

## Environmental Education and Rural Development

1. India and the World: India is now the second most populous country in the world, second only to China. India has only 2.5 % of the total, area of the world but 17% of the world population to support. And this population is increasing out of control that is why India is a poor country. Our annual national per person-income is Rs4550 whereas; among our neighbors only Bangladesh and Burma are poor than us. Pakistan, has Rs 5250, and Sri Lanka has Rs 60,000 while the "developed countries of the west" are around Rs 1,50,000, USA being over Rs.2,55,000. (ref; Statistical Outline. of India; figures in dollar's converted to Rs by @=Rs.15;1985-86-Tata Services Ltd). we may console ourselves that happiness cannot be measured by wealth alone. But nor can a starving man be a happy man.
2. India in the Developing World: India is gifted reasonably well by Nature. We have plenty of sunlight, a good-average annual rainfall, a fertile land, sufficient coal, iron and other mineral resources and a fairly hospitable climate all the year round. This is why among the human species, a big section settled in this land and developed one of the oldest and still surviving culture.

But what have we made out of this nature's gift? We are today ranking low even among the Developing world-in terms of productivity, well being etc. But we are fairly high up in the number of educated people and the skills that we can practice. But this intellectual asset is not spread over the whole population, but only in a section of the society. If only we spread it to all, we can be at the forefront.

Our lack of skills is conspicuous on the agriculture front. We produce 17% of the world's rice but our average yield/ hectare is 20 quintals, while China produces 54q and Bangladesh produces 24 and Burma 29; Japan has the highest 62q /hectare. The story is repeated in Groundnut. We produce 22% of the world's groundnut but not very efficiently; our yields of groundnut in shell, are 700kg/hectare, Burma is 1000, China is 2000, and USA is 2600 kgs /ha. Wheat is a better picture. We have an average of 2000 kg/hectare and UK with 5900 kg/hectare, is the highest. China has 3000 kg/ha. USA has just 2500kg/ha. But this should give hope that we can increase our agricultural output several folds, with the same land. Under cultivation. That is the basis of our Development Opportunity-increasing productivity in our agriculture and industry.

3. What is an opportunity? What is Development?

We see turmoil all around us. We see misery, suffering and frustration. Certainly, we are not a happy nation. But we see smiling children playing even in miserable & surroundings. There is hope and there is potential. If all the youth can aspire to making the best use of their faculties and live a life with pride, that will be our aim for development.

When we see a problem and we have possible solutions to these problems, these are opportunities. And will see that we have unlimited opportunities.

Then what is holding us back? The Will and the Effort. Ours is an ancient culture, of which we should be proud. If we practice what we profess, we should be well on the way to development.

Our development has to begin with self. Our culture prescribes, Bhakti, (Commitment) Karma,(action)and Gyan,(knowledge). If we have Bhakti in our Karma, the activity will succeed. If we keep our tempo in Karma, with Bhakti, Gyan will be acquired. This will be a sustainable development. This is what all our

sages from the ancient to the recent have prescribed, but we have ignored the a and the result we see around.

4. The Wealth of India

India is gifted with adequate total rainfall/precipitation. We have the Gangetic valley, one of the most fertile alluvium tracts. We have around 300 days of intense sunlight and an equitable climate through most of the year.

We have around 56,000 million tons of coal, 9000 million of iron ore, 2000 million tons of bauxite for Baking aluminum, over 50 million tons of manganese ore, 129 Billion tons of chromite ore and not inconsiderable amounts of copper; zinc, lead etc. (ref Statistical Outline of India.)

We are not well placed in regard to petroleum products; our reserves are estimated at 600 billion tons and output only 1% of the world output.

If we look at Japan, they do not have even what we have. But through sustained effort they have built up the wealth; for the nation.

We have a good climate for growing the organic materials, and we have adequate mineral and water resources. We should therefore make the best use of our main resource the human resource.

We should look at history and plan our strategy.

4. Evolution of Industry

In the history of man, collective hunting, the invention of fire and its use for cooking food, could be considered as the beginning of industry. Later came the agriculture, only about 10,000 years ago and the domestication of animals. This gave rise to production of surplus goods. That means, the producer had something for his own needs and more, which he "traded" with someone else in exchange for goods. This is the barter economy. Production of surplus food by agriculture led to some people shifting from agriculture to other activities such as Baking tools, helping in making shelters, arts, trader just philosophy. This production of surplus resulted gradually, in segregation of activities, ("trades"), development of knowledge as an activity, and formation of settlements based on activities other than agriculture. These became later the cities.

