Natural Environment and Irrigation

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THE MAIN OBJECTIVES of irrigation management is to: (i) provide adequate water to farmers for successful cultivation, and (ii) control excess water that may be harmful to human beings or crops, such as floods, water logging, salt intrusion, etc.

Meeting the water needs of farmers involves collecting, transferring, delivering, controlling and the disposal of water. Water is transported from a source such as temporary anicuts or permanent anicuts and reservoirs/tanks, to the point where it is used for agriculture and industrial or domestic use. Canals, existing rivers and streams are used to affect the transportation of water. This process may result in the creation of new wetlands such as rice fields, drainage areas, reservoir areas, etc. It may also be pointed out that Sri Lanka is probably the largest wetland in the world. All its water bodies are man-made in some form, shallow or deep. Preventive actions will result in restricting flows and increasing outflows. Habitat change will result in water regime control. Therefore, these actions have impacts on existing wetlands.

Control activities involve prevention of floods and salt intrusion. Sometimes, natural salt intrusion is caused by tide action. Since we are meddling with wetlands we should give grave consideration to the fact that Sri Lanka is probably the largest wetland in the world with no natural lakes whatsoever.

There are three components to the environmental structure. These are the natural system, the built system and the socioeconomic and cultural system. It is difficult for the natural system to prevail though we like it. There is no place in this planet whose natural conditions have not been directly or indirectly influenced by humans. When we consider an urban system, a built system and a socioeconomic and cultural system take over where the natural system has contracted. When we move away from the urban system, the natural system becomes larger but the influence of socioeconomic and cultural factors do not go away. If we really want to have a totally harmonized sustainable environment in the future, it could only be possible through the fusion (the coming together) of these three components as much as possible. Today, these three components are polarized. Therefore, the objective of this presentation is to examine how to bring the three together. This aspect has not been considered before, and what we have done in irrigation so far is to interfere with the natural system.

There are a number of positive as well as negative impacts of irrigation. The negative impacts are loss of habitats (forest and aquatic); loss of species (terrestrial and aquatic); loss of life style (river, stream, wetland, migrant and land); micro-climatic effects (increase in humidity, changes in phenology); habitat change (salinity, chemical balance); excess water/drainage; methane emissions (contributing to green house gasses); loss of aesthetics (waterfalls) and health hazards.

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The positive impacts are environmental amelioration (increase in humidity, availability of water in soil, water balance table); enrichment of habitat/increase in species diversity; and enhancement of socioeconomic conditions and aesthetic values.

One needs to "think environmentally" to realize the positive goals when undertaking irrigation projects. If one does something natural, nature will look after it and it will maintain itself. Why can't we make rivers instead of canals which provide environment friendly conditions? Planning has to be multi-dimensional and not of a "plain table" format as practiced in the past. Site specificity must be considered and emphasis must be placed on landscape design to achieve benefits with least changes and impact on the existing conditions which are not dependent upon reconstruction. It must be noted that the efficiency in design and construction should not be to maximize profit for the present, but to optimize benefits for the future. Therefore, it can be concluded that environmentally sound development is based on compromise and sacrifice of the present, but not the future. Thus, it is advisable to think ecologically.