

Vision for Holistic Technologies, Production Systems and Management Models

As discussed in Chapter-13, the right understanding provides us the vision for a holistic alternative. It provides the vision for *mānaryā yatasthā* – a model of living which is inherently conducive to the needs of all human beings and also compatible with nature; a model which is conducive to the development of harmonious human society at a global level; a model which paves way for a sustainable, universal human order leading to happiness, peace and prosperity. Of course, such a model will necessitate the visualization and development of appropriate technologies, production systems and management models which cater to the comprehensive human goal of *'samāhāna, smṛiddhi, abhaya* and *subhāritva*'. It will be necessary to develop and popularize technologies and systems conducive to human welfare – to *abhyudaya* or *sarvodaya* and not merely focus attention on economic growth.

The development of such systems and devices requires right understanding and a close scrutiny of the systems and processes of nature, as these are all basically holistic, time tested and self regulated. Of course, there is an ample scope for creative processing on the part of human beings to make them more conducive to human use. Further, it will also require a careful learning from some of the traditional practices, critically examining them so that we are able to identify their strengths and desirable features and retain them while evolving technologies and systems for our present needs. Only then we can appropriately harness the store house of traditional wisdom along with the present day knowledge of science and technology. In this chapter, we will try to identify the salient criteria for assessing and developing appropriate technologies, production systems and management models. Thereafter a glimpse of such systems will also be presented through typical examples.

The Holistic Criteria for Evaluation

The modern technologies and systems are all human inventions in response to the needs visualized under the influence of the prevailing worldview. Accordingly, they have been designed and optimized to the objective functions best suited to this world view. In order to facilitate the development of holistic technologies and systems, it will be necessary to visualize alternative objective functions and to formulate appropriate criteria for evaluation compatible with comprehensive human goal.

Generally speaking, there are three broad criteria to guide the development of such technologies and systems, viz.,

- (a) Catering to appropriate needs and lifestyles,
- (b) People-friendly, and
- (c) Eco-friendly.

In addition, these have to promote local self-sufficiency and optimal utilization of local resources and expertise.

In accordance to the above general considerations, the specific criteria for judging the appropriateness of technologies, production systems and management models may be identified as follows:

Criteria for Technologies

The above mentioned general criteria can be itemized into more specific form as follows:

- Caring to real human needs
- Compatible with natural systems and cycles
- Facilitating effective utilization of human body, animals, plants and materials
- Safe, user-friendly and conducive to health
- Productive with local resources and expertise as far as possible
- Promoting the use of renewable energy resources
- Low cost and energy efficient
- Enhancing human interaction and cooperation
- Promoting decentralisation
- Durability and life cycle recyclability of products

For Production Systems

In determining the type of production systems, the key questions to be answered are:

- What to produce?
- How to produce?
- For whom to produce?
- And how much to produce?

All these will be decided in the context of availability of local natural resources and the needs of the people for any given community. Of course, the needs are to be characterised in consonance with the comprehensive human goal. The specific criteria to judge the appropriateness of the production systems may include the following:

- Optimal utilization of local resources and expertise
- Economic viability and sustainability
- Priority for local consumption
- Matching the pattern of production with the availability/ producibility in the local environment and the pattern of consumption
- Decentralized systems capable of meaningful employment of people in the community
- Facilitating production by masses and not mass production in a centralized mode
- Promoting individual creativity and sense of accomplishment
- Using people-friendly and eco-friendly technologies
- Ensuring requisite quality of production
- Safe and conducive to the health of persons involved in production as well as others

For Management Models

The management needs to focus at the fulfilment of the people involved in the production system as well the users of the produce and not to profit-mania. The following criteria can be chosen for a humanistic management model:

- The whole unit working as a well-knit family
- Cooperative and motivational

- Ensuring correct appraisal of human labour
- Targeting employer-employee as well as consumer satisfaction and not profit maximisation
- Sharing of responsibility and participative mode of management
- Continuous value addition of the persons involved
- Effectively integrating individual competencies and complementarity

Critical Appraisal of the Prevailing Systems

It will be educative to critically examine the characteristics of the present models which have been developed under the influence of the materialistic worldview. It is important to point out that the structure as well as the use of all human innovations is strongly influenced by the worldview and values. Therefore, the present day technologies and systems are designs best suited to serve the prevailing worldview. This way, we can easily appreciate how the present day systems, even though they employ the best of human ingenuity, latest scientific knowledge and sophisticated technologies, are largely proving to be incompatible with ecology and also not conducive to sustainable human welfare.

The most concerning feature of the present day systems is their heavy dependence on non-renewable sources of energy/materials rendering them unsustainable. The modern development primarily dwells upon fossil fuels which are being consumed at exponential rates. This has caused menace of resource depletion on one hand and environmental degradation manifesting in the form of pollution and global warming etc. on the other. There is no compatibility with the rate of consumption and the rate of production in Nature. The other undesirable characteristics of modern technologies and systems include their centralized configurations, promotion of wastefulness, excessive transportation and substitution of human, animal and other natural resources.

These systems are becoming more and more complex and large in size, and they are highly capital and energy intensive. Increased automation and mechanization is being used for promoting mass production which is not conducive to large scale employment of people. Such systems also lead to exploitation, alienation and conflict between the so-called working class and management. In spite of a high degree of sophistication, quality consciousness, standardization, miniaturization and user-friendliness, these technologies and systems are not proving conducive to general human welfare. It is an irony that with all the technological advances, we have come to a passé where the whole planet is under a serious threat.

Learning from the Systems in Nature and Traditional Practices

If we really wish to gain an insight into the holistic systems, we have a lot to learn from systems of nature and from traditional practices. With modern developments in science and technology, and their widespread application, an impression has grown that the nature is primarily for exploitation as per the whims and fancies of human beings, the nature has to be tamed/controlled and exploited for human enjoyment. Further, it is believed that the systems in nature are all primitive and have to be replaced by man-made systems. This is how one looks at 'development'. Similarly, it is also believed that the traditional practices are all obsolete and have to be rejected outright. This arrogant attitude towards nature and the traditional know-how has caused much damage to humanity in recent times. It is high time we critically examine these beliefs and rectify them in the light of right understanding.

In reality, nature is not only our nourisher but also a learning ground. The human beings are an integral part of this self-sustaining nature and it is essential to understand its functioning and systems to live in harmony with it. After all, it is only by diligent study of nature that all the laws and principles governing various processes have been discovered by human beings. In a similar way, the systems and cycles of nature also need to be understood and emulated as required in man-made designs. Then only, we can correctly visualize and evolve the holistic way of living.

As for the traditional practices, it is true that with increase in knowledge and skills, and with changing needs, it is necessary to make improvisations in technologies and systems of human use, however, in order to do that it is essential to critically evaluate their strengths and weaknesses. It is important to identify the characteristics which have enabled the traditional practices to serve humanity for long periods. The eco-friendly and people-friendly characteristics of many traditional practices are very much worthy of our recognition and retention. Then we will be in a better position to utilize our present day knowledge to augment the systems and make them more effective, efficient and more suited to current needs. For example, we can learn a lot from the traditional practices of eco-friendly agriculture techniques, watershed management, eco-restoration, herbal formulations, preservation techniques, artisanal practices and so on. It does not amount to going backwards but rather enables us to avail from the vast storehouse of wisdom and experience so that we become better prepared to take the leap forward in the right direction.

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Topics for Case Studies

- Renewable and Decentralized Energy Technologies

- (a) Biomass based Energy Conversion systems such as:

- ◆ Systems for generation and utilization of Biogas obtainable from anaerobic digestion of all kinds of moist biomass such as animal and human excreta, kitchen waste, moist agro-waste, sewage effluents etc. This bio-conversion also results in production of valuable bio-manure in the form of slurry. Therefore, a study of slurry handling systems is also relevant.
- ◆ Systems for generation and utilization of Producer gas obtainable from partial combustion of all kinds of dry biomass such as wood, charcoal, rice-husk, sawdust, dry agro-waste etc.
- ◆ Systems for decentralized production of Biodiesel obtainable from esterification of various vegetable oils.
- ◆ Decentralized systems for production of ethanol as a liquid fuel for engines obtainable from agro-waste
- ◆ Technologies for Briquetting to obtain a compact/smokeless solid fuel from all kinds of loose biomass.
- ◆ Technologies for smokeless and energy efficient cook stoves

- (b) Gadgets and Implements to facilitate efficient utilization of Human muscle power and Animal draught power such as:

- ◆ Human operated agricultural tools and domestic appliances
- ◆ Animal (bullock) operated irrigation pumps, tractors and other agricultural equipments
- ◆ Improvised designs of animal driven carts

- (c) Devices for efficient utilization of Solar energy such as:

- ◆ Solar water heaters, solar cookers, solar driers etc.
- ◆ Solar Photo-voltaic systems