Initially, agriculture was the major producer of wealth and land was the prime asset. Those who were; strong controlled the land and; dominated over the rest. This gave rise to landlordism. This continued for thousands of years. Around 300 years back, came the inventions that allowed man to use energy from coal and other fuels. This led to factories where manufacturing activities were organized and the industrial revolution came about. This increased wealth rapidly and gradually, wealth from industry became more important than wealth from agriculture. By this time barter trade had to give way to the money economy. Money Capital became the most agriculture need for setting: up and operating industry Landlordism faded into background and capitalism took over. In the industrially developed nations, the % of the population dependent on agriculture dropped down to around 10% even less. Even with this small number they could produce enough food for all and to spare.

With the growth of industry to manufacture goods, rose another industry to give service. As industrial development grew, life became more complicated, giving rise to specialization, needing help from others. This help from others

was required, because of Specialization and/or because one did not have time to do that job himself. Thus when electricity became widespread, help was needed to install and repair appliances. Or when factory culture spread, one had to spend time traveling and the transport services as well as domestic help became necessary. Thus the service sector of industry started and grew rapidly with increasing complexities of life. Today the service sector is the fastest growing industry.

#### 6. The Information Industry and the future

Along with industry grew the importance and complexity of taking decisions, organizing and planning. This became the art and then the science of management. Management of technology gradually became more important than just acquiring the technology. The way a management functioning is critically based on information and how much, how accurate and how fast, one can handle it. This is why the telegraph and the telephone services exploded. Then came the semi-conductors and the computers. This has now given rise to information Technology and we are now witnessing the second industrial revolution that will bring a new class who will gain control and push back the landlords and capitalists. Those who master the information Technology will master others.

The growth of agriculture saw man using animals for his own gain. The industrial revolution saw him using machines using other energy sources and increase his output manifold. He also developed techniques of "mechanization" so that less skilled labour could produce goods that formerly required more skills. This meant, one with greater skill could put his skill into designing a machine which could later, be used by a less skilled man to produce goods continuously. This led to an exponential growth of industry. Yet the management of that industry was an intellectual skill that was not very easily available.

Now the coming of the computer and the Information Technology is bringing the higher management skills within the reach of the less skilled person to collect, store and retrieve selective information and even use expert systems to take routine management decisions. Computers are to management what jigs and mass production, machines were to manufacturing industries,

India lagged behind when the industrial revolution came we are still to catch-up with it, we cannot afford to miss the Information Technology revolution. On the contrary, we should use it to catch up on the industrial revolution, as well. The basis of the information technology is of course the collection of information and this is done by humans. It is most important that we train our rural youth in the matter of measurement and systematic recording of this information. Unfortunately we are culturally weak in this.

#### 7. The Technology Ladder:

The real world of work is the best education. For working people are constantly learning and improving their skills. Some learn faster than others. Those who learn, now make more value addition in their work than before. This brings them more in coffe. Their time is now more valuable. Their wages go up. They have perforce to use their time for more sophisticated products. Therefore they change over gradually to more sophisticated products and stop making the simpler products.

This gives rise to a technology ladder. Each technology on this ladder needs more skills than the one below. So any one who "steps on" to this ladder, slowly climbs up the steps and vacates the one below. Thus we need to train people enough for them to be able to manage a small "industry". They will then climb up on their own user it.

The skills required for management of technology are basically, simple accounts, decision making by rational thinking, planning, purchase of material, dealing with clients) and looking for new opportunities. It is the skill in these that propels an entrepreneur upwards.

This also makes it obvious that one cannot crash land directly into a high risk venture, if previous experience of management of technology is lacking. Therefore, in dealing with the rural/ weaker sections, it would be an advantage if (Management skills are given by on the job training in work stations operating on commercial or semi commercial basis. These can be simpler ventures such as agriculture related small industry such as poultry, dairy etc. or small workshops, service groups etc. These would be better launching pads for new entrepreneurs than just training courses.

The technology ladder concept helps to identify where to start new enterprises, where the earlier ones are prospering; this is why cities and industrial centers grow, exponentially.

8. Which Industry do we need most?

Industry is a planned activity concerning production of "Health" using available resources, it is characterized by planning, cost control, process control, continuous monitoring, consciousness of productivity and long term interests and application of scientific and technological knowledge. Thus agriculture can be an industry) though it is not to day; poultry is fast becoming an industry. On the other hand, most of the so called "village industries" are crafts and not industries in this sense.

The first priority should be to make agriculture an Industry in the above sense. This should increase its productivity, but will make some labour surplus for who, we need to develop agri based industries, like the following.

The first three, are animal feeds and the figures of deficits are from ICAR Agriculture Hand Book. The prices are very modest by current standards. They should be considered for order of magnitude. Edible oils and grains deficits are well recognized and given for comparison.

The points to be made are;

1. Agri based industries should be no

1. Priority in rural industrialization. They are much bigger in order of magnitude than the conventional industries we could consider for rural industrialization.

The scope for S & T input, in these, has largely been neglected. Thus green fodder is a very profitable crop for the farmer and can be processed into silage and blended foods for animals. Dry fodder can be chemically and/or microbiologically treated to upgrade nutritional and market value. Biotechnology will bring in further progress. Composting has to be an industrial operation

2. Such broad based industries have also a great potential for ancillaries. The above for example will have construction, workshop and transport as key ancillary industries. Key because S & T input in these will, alone, enable the final cost to be brought down, low enough to exploit the full potential market. There will also be backward and forward linkages.

3. The value addition will be mainly in the rural area and has scope for dissemination to landless people.

4. Products have nation wide markets and marketing Bill be therefore simpler, if technology keeps the prices down. The figures are the shortfalls and not production figures.

5. The products will directly lead to raising of standards of living and health. There will be additional employment generation, not only from these industries, but also because the products increase the size of the client industries.

6. Compared to any other "industry" the turn over potential is order .of magnitude higher.

7. The need is not so much new technology but application of current technology with the industry approach. Here the human resource development will be the key action point.:

8. In starting of a new enterprise, one should not look only at the technology package, but the total operational package. Particularly, the marketing of the product. In this the agri based industries above will have a great advantage.

9. Any subsidy on cost in a new technology should be avoided. Government may bear the cost of development (overheads, wastage and excess labour cost in development stage). The government should insist on having cost projections for the post- development stage assuming the, process development is successful.

10. Types of Industry:

For the purpose of exploring potential, we shall classify industry as agricultural production, manufacturing and service industry.

The agri-production industry will include forestry, farming, horticulture, dairy, poultry, feeds, etc.

The manufacturing industry will include consumer goods, machinery, gadgets etc.

The service industry includes, repairs, small fabrications transport, supply, education, entertainment, health service and retail trade, restaurants etc.

The agri-production industry is characterized in our country and generally by less skilled work forces, more dependence on weather and natural forces.

The manufacturing industry is characterized by bigger scale of operations and generally competition, sophisticated marketing and management requirements.

The service, sector is characterized by the key role of the human element. It is also characterized by automatic growth of the total sector with development and consequent increase in complexity of life.

The industry can also be classified according to the materials on which it is based or the products it makes. Thus we can have Foods, Beverage, textiles, furniture, paper products, leather products, personal products, rubber goods, petroleum products, chemicals, drugs, electrical and electronic goods, plastics, machinery and capital goods crafts, etc. The list can be, endless.

It will not be useful to discuss the characteristics and scope for new enterprises in each. Apart from the effort needed to collect such exhaustive, and upto date information, the validity of the information will last, only a short time. It is best therefore to describe, the mythology suggested for identifying opportunities for new enterprise.

However, the following information regarding some industries will serve to illustrate the points. The figures given indicate value added and not net value. Value added is the total output value less the input value. Thus value added indicates the value of skill and technology input.

Agriculture	Rs 70,000 crores		
Food and Beverages	2700 crores	Textiles	3,600 crores;

Paper, leather, rubber etc.	3000 crores;	Chemicals	4,000 crores,
Steel and other metals	4000 crores;	Machinery	5,000
crores;			
transport equipment	2300crores;	Miscilaneous	1,500 crores.

(ref : Statistical Outline of India Figures rounded and grouped.)

The point to not& is that agri based industry should be our Not priority.

#### 10. Why Profit:

Any body who runs an enterprise ii fared with the question of how such profit should each operation earn. Those who get wages also bother about the fair wages for a job. The open market system leaves the answer to market forces. Bat basically .why is profit desirable?

A short story from a school book gives a beautiful moral.

A colony of 100 lives on a hill. Every one had to spend 1 hour per day to bring his own water requirement. One enterprising person spent his own time and labour and built a system to bring the water to a tank in the