups.

Table 1: Results of the pilot study on 10 individuals

	Mean energy intake in Kcal	*BMR/ minutes*	*Ht. cm.*	*Wt. Kg.*	*Basal need for 24 Hrs. (Kcal)*
High intake group	2754	1.32	162.0	52.1	1900
Low intake group	1773	0.68	161.6	52.8	980

The analysis of variance of the same data is presented in table 2.

It will be seen that the mean square between individuals is significantly larger than the mean

Table 2: Anova for energy intake (Kcals x 10)

Source	*d.f.*	*M.S.*	*F.*	*Estimates of true variance*
Between subjects	53	149.9	3.12	$16.5=\sigma_b^2$
Within subjects	270	46.6		$46.6=\sigma_w^2$

square within individuals. There is thus a clear evidence here of the non- independent hierarchial structure of variation. This means that the differences between individuals cannot be attributed to chance only. Part of these differences are real differences representing genetic potential for coping with variation in energy intake and the remainder has its origin in environmental within the intra-uterine and external environment experienced by him.

9) Intra-individual variation when broken down by weeks and days within weeks shows the same non-independent hierarchial structure. It implies that the genetic-physiological process of energy metabolism does not remain the same each day and has its origin in the interaction between the genetic entities possessed by the individual and the micro environment provided by the food intake on different days.

10) The economic significance of lack of co-relation between human energy intake and productivity is vast. Normally it will be impossible for India to compete with more developed countries if productivity mainly depended upon energy intake. Fortunately, we have feedback mechanism in our bodies which can compete with modern technology. Our evidence is conclusive that higher the intake, higher is the energy expenditure on maintenace. Thus a person who eats 10% less than his habitual intake will find that his BMR is also reduced by about the same %. Man's capacity for work is therefore not determined by his intake but by efficiency with which he converts food energy into metabolisable energy over his homeostatic range of intake. We will resist the temptation of going into further details of how the mind controls the brain in keeping with the moral and social philosophy of *Adhyatma* that guides us in our education. It is *adhyatma* which is the core of our teaching and helps us to regulate the mental process and its implications for the interactions between man and surroundings.

A few statements to bring out meaning educated reform will be in order.

11) In a toxic environment that we live with insecticides, herbicides, pesticides, preservatives and colours used to prolong shelf life of the products there is an urgent need to give higher priority to protecting ourselves from the adverse influence of environment. The point was especially stressed at the Brazil Conference last June. Nothing will probably help more than persuading modern technology-based industry to ensure that no product is put on the market until it statisfied the criteria for clean environment laid down by Governments or alternatively there is assurance from the pharmacy that the product also contains nutritional medicine in the form of iron, zinc, magnesium, calcium and other nutrients to give us the protection that we look for. To omit these micro-nutrients from our diet is to risk Western diseases for it is common experience that when we change diet and placed of residence from South to North, we also invite with it change of the disease pattern. Cancer and cardiac diseases that we experience are the result of such change. Increase in blood fat and cholesterol are other examples. Part of the change can be explained by genetic difference, but the remaining part can only be explained by interaction between individual and his surroundings as also by variable efficiency arising from homeostasis that governs the stability of our cells in changing intake into work output. There is no simple way of dealing with the problem of toxicology in environment when modern technology has forced this change of speed on our lives.

Ostensibly, it is done in the name of increasing the shelf life of our product but it can

also be a part of greed for profit. On the other hand, what appears reasonably good, has now become a necessity for we have no means of knowing whether out of the large number of micro nutrients present in our diet, we are in fact receiving what is optimum for health, or short of optimum or even exessive. The element of risk will probably continue until evidence in the form of clinical trials comes in.

When economic reforms are international in character and demand and supply for product is governed by international trade and activities, we simply have no way out other than ensuring that technology is so developed as to meet needs of humanity. No amount of change in nutritional diet can possibly meet the dangers ahead of us. I can well imagine release of free radicals in quantities so large as to prove a meance to the health of us all. Talking of meance is easier but the moment we connect with it profits that we may lose from selling arms and products we find ourselves in a dielemma. It is a strange world. There has to be a meeting of the minds and brains lest we may unwittingly move towards destroying ourselves. Only *Adhyatma* and the self-discipline in the form of self-control and restraint will finally provide the saner path for the development of our rural areas